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PROCEEDINGS

OF THE

ZOOLOGICAL SOCIETY

OF LONDON.



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PART XXVIII.

1860.

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CONTRIBUTORS,

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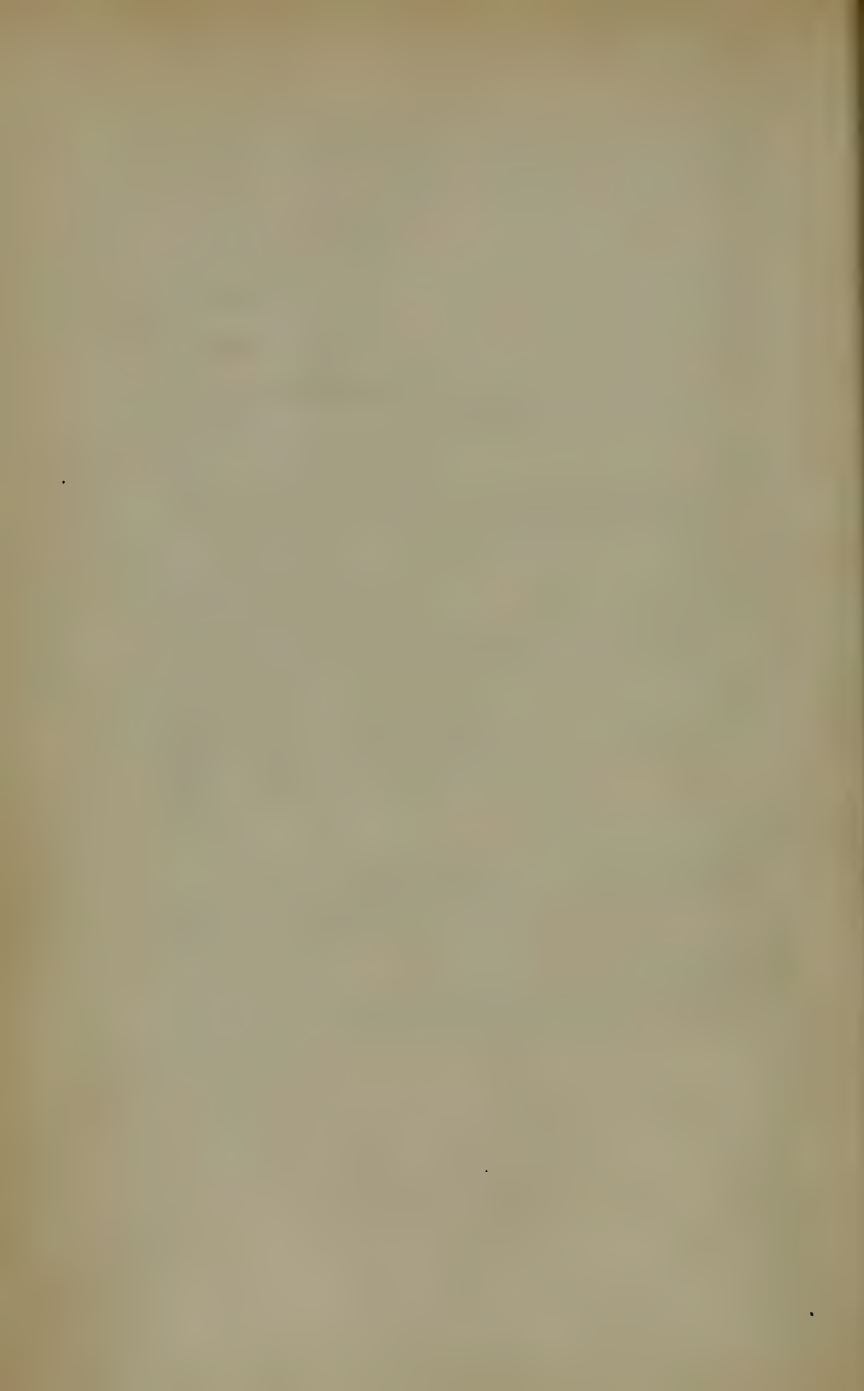
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THE SQUIRREL

SCIENTIFIC ILLUSTRATION



PROCEEDINGS  
OF THE  
ZOOLOGICAL SOCIETY OF LONDON.

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January 11th, 1860.

Dr. Gray, V.P., in the Chair.

Dr. Hamilton exhibited some remarkably fine and large specimens of hybrids between the Pheasant (*Phasianus colchicus*) and the hen of the Domestic Fowl.

Mr. S. Stevens exhibited a series of the birds and lepidopterous insects contained in Mr. Wallace's recent collections from the island of Batchian. Mr. G. R. Gray was stated to be preparing a list of the birds, recognizing eighty-five species, of which about twelve appeared to be undescribed.

The following papers were read:—

1. DESCRIPTION OF A NEW SPECIES OF CUSCUS (*C. ORNATUS*) FROM THE ISLAND OF BATCHIAN, WITH A LIST OF THE MAMMALIA COLLECTED IN THAT ISLAND BY MR. A. R. WALLACE. BY DR. JOHN EDWARD GRAY, F.R.S., V.P.Z.S., PRES. ENT. SOC., ETC.

(Mammalia, Pl. LXXIV.)

Mr. Wallace has sent to the British Museum a series of Mammalia collected in the island of Batchian in the year 1859.

The most interesting specimen is a new species of the genus *Cuscus*, belonging to the section of the genus which has the inner surface of the ears bald. It may be thus described:—

*CUSCUS ORNATUS* (Pl. LXXIV.).

Male pale golden-brown; back rather darker, with small irregular white spots; crown and back with a narrow longitudinal blackish

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streak, which is darker on the back, black on the crown, and indistinct on the nape; beneath rather paler, with a broad white longitudinal streak near the middle of the chest and front of the abdomen; ears produced beyond the fur, naked internally; the skull with a very deep concavity between the orbits.

*Hab.* Batchian.

This species is most like *Cuscus orientalis*, but in that animal the male is pure white. It differs entirely from *C. celebensis* (from Celebes) in the general colour of the fur, and in having a distinct streak on the head and back, somewhat like the streak on the back of the female *C. orientalis*, but narrower and darker.

It differs from all the other species in the nakedness of the inner surface of the ears.

The white streak on the chest and belly is not exactly in the middle of those parts, and there is a square white spot on the upper part of the right fore leg, not found on the other legs.

This animal may possibly be the coloured male of *C. orientalis*; but all the known males of that species are pure white. Can albinism be the usual, and this coloured male the unusual, characteristic of that species?

The skull of Mr. Wallace's animal from Batchian agrees in general character with the skull of *C. orientalis* (sent to the Museum as *Cuscus quoyii* from the Moluccas), but is yet sufficiently unlike to render it very doubtful if it be not a distinct species. It is smaller, the impression on the crown is deeper and furnished with a much more decidedly raised edge, which is extended behind on the central line to the occiput, and there is a notch or ridge at the upper front angle of the orbit, not to be found on the skull of *C. orientalis*.

Some of the converts to the theory of the mutation of species may think that this animal is an instance in point; but such a hypothesis derives no support from the observations I have made.

All the difficulties here started arise from the imperfect material which the specimen affords for arriving at any definite opinion on the subject, and I believe that this is the explanation of nine-tenths, or I may say ninety-nine in a hundred, of the cases on which the theory is attempted to be established. This is not to be wondered at when we consider how very few are the animals, even of our own country, and more especially of exotic species and genera, whose history and anatomy have been properly studied. Most naturalists are of necessity in the habit of describing species from the few specimens which are brought from abroad in a more or less perfect state, without being acquainted with the changes which the animal undergoes in growing from its birth to maturity, and without the slightest indication of its habits and manners. Now, we know from experience amongst the British birds, such as for example the Rook and the Crow, and the species of the Willow Wrens, that if we were called on to describe them from such materials we might make great mistakes. A mere examination of stuffed specimens might well lead to doubts as to their distinctness as species, but this could never be the case if we had seen them alive in their native haunts, and

observed the extreme differences which exist in their habits, food, note, &c.

Judging from analogy, it is fair to believe that many of the species, even among the larger and best known vertebrated animals, which are now considered doubtful, and sometimes only regarded as slight varieties, if properly observed and described, would prove to be quite distinct; and if this be the case with the larger animals, what must it be with the smaller articulated and molluscous or radiated animals, which are very rarely described, except from specimens in one condition, often indeed from some isolated part of the animal, as its shell or coral, as it is found in a museum? I cannot but think that until we have better materials to work from, it is rather rash to theorize on so important a question as the stability or mutability of species.

As regards the animal now before us, instead of knowing its history in all its states, and having a full account of its habits and manners (and I cannot conceive that any species is well established without all these particulars), we have only a skin with its separated skull, and that of one sex, of a genus in which the sexes sometimes differ greatly in external appearance, and of which the species are very imperfectly known.

Thus, for example, the section of the genus to which this specimen is referable contains at present two species; one long known, and of which perhaps there are not more than twenty-five or thirty specimens in all the museums in Europe. The males in all these cases are pure white, and the females reddish with a narrow dorsal streak.

Last year I described a second species from a male, a female, and a young specimen in the British Museum, in which both sexes are ashy-grey without any dorsal streaks, and which has not been observed in any other collection. Now I have described a third from a single adult male, which is bright reddish-yellow varied with white spots, having a very distinct narrow dorsal stripe. I have every reason to believe that this is a good and distinct species, but without stronger evidence I can hardly say that it is so, particularly as I have no knowledge of the female. Moreover, all the males of the species most nearly allied to it in the different museums are pure white, a colour which is very rare in the animal kingdom, except when it arises from a state of albinism; and the eyes of this animal are represented in the published figures as red, as if it were an albino; and this male specimen has a distinct dorsal streak, which is the character that distinguishes the female of *C. orientalis* from the other species of the genus. I am therefore induced to inquire, can the males which we have hitherto had have been albinos? and is this the naturally-coloured male of that species? And though I ask the question in order to induce other naturalists further to examine the subject, I am myself inclined to regard *C. ornatus* as a distinct species. Whether this be the case or not, I do not think that this specimen affords any ground for believing that the three species of the genus were derived from a common origin, and have gradually separated themselves from each other, more especially as they all seem to be

organized on very much the same plan, and are confined to a very limited space or group of islands on the earth's surface.

With this animal Mr. Wallace has sent

1. *CYNOPITHECUS NIGRESCENS.*

*Papio nigrescens*, Temm. Consp. &c. iii. 111.

Three specimens (with their skulls), two adult and one young.

The adult agrees well with the specimen which the British Museum received from the Leyden Museum as coming from Celebes. The younger specimen wants the pale subterminal ring on the longer hairs of the shoulder, which are more or less distinctly marked in all the adult specimens I have examined. This species is very nearly allied to the *C. niger* of the Philippines.

Mr. Wallace, in a note, remarks, "These apes are very rare and, I think, very interesting, as I expect they are from the most southern limits for these animals."

I think there must be some mistake in this, because, first, they are more Monkeys than Apes; and secondly, both Monkeys and Apes are found abundantly in Sumatra and Java, much further southwards than Batchian, which is nearly on the equator.

The Bats seem numerous on the island, as the collection contained fifty-nine specimens. I have not ventured to name or describe them, as Mr. Robert Tomes has now taken up this group of animals, and promised to form a catalogue of them; so I leave their determination to him.

2. *RHINOLOPHUS*, no. 1.

3. *RHINOLOPHUS*, no. 2.

4. *RHINOLOPHUS*, no. 3.

These species differ greatly in size and colouring.

5. *HIPPOSIDEROS*, no. 1.

6. *HIPPOSIDEROS*, no. 2.

The second species is the smallest of the group I have yet seen.

7. *MINIOPTERIS AUSTRALIS.*

Peculiar for the great length of the tail and infemoral membrane, and for the length and freedom of the hind feet.

8. *PTEROPUS*, no. 1. (Seven specimens.)

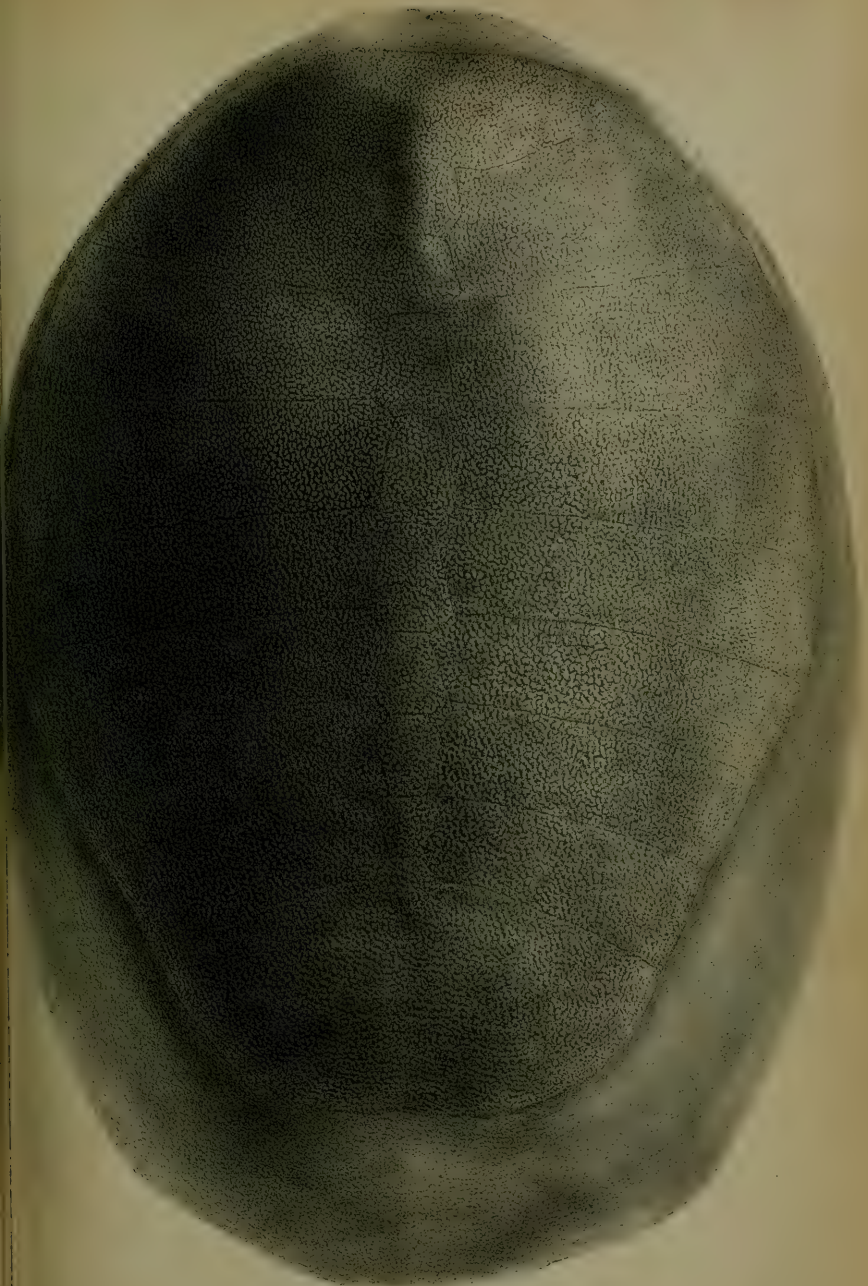
9. *PTEROPUS*, no. 2. (Five specimens.)

10. *PTEROPUS*, no. 3. A single specimen, of a uniform reddish-brown, rather paler on the head.

These species differ greatly in colour, and they appear to be very uniform, as there are many specimens of nos. 1 and 2, and the individuals are much alike.











## 11. VIVERRA ZEBETHA, Linn.

*Hab.* Batchian. A young male.

Mr. Wallace names this animal *Paradoxurus*, but it has none of the characters of that genus: the scrotum is covered with hair, and the tail uniformly hairy.

## 12. BELIDEUS ARIEL.

*Hab.* Batchian.

Two males, rather differing in size and colour: the larger is darker and greyer, the smaller paler and redder on the back.

2. DESCRIPTION OF A SOFT TORTOISE (*ASPIDOCHELYS LIVINGSTONII*) FROM THE ZAMBESI, SENT TO THE BRITISH MUSEUM BY DR. LIVINGSTONE. BY DR. JOHN EDWARD GRAY, F.R.S., V.P.Z.S., PRES. ENT. SOC., ETC.

(Reptilia, Pl. XXII.)

The British Museum has lately received from Dr. Livingstone the dorsal and sternal shields of a large fluviatile Soft Tortoise from the country near the Zambesi. It was accompanied by the skull of a foetal African Elephant, and some other bones of that animal.

Some years ago I received through the Earl of Derby a Soft Tortoise from the River Gambia, which differed from the genus *Emyda*, to which it was allied, in having no bones on the hinder part of the margin of the dorsal shield. I, therefore, proposed to establish for it a new genus.

When I described this genus I called it *Cyclanorbis*, but received a note from Dr. Peters, before the account of this genus was printed, in which he informed me that he had found near Mozambique, on the River Zambesi, a Tortoise which was called *Casi*, which wanted these bones on the hinder part of the margin of the dorsal shield, and which he had proposed to call *Cyclanosteus frenatus*, on account of certain black streaks on the head. I obliterated my name, and adopted that which my friend Dr. Peters has suggested, and described the one I had received from the Gambia under the name of *Cyclanosteus petersii* (Proc. Zool. Soc. 1853; Ann. & Mag. N. H. 1855, xv. 69; Catalogue of Shielded Reptiles in the British Museum, 64, t. 29).

The animal from the Zambesi which we have received from Dr. Livingstone agrees with the animal from the Gambia in wanting the bones in the hinder part of the margin of the dorsal shield; but it differs so essentially in the structure of the sternum that it is necessary that another genus should be established for its reception. Now, it may be the *Casi* of the natives, but unfortunately Dr. Livingstone has not sent its native name, and it may be the *Cyclanosteus frenatus* of Dr. Peters; but I cannot find any description of that animal. It is not noticed, nor any other Tortoise, in the review of the Amphibia collected during his Travels, which Dr. Peters

published in the 'Monatsberichte der Berliner Academie,' 1854, p. 614, and which is reprinted in Wiegmann's Arch. 1855, p. 43. Under these circumstances, as I applied Dr. Peters' name *Cyclanosteus* to the animal from the Gambia, and first gave the character to that genus derived from that species, and, as my description of that genus appears to be the only one that has been published, I think that the name *Cyclanosteus* must be retained for the Gambian Tortoise, although probably Dr. Peters in his note intended it to refer to the Mozambique form. If I do so, the reference to Dr. Peters' MS. must be erased from my account of the animal in the papers above referred to, and I must give a new name to the genus, to be established on the Tortoise from the Zambesi.

This genus may be considered in some respects intermediate between *Cyclanosteus* and *Emyda*; for, though it has the simple flexible boneless hinder margin of the dorsal shield of the former genus, it has the seven sternal callosities of the latter; but these callosities, though they agree in number, are of a much smaller size, compared with the size of the animal, than those of the genus *Emyda*.

It is the giant of the group, agreeing in size and development with the genera of this family, which have the legs exposed, and especially with the genera *Trionyx* and *Chitra*.

#### ASPIDOCHELYS.

Head — ? Limbs — ? The hinder margin of the dorsal disk expanded, flexible, without any bony plates. The sternum broad, rounded before and behind, hiding the feet, with very distinct moveable flaps over the hinder feet. Sternal callosities 7, the odd one behind the oblong anterior pair, lunar, transverse, the hinder pair large, oblong, only united together on the hinder part of the inner margin.

*Hab.* Africa.

ASPIDOCHELYS LIVINGSTONII (Pl. XXII. fig. 1, 2).

? *Cyclanosteus frenatus*, Peters, MSS. in Gray, Cat. Shielded Reptiles Brit. Mus. p. 64.

*Hab.* Mozambique in tributaries of River Zambesi? (*Dr. Livingstone*).

The dorsal shield is 22 inches long and 17 inches wide over the convexity of the back.

#### 3. ON THE MOLLUSCA OF SIAM. BY DR. EDUARD VON MARTENS. (COMMUNICATED BY DR. A. GÜNTHER, FOREIGN MEMBER.)

During my stay in London I have had the opportunity of examining several collections of Siamese shells made by Sir Richard Schomburgk, J. C. Bowring, Esq., Dr. Harland, and Mr. Mouhot.

The greater number of them are in the collection of the British Museum. Like all naturalists visiting this country, I feel myself under great obligations to Dr. J. E. Gray and to H. Cuming, Esq., who with their usual liberality have given me free access to their collections.

### I. LAND-SHELLS.

The only notice of a Siamese land-shell recorded by earlier authors is to be found in Argenville's 'Conchyliologie,' third edition, by Favanne, figure C 1 of plate 64 of this work representing a shell called *la Siamoise*, which it is difficult to indentify with any known species; Nicolson (Essai sur l'Histoire Naturelle de l'isle de St. Domingue, 1776) and Lamarck are very probably wrong in quoting it as a Haiti shell, *Helix undulata*, Fér. From that time, so far as I know, no land- or freshwater-shell has been mentioned as from Siam, until the shells collected by Dr. House were described by Redfield and Haines (in the sixth volume of the Annals of the Lyceum of Natural History at New York, 1853-1855) and by Dr. Pfeiffer (in the Proceedings of this Society, 1856). I shall mention them in the following list at the proper place.

#### HELICEA.

VITRINA SIAMENSIS, Haines, Ann. Lyc. N. H. New York, 1855, vi. p. 158.

Diam. maj. 30, min. 25, alt. 15 mill.

Leg. House.

NANINA DISTINCTA. Pfr. Mon. iii. p. 81; Reeve, Conch. Ic. Hel. no. 465.

Leg. House et Mouhot.

This species and *Cyclophorus siamensis* are the largest land-shells known at present from Siam; it seems to be common there, because there are several of this species among the shells collected by Mouhot, and Dr. Pfeiffer had seen and described one some years before House or Mouhot were in Siam.

NANINA BIRMANA, Pfr.

Pale yellowish, with a reddish band, the whorls slowly increasing.

Diam. maj. 26, min. 23, alt. 15 mill.

Leg. Mouhot.

NANINA HAINESI, Pfr. Mon. iv. p. 61; Novitat. pl. 18. f. 7-9.

This shell is similar to the preceding, but may be distinguished by the whorls being more raised, and by the want of any band. They are both faintly decussated, and their suture is slightly crenulated, and of a pinkish-violet hue.

Diam. maj. 30, min. 26, alt. 16 mill.

Leg. House et Mouhot.

## NANINA — ?

There is another Siamese species in the British Museum most allied to *N. bistrialis*, but distinguished from it by being more flat above; the whorls are much more rapidly increasing, as in the two preceding species; the colour is pale yellowish with a rather broad white band, bordered on each side by a narrow brown line. As the specimen seems not to be perfect, I shall not venture to give it a new specific name.

Diam. maj. 20, min. 17, alt. 17 mill., anfr.  $4\frac{1}{2}$ .

*Leg.* Mouhot.

NANINA SIAMENSIS, Pfr. Mon. iv. p. 60; Novitat. pl. 18. f. 1, 2.

*Leg.* House.

NANINA (subg. HESTA) VALLICOLA, Pfr. Mon. iv. p. 46.

Whorls  $5\frac{1}{2}$ , with radiating striæ near the suture.

Diam. maj. 12, min. 11, alt. 7 mill.

NANINA (subg. HESTA) SPLENDENS, Hutt., Pfr. Mon. iv. p. 124?

Umbilicus very narrow.

Diam. maj. 13, min. 11, alt. 7 mill.

*Leg.* Bowring.

The two last-mentioned species are very brilliant, and in this respect, as well as in their size and general shape, resemble the shells of the genus *Hyalina* more than any true *Nanina*. It is merely on the authority of Hutton and Pfeiffer (*v.* Malakologische Blätter, 1856) that I am induced to place them in the genus *Nanina*.

NANINA (subg. TROCHOMORPHA), sp.

There is one specimen in the British Museum, gathered by Mr. Bowring, nearly allied to *Helix planorbis*, Less., and *H. acutimargo*, Pfr. As Mr. Cuming tells me that he has sent specimens of all these Siamese land-shells to Dr. Pfeiffer, I prefer to await the judgment of that experienced monographer in determining the species.

HELIX TOURANNENSIS, Eydoux et Souleyet, Voy. Bonite, pl. 29. f. 12; Pfr. Mon. iii. p. 137.

HELIX SIMILARIS, Fér.; Pfr. Mon. i. p. 336.

A rather large specimen, diam. maj. 18, min. 15, alt. 12 mill., with a distinct reddish-brown band.

HELIX PTYCHOSTYLA, n.

*Testa umbilicata, conoidea, solidiuscula, striata, fusca; anfr.  $6\frac{1}{2}$ , convexiusculi, lente accrescentes, ultimus medio carinatus, basi convexus, umbilico lato, pervio; apertura securiformis; peristoma expansum, album, margine columellari fere perpendiculari, uniplicato, angulum rectum cum margine basali formante.*

Diam. maj. 14, min. 12, alt. 9 mill.

Nearly allied to *H. tupeina*, Bens., from which it may be at once distinguished by the fold on the columella.

**BULIMUS PERVERSUS, L.**

I have seen two imperfect specimens only, collected by Mr. Mouhot; they may be recognized by the convexity of the upper whorls and the white sutural zone as belonging to *B. perversus*, and not to *B. interruptus*.

**BULIMUS SIAMENSIS**, Redfield, Ann. Lyc. N. H. New York, 1853, vi. p. 15; Pfr. Mon. iv. p. 425.

*Leg.* Ingalls et Mouhot.

Our specimens would scarcely be called "obtuse carinati," having in fact no keel at all. The largest of the specimens which I have seen is 22 mill. long and 11 broad, the length of the aperture being 8 mill.

*B. siamensis* belongs to the group *Ena*, Leach (= *Merdigero*, Held = *Napæus*, Alb.), spread from the middle of Europe to the northern and mountainous parts of India, and seems to be one of its most eastern representatives; it is particularly allied to the Transylvanian *B. reversalis*, Bietz., by its sinistral whorls.

**STENOGYRA ERECTA (Bens.); Pfr. Mon. ii. p. 265?**

I am not able to find any reliable difference between one shell collected by Mr. Bowring and the above-quoted description; as the measurements, however, and the number of whorls do not agree, I subjoin the following diagnose:—

*Testa cylindraceo-turrita, apice obtusa, striatula, nitida, pallide lutescens; sutura mediocris; anfractus 5½ convexiusculi; apertura ¼ longitudinis testæ æquans, tetragono-elliptica; peristoma simplex, acutum; columella antrorsum torta, oblique truncata.*

Long. 24½, diam. 9 mill.; apert. 8 mill. longa, 5 lata.

**STENOGYRA TURRICULA, n.**

*Testa turrita, imperforata, subtiliter verticaliter striata, parum nitens, sordide flavescens; apex obtusiusculus; anfr. 9, regulariter accrescentes convexi, sutura profunde discreti, ultimis angustatus; apertura ovato-lanceolata, superne acuta, inferne rotundata; peristoma simplex, margo externus strictus, rectus, columellaris adnatus; columella stricta, elongata, alba, ad basin valde oblique truncata.*

Long. 18, diam. 6; long. apert. 5 mill.

**SUCCINEA, sp.**

*Leg.* Mouhot.

The specimens are too badly preserved to be identified with any known species, or described as a new one.

## CYCLOSTOMACEA. 1

## CYCLOTUS CONICUS.

*Testa conico-turbinata, late umbilicata, sub epidermide sordide brunea aureonitens, spiraliter lirata; apex acuminatus; anfr. 5, convexi, sutura profunde discreti, ultimus rotundatus, liris 8-9 elevatis, mediana nigricante, piligera, basi lævi; apertura circularis; peristoma duplex, internum rectum, album, continuum, margini columellari appressum, externum interruptum, breviter expansum, nigricans. Operc. typicum.*

Diam. maj. 10, min. 8, alt. 10 mill.

This species comes next to *C. tourannensis*, Souleyet, from Cochin China, but is distinguished from it by the sculpture, by the haired keel, and by the higher form of the shell.

*Leg.* Bowring.

## OPISTHOPORUS SIAMENSIS, n.

*Testa discoidea, late umbilicata, striatula, flavida, fusco-fulgurata, vertice prominulo; anfr. 4½, convexiusculi, sutura profunda discreti, ultimus rotundatus, antice descendens, non solutus, linea mediana pilifera, tubulo recurvo aperto 6 mill. pone aperturam munitus; apertura circularis; peristoma duplex, internum rectum, continuum, externum interruptum, breviter expansum, superne alatum dilatatum. Operculum calca-reum, multispirum, planum, margine incrassato, cavo.*

Diam. maj. 19, min. 14, alt. 7 mill.

*Leg.* Bowring.

Allied to *O. biciliatus*, Mouss. and *O. euryomphalus*, Pfr.

PTEROCYCLOS (subg. SPIRACULUM) HOUSEI, Haines, Ann. of Lyc. N. H. of New York, Oct. 1855, vi. p. 157, pl. 5. f. 12-15; Pfr. Suppl. p. 29.

In this species the end of the last whorl is separated from the preceding; the operculum is remarkable from its cylindrical form.

*Leg.* House.

ALYCÆUS DISTORTUS, Haines, *l. c.* pl. 5. f. 5-8; Pfr. Suppl. p. 33.

*Leg.* House.

CYCLOPHORUS SIAMENSIS, Sow. Thes. Suppl. pl. 31 A. f. 292, 293; Pfr. Mon. p. 66; Gray, Cat. Cycl. p. 37.

*Operculum cartilagineo-corneum, multispirum, crassiusculum, extus concavum, albidum, intus aurantium, nucleo centrali, mammillato, sanguineo.*

In our specimen the last whorl is rather subangulated.

*Leg.* Bowring.

CYCLOPHORUS FLORIDUS, Pfr. Proc. Zool. Soc. 1854, p. 300; Mon. Pneumonop. Suppl. p. 43.

*Leg.* House.

The figure 115 in Sowerby's 'Thesaurus' agrees more with this shell than with *C. involvulus*, Müll., from which *C. flavidus* is distinguished by the want of the spiral ribs, and by having the peristome not double, and coloured white.

*CYCLOPHORUS PUNCTATUS*, Grateloup; Pfr. Mon. p. 67; Gray, Catal. Cycl. p. 45.

Diam. maj. 24, min. 21, alt 19 mill.

Leg. Bowring.

*MEGALOMASTOMA MYERSII*, Haines, l. c. pl. 5. f. 9-11; Pfr. Suppl. p. 79; Novitat. Conch. pl. 18. f. 12.

Long. 36-39 mill.

Leg. House.

#### *OMPHALOTROPIS MACULATUS*.

*Testa ovato-conica, acuta, striatula, parum nitens, olivacea, maculis fuscis triseriatis notata; anfr. 8½, planiusculi, sutura minime profunda discreti, ultimus ovatus; apertura oblongo-ovata, superne valde attenuata, acuta, peristomate simplice, margine externo parum arcuato, recto, acuto, columellari breviter expanso; umbilicus pervius, angustus, carina alba, fuscolimbata cinctus.*

Long. 11, diam. 7, alt. apert. 6 mill.

The outlines of this shell are somewhat similar to those of *Assimineea francisci*, Wood, sp. I retain the name *Omphalotropis*, for which Pfeiffer has substituted "*Hydrocena*" in the Supplement of his 'Monographia Pneumonopomorum,' because I am by no means persuaded that the Eastern species with a keel round the umbilicus, and with a subvertical aperture, belong to the same genus as *Hydrocena cataroënsis*, Pfr., found in Dalmatia.

Most of the species enumerated above have as yet been found only in Siam; but several are spread over a great extent of the large eastern peninsula, containing Birma, Assam, Siam, and Cochin China, as for instance, *Nanina birmana*, *Helix tourannensis*; a few others seem to extend beyond the peninsula to the neighbouring parts of India and China; but we may remark that these are species belonging to groups which are spread over most parts of the world, and which consist of species to be distinguished from each other only by the vague characters of size and proportions.

The most striking natural groups represented in the fauna of Siam, as far as at present known, are exactly those which predominate in and are characteristic of the whole Indo-Chinese region and the adjacent islands, as *Cyclophorus* among the *Cyclostomacea*, *Nanina* and the great helicoid *Bulimus* (*Amphidromus*) among the *Helicea*. *Bulimus siamensis* is the only representative of a group which is confined to the continent, and is wanting, as far as I know, in the Eastern Archipelago.

## II. FRESHWATER SHELLS.

## LIMNÆACEA.

PLANORBIS COROMANDELICUS, Beck ; var. *minor*, Dunker in Trüster's second edition of Martini's Conchylien.-Cabinet, pl. 6. f. 14-16.

Diam. maj. 14, min. 11, alt. 8.

The specimens sent by Dr. Harland and Mr. Mouhot agree very well with the figure quoted above. It is another question, which, however, need not be discussed here, whether they should really be regarded as a variety of *Planorbis coromandelicus*, which is much flatter. These shells are very remarkable for their resemblance to those of the North American group allied to *P. trivolvis*, Say, exhibiting the oblique shape of the mouth, and the few inflated whorls with a blunt keel near the umbilicus, which is less deep than the centre of the upper side of the shell.

## AMPULLARIACEA.

AMPULLARIA GLOBOSA, Swains. ; var. *A. corrugata*, Swains.

Peristome orange.

Diam. 63, alt. 59 mill. ; apert. 51 mill. longa, 35 lata.

AMPULLARIA CELEBENSIS, Quoy et Gaimard (*ampullacea* of Linn.?).

Peristome whitish, speckled with dark brown.

Diam. 63, alt. 63 mill. ; apert. 55 mill. longa, 35 lata.

AMPULLARIA POLITA, Desh. ?

Spire conic, produced ; the shell of a uniform black colour ; the peristome whitish.

Diam. 48, alt. 58 mill ; apert. 41 mill. longa, 24 lata.

All these three species I found in the collections made by Mr. Mouhot.

## PERISTOMACEA.

PALUDINA TROCHOIDES, m.

*Testa trochiformis, acuminata, obtecte perforata, oblique striata, striis spiralibus subtilissimis decussata, interdum malleata, nitens ; spira concava ; anfr. 6, supremi plani, nigricantes, mediæ convexiusculi, obscure virides, ultimus medio carinatus, pallide virens, fascia lata fusca supra carinam notatus, basi convexiuscula ; apertura diagonalis, rotundato-cordata ; peristoma breviter expansum, album, margine supero subrecto, columellari incrassato, dilatato. Operculum corneum, concentricum, subovatum, extus rugis subtilibus obliquis sculptum.*

Long. sive alt. 20, diam. 22, alt. apert. 14 mill.

This species is very remarkable from its form resembling that of the trochiform *Helix* of the Eastern Archipelago (of the section *Geotrochus*) ; the structure and the appearance of the surface clearly



indicate its affinity to the other viviparous *Paludina*, especially to the following. The keel, in some of the specimens, becomes almost obsolete near the aperture.

*PALUDINA CINGULATA*, n.

*Testa ovato-conica, acuta, anguste perforata, oblique striatula et lineis spiralibus subtilissimis decussata, virens vel brunneo-nigricans, apice violaceo-nigra; anfr. 6-7, convexiusculi, superiores lineis elevatis spiralibus, nonnullis obsolescentibus sculpti, ultimus cingulo tumido mediano munitus; apertura parum obliqua, ovato-rotunda, superne non acuta, cærulescenti-alba; peristoma rectum, crassum, obtusum, extus sæpius nigricans. Operculum corneum, concentricum, late ovatum, aureo-nitens.*

Long. sive alt. testæ 55, diam. 31, alt. apert. 21 mill. (in specimine maximo).

*Leg. Mouhot.*

This species can be regarded as a link in the chain between *P. oxytropis*, Bens., *P. tricarinata*, Antøn, *P. angularis*, Müll., and our European *P. fasciata*, Müll. (*vivipara* of Linn.). It is distinguished from the latter by the presence of one, from all the former by the absence of the two superior spiral girdles, traces of which, however, are found on the upper whorls. The single girdle is in most of the specimens much swollen, and is visible also on the penultimate whorl, on or a little above the suture. *P. japonica*, mihi, is also closely allied, but its body-whorl exhibits a canthus only instead of an elevated girdle, and its upper whorls no raised lines at all.

*PALUDINA POLYGRAMMA*, m.

*Testa conico-oblonga, imperforata, striatula, fusco-viridis, fasciis nigris numerosis (in anfr. ultimo 9) cincta, apice nigricante; anfr. 5½, subplani, ad suturam tumidi, ultimus obtuse angulatus; sutura impressa; apertura ovalis, superne acuta, cæruleo-albida; peristoma incrassatum, brevissime campanulato-expansum, nigro-limbatum. Operculum normale, concentricum, corneum.*

Long. 20, diam. 14, long. apert. 12 mill.

*Leg. Mouhot.*

*Mus. Berol.*

*BITHYNIA TRUNCATA*, Eyd. et Soul.

*Testa conico-oblonga, rimata, lævis, flavo-virens, apice truncata; anfr. superiores 4½, convexiusculi, sutura simplice discreti, ultimus obsolete fasciatus; apertura oblongo-ovata, superne acuta, margine columellari fusco. Operculum ovatum, extus corneum, concentricum striatum, nucleo subcentrali, intus testaceum, homogenum, margine corneo.*

Long. 13, diam. 8, long. apert. 6 mill.

This species is in shape similar to *Paludina bulimoides*, Olivier (*cleopatra*, Troschel), but it is essentially distinguished by the structure of the operculum; the whorls, also, are more flattened.

## MELANIA, sp.

There is among the shells collected by Mr. Mouhot a turritid species of this genus; its chief character consists in the under margin of the whorls being swollen and prominent over the following suture, in the same manner as in *Turritella imbricata*, Lam. The shell is of a uniform olive-green colour, which becomes in the uppermost whorls reddish: it is provided with rather strong vertical striae. As Mr. Cuming tells me that he has sent specimens of it to Mr. Reeve to be described and figured in one of the next numbers of the 'Conchologia Iconica,' I do not give it any specific name. The same is the case with the two following species.

## MELANIA, sp.

A turritid shell with large dark-brown stripes, a little shorter than the preceding, allied to *M. testudinaria*, Busch, and *M. picta*, Hinds. Leg. Mouhot.

## MELANOPSIS HELENA, MOUSS.

Leg. Mouhot.

NERITINA MELANOSTOMA, Troschel = *Neritine indienne*, Eydoux et Souleyet, Voy. Bonite, 34, 32-35.

Mr. Reeve is wrong in uniting this species with *N. crepidularia*, Lam., from which it differs in the narrower form of the mouth and of the whole shell, and in the blackish colour of the inner lip.

## NAIACEA.

A considerable number of species of the genus *Unio*, found in Siam by Dr. House, are described by Lea in the sixth volume of his 'Observations on the genus *Unio*,' 1857. Several of them are in the collection of the British Museum, sent by Sir R. Schomburgk.

## UNIO HOUSEI, Lea, l. c. pl. 23. f. 3.

This is a flat shell, with a small wing before and a large one distinctly folded behind the summits. Three specimens of different ages, sent by Sir R. Schomburgk, render it highly probable that *U. myersianus*, Lea, l. c. pl. 22. f. 2, is merely the adult of the same species, the wings being gradually lost with age.

Leg. Sir R. Schomburgk.

## UNIO GRAVIDUS, Lea, l. c. pl. 24. f. 5.

Is a very distinct form, not yet known from the Eastern hemisphere, similar to *U. capax* from North America; the wing, nevertheless, shows some wrinkles at its base, which are elevated and anastomosing, as in many of the Eastern species.

Lao in Siam; leg. Mouhot.

## UNIO RUSTICUS, Lea, l. c. pl. 25. f. 7.

As I am not quite confident in identifying our shell with that described by Lea, I shall add a diagnostic phrase.

*Testa ovata, tenuis, virescens, antice rotundata, postice obtuse angulata, margine dorsali postico convexiusculo, ventrali substricto; angulus a vertice decurrens, aream posticam testæ circumscribens; rugæ V-formes in medio testæ, ascendentes in area postica, utræque in adultioribus obsolescentes. Dentes cardinales tenues, compressi, vix crenati; lateralis elongatus, arcuatus, in valva dextra duplicatus.*

Long. 51, alt. 29, diam. 14 mill.; vertices in  $\frac{1}{3}$  longitudinis siti.

The other species described and figured by Lea, *l. c.*, are:—

*Unio hainesianus*.—This is a large, convex, and rounded shell, with the wing well developed and almost rectangular to the longitude of the shell; allied to *U. housei*, *cuningii*, and *schlegelii*.

*Unio eximius*.—This has also a folded wing.

*Unio scobinatus*.—Allied to *U. rusticus*, from the same locality, with the corrugations much more developed.

*Unio inornatus*.—With two oblique keels on the hinder half of the shell.

<sup>4</sup> *Unio tumidulus*.—Similar to the European *U. tumidus*.

<sup>5</sup> *Unio sagittarius*.—Nearly approaching the Egyptian *U. cailliaudi*.

*Unio humilis, substriatus, nucleus*.—Founded on very small, perhaps immature shells.

#### ANODONTA (subg. LAMPROSCAPHA) SCHOMBURGKI, n.

*Testa elongata, antice angustata, postice dilatata, compressa, tenuis, epidermide nitente, virescente tecta; margo dorsalis subrectus, postice in alam humilem longiusculam elevatus; margo anticus et posticus rotundati, angulis nullis distincti, margo ventralis subconcavus; cardo plane edentulus; impressiones musculares modicæ, accessoria antica modica subrhombæ; facies interna violaceo-rubens.*

Long. 82, altitudo ad vertices 27, in parte postica dilatata 38, diam. 15 mill., vertices ante  $\frac{1}{3}$  longitudinis siti.

Misit Schomburgk.

The thin and very flat shell and the want of edges at the margins render it impossible to associate this species with *Spatha rostrata*, and induce us to search for allied forms in the subgenus *Lamproscapha* of Swainson.

#### ANODONTA CALLIFERA, n.

*Testa rotundato-ovata, crassa, epidermide nigricante, margines versus tomentosa; vertices non prominentes, approximati; margo dorsalis antice angulatus, postice convexus, arcuatim descendens; margo posticus perpendiculariter truncatus, anticus et ventralis valde arcuati; cardo callo marginali inflexo, in valva sinistra prominulo, dentiformi, in dextra emarginato-notatus; impressiones musculares anteriores 2, altera (accessoria) minor, reniformis.*

Long. 80, alt. 51, diam. 28 mill.; vertices in  $\frac{1}{4}$  longitudinis.

15 771. SPATHA COMPRESSA, m.

*Testa oblonga, compressa, solida, epidermide nigricante, sericeo-nitente, subtomentosa; umbones parvi, approximati; margo ventralis rectus, margo anticus rotundatus, posticus perpendiculariter subtruncatus; cardo edentulus, in valva dextra callo parvo prominulo munitus, in valva sinistra paulisper emarginatus; impressiones musculares profundæ, anticæ duæ, accessoria magna subquadrata; postica unica, ovata; facies interna cærulescenti-margaritacea, centrum versus flavescens.*

Long. 87, alt. 44, diam. 24 mill.; vertices in  $\frac{2}{11}$  longitudinis siti.

A specimen purchased for the British Museum from a dealer, together with other Siamese shells, is noted as coming from "Khao-kho, north-east of Pakprian in Siam."

*Spatha* is regarded by most authors as a genus peculiar to the African region; but there is besides the above, another species in the British Museum marked as coming from Manilla, and allied as nearly to *Spatha rubens* as *Spatha compressa* is to *S. wahlbergi*.

Deshayes, in the second edition of Lamarck's work, points out the depth and size of the muscular impressions, and more particularly of the accessory one on the fore half of the valve, as the only character by which the shell of *Spatha* might be distinguished from that of *Anodonta*. This character, coinciding with the very striking resemblance to the South African species of *Spatha*, named above, leaves me no doubt that this shell should be placed in the same genus.

CYRENA (subg. CORBICULA) ORIENTALIS, Lam. Desh. Cat. Brit. Mus. p. 227?

Shell much swollen, subequilateral, with regular distant elevated ribs, gradually becoming obsolete on the hinder end; umbones very blunt, thick, in great extent decorticated. Teeth of the hinge simple, lateral teeth nearly equal in length, curved and striated through the whole of their length.

Alt. 20, long.  $21\frac{1}{2}$ , diam. 16 mill.

### III. SEA-SHELLS.

We find in the above-named work of Favanne two species with the epithet "*Siamoise*," namely, vol. ii. p. 9, "*la Couronne Siamoise*," without figure; according to the author's words, nearly allied to *Turbo argyrostomus*, L., but distinguished by seven rows of thick and elevated girdles. The other, *ibid.* p. 274, "*la Naticæ Siamoise*," pl. 11. f. D 5, appears to be *Natica lineata*, Lam. It should be stated that Favanne mentions China, not Siam, as the locality of both of them; but we may conclude, from the French names quoted above, which, without doubt, were then used in the collections of the amateurs, that those shells were originally brought from Siam to France.

We cannot say the same of the "*Siamoise à collier*," the account of which immediately follows that of the above species of *Natica*,

the name being evidently employed in this case as a generic one, signifying a shell of the kind of the *Siamoise*, distinguished by a collar; and indeed the description of it seems to be made from a specimen of *Natica collaria*, Lam., which occurs in the Atlantic Ocean only. Lamarek, I suppose, intended to call to recollection the above denomination of ante-Linnean conchologists by the specific name given by him. At the close of the past century Brugière introduced the *Conus siamensis*, which is admitted generally as a distinct species, the geographical range of which, however, extends far beyond the limits indicated by the name.

The following are the few Sea-shells from Siam which I observed in the collections of Mr. Mouhot:—

CERITHIUM OBTUSUM, Lam. Zoology of Samarang, pl. 13. f. 3.

NATICA MACULOSA, Lam.; Reeve, Conch. Ic. f. 57.

CYPRÆA ARABICA, L.

MYTILUS SMARAGDINUS, Chemn.

ARCA NODIFERA, n.

*Testa ovata, ventricosa, æquivalvis, parum inæquilateralis, superne utrinque obtuse angulata, margine ventrali medio stricto, utrinque rotundato; costæ 21 distantæ, angustæ, nodosæ; interstitia latiora, concentrice striata; color albidus, zonis nonnullis fusciscentibus; margo grosse crenatus; area ligamenti angusta, striis divergentibus sculpta; vertices parvi, remoti.*

*Hab.* Bangkok; legit Mouhot.

This species is allied to *A. granosa*, Lam. (Reeve, Conch. Icon. fig. 15), which is found also in the East Indies: it is distinguished from it by the shell being more elongated, and by the ribs, which are narrower, and separated by grooves broader than the ribs themselves.

I have examined three specimens, two of them in the British Museum; they are somewhat different from each other as to the outlines of the shell, and I therefore give measurements of them:—

	<i>a.</i>	<i>b.</i>	<i>c.</i>
Length . . . . .	59	50	52 mill.
Height from the summits to the ventral margin	42	35	36 „
Diameter from one valve to the other . . . . .	33	32	32 „

CYTHEREA (MERETRIX) ZONARIA, Lam.; Desh. Cat. Brit. Mus. Venerid. p. 38.

CYTHEREA (MERETRIX) IMPUDICA, Lam. *l. c.* p. 36.

*Leg.* Sir Richard Schomburgk.

The posterior area of the shell is in some specimens more purely white than the remainder, which is somewhat yellowish, speckled with pure white; in others the shell is bordered by a pinkish-violet stripe on the posterior margin. The interior surface of the former variety is quite white; in the other it is provided with a dark-brown

spot, which is situated just on the margin of the shell, where the exterior stripe terminates.

**TELLINA** (subg. **AREOPAGIA**) **SIAMENSIS**, n.

*Testa ovata, compressa, subæquilateralis, lamellis concentricis confertis et striis radiantibus decussata, antice rotundata, postice carinata, lamellis distantioribus, magis elevatis, sulcis impressis 2 ante carinam sculpta; flavescenti-alba, haud nitens; margo ventralis modice arcuatus, postice valde ascendens et subinde subsinuatus; dentes cardinales valvæ dextræ duo, posterior bifidus, valvæ sinistræ duo, prior bifidus, posterior parvus; dentes laterales in utraque valva anticus et posticus distincti, triangulares, a cardinalibus remoti; facies interna alba, sinus palliaris maximus.*

Long. 49, alt. 33, diam. 14 mill.; vertices in  $\frac{1}{2}$  longitudinis siti.

This shell is allied to *Tellina capsoides*, Hanley, and *T. concentrica*, Gould, but it can at once be distinguished by its form being transversely ovate and nearly equilateral, like that of *T. pristis*.

**CAPSELLA VIOLACEA**, Reeve?

The Siamese shell is rather stronger than is usual in this species; long. 63, alt. 31, diam. 19 mill.; vertices in  $\frac{2}{3}$  long.

**SOLETELLINA TRUNCATA**, Gmel.?

I have seen only a worn specimen, the end of which was less truncate than is usual in this species; Mr. Cuming therefore thinks it distinct.

4. DESCRIPTIONS OF NEW SPECIES OF MOLLUSCA FROM THE SANDWICH ISLANDS. BY W. HARPER PEASE. (COMMUNICATED BY DR. J. E. GRAY.)

Before commencing my descriptions, I should remark that I call the hinder part of the shell (near the apex) the posterior end. Being accustomed to see the animal in connexion with the shell in motion, it appears to me unnatural to call the mouth posterior and the apex anterior, as some authors do.

I begin with the Opisthobranchiates, the *Bullidæ*, and so on through the Nudibranchiates. There is no part of my collection with which I am so little acquainted as the *Bullidæ*, having received but few specimens for comparison, and therefore relying mostly on descriptions for the determination of species. I am often misled by these, in such cases, for instance, as where an author makes use of the term *striæ* to mean raised lines, having always considered that *striæ* indicate quite another character from raised lines. Again, descriptions are drawn up from imperfect specimens, and are copied into monographs without alteration or correction.

Of *Bullina vitrea* I have lately procured the two largest and most

perfect specimens I ever found. It does not agree with the *Bullina*, but I can place it nowhere else, unless with the *Hydatinae*.

*Bullina lauta* I have always considered heretofore the same as *B. undata* (Brug.); but on close examination I find differences sufficient to warrant a separation. With a glass can be traced the longitudinal lines crossing the transverse ribs. The ribs of *B. undata* are described as smooth, and the interstices punctured transversely, which does not agree with my shell. In *B. lauta* the apex is more obtuse, and the transverse red lines are *regular*, in which respect also it differs from *B. undata*. The localities of the two shells are wide apart, and I have never received a single specimen from the islands south of the Sandwich, nor ever heard of its having been found on them.

*Tomatina sandwicensis* seems to approach *T. gracilis* (Adams). It is, however, striated transversely.

I have another species of *Haminea* which cannot be distinguished from *H. crocata*; but, not having had an opportunity of examining the animal, I must defer its description.

*Atys debilis* approaches *A. elongata* of Adams, but does not agree with his description in several particulars.

The *Bullidae* are found principally at one locality on the Sandwich Islands, where I have collected but one season.

#### 1. BULLINA VITREA.

Shell ovate, thin, fragile, white, with or without one or two sets of two or three fine transverse black lines on body whorl, transversely finely grooved; interstices punctured; spire obtuse; apex acute; whorls four; aperture oval, dilated at the base; slight fold at the base of the columella (not imperforate, umbilicated).

*Mus.* Cuming.

#### 2. BULLINA LAUTA.

Shell oval, umbilicate, white, with two transverse red lines on body whorl, crossed by irregular longitudinal pink undulating lines, transversely ribbed, crossed by fine longitudinal raised lines; whorls four; spire a little elevated, *nucleus persistent*; aperture elongately oval; columella obliquely truncated.

*Mus.* Cuming.

#### 3. TORNATINA SANDWICENSIS.

Shell small, cylindrical, shining, white, finely striated transversely; spire elevated; whorls four; aperture contracted posteriorly, dilated anteriorly; slight fold on columella.

*Mus.* Cuming.

#### 4. HAMINEA CROCATA.

Shell suboval, thin, fragile, slightly narrowed posteriorly, smooth, with the exception of the longitudinal lines of growth; outer lip slightly produced posteriorly, and rounded; aperture narrowed poste-

riorly, and slightly dilated at the base ; columella with a light fold, white and shining.

*Animal*.—Cephalic disc large, oblong triangular, entire in front and truncated, bilobed posteriorly and lobes overlapping ; lateral lobes reflected on the sides of the shell during locomotion, covering about one-half of its length, and nearly meeting on the back ; posterior lobe covering the spire ; foot subquadrate, extending a short distance beyond the shell posteriorly ; eyes central, immersed, black, surrounded by white areolæ ; colour of the animal varying from grey to greyish-yellow, and in some nearly to black, being closely mottled and freckled with olive or dusky.

*Mus.* Cuming.

Found usually on sand-flats, but occasionally met with on seaweed. They are most abundant on the leeward island of our group, from whence they become less common towards the windward, being very rarely met with on the windward island.

#### 5. HAMINEA PUSILLA.

Shell small, cylindrically ovate, rather solid, white, surface finely cancellated ; apex slightly umbilicated or perforated ; aperture narrow, contracted posteriorly ; slight fold at base of columella.

*Mus.* Cuming.

#### 6. ATYS SEMISTRIATA.

Shell oval, contracted posteriorly, thin, fragile, pellucid, white, transverse raised lines at both ends ; aperture slightly dilated at the base ; apex perforate.

*Mus.* Cuming.

#### 7. ATYS DEBILIS.

Shell cylindrically ovate, elongate, narrowed posteriorly, pellucid, fragile, white ; outer lip produced and twisted posteriorly ; apex umbilicated, and umbilicus striated or grooved, finely striated transversely, transverse raised lines at both ends ; columella with a fold at the base.

*Mus.* Cuming.

### Genus VOLVATELLA.

Shell convolute, subpyriform ; aperture wide anteriorly, contracted posteriorly and produced, forming a circular aperture.

*Animal*.—Mantle concealed ; cephalic disc quadrate ; tentacular lobes produced from the corners ; anal aperture posterior ; foot small and triangular.

#### 8. VOLVATELLA FRAGILIS.

Shell thin, horny, subpyriform, convolute (finely striated longitudinally), covered with a membranaceous epidermis ; spire none ; aperture wide, dilated at the base and contracted posteriorly ; the lips thin and entire, meeting at about one-half the length of the shell



and folding closely one over the other, posteriorly produced in the form of a tube, leaving a circular aperture; colour yellowish.

*Animal*.—Mantle not exposed; cephalic disk quadrate, slightly in advance of the shell; tentacular lobes four, produced from the corners of cephalic disk, round, short and bluntly rounded at their extremities, anterior pair slightly longer; foot small, not extending posteriorly beyond the aperture, and not reaching in front the anterior side of the cephalic disc, of an oblong triangular shape, widest in front; eyes minute at inner base of posterior tentacles; anal opening at posterior aperture; colour white.

*Mus.* Cuming.

This anomalous animal was found on sea-weed dredged from a salt-water pond. It remained alive several days in a glass jar; it was very timid and slow in its movements. The animal would occasionally protrude slightly from the posterior aperture.

#### Genus PHILINOPSIS.

*Animal*.—Head-disk large, oblong oval or triangular, not extending in advance of the foot. Posterior to the head-disk the body is extended in the shape of a convex fleshy lobe, commencing under the head disk (which overlaps it), and reaching to or slightly beyond the posterior portion of the foot; truncated behind, and the truncation surrounded by an undulated or crenated crest. Eyes not visible. Mouth proboscidiform between cephalic disk and foot, with or without one pair of tentacles on sides of the mouth. Foot large, rounded and reflected at the sides. Branchial plume near the posterior end of the body, and curving around between the truncated end of the foot. Shell concealed in the truncated end.

#### 9. PHILINOPSIS SPECIOSA.

Oblong, smooth. Head-disk about half the length of the animal, of an oblong triangular shape, truncated in front, and corners obtusely rounded. The mantle-lobe is convex, rather narrowed anteriorly and truncated posteriorly, commencing under the head-disk and extending slightly beyond the posterior portion of the foot; the truncated end is prolonged behind laterally, and surrounded by an elevated undulated crest. No visible eyes or dorsal tentacles. Oral tentacles small, dilated, truncated, and placed at the sides of the mouth. The foot and the head-disk project in advance of the mouth, which can be protruded in the shape of a proboscis. Foot broad, oval, smooth, rounded and reflected at the sides. Branchial plume single, pinnate, arising from the right posterior end of the animal, and curving to the left between the foot and the truncated end of mantle-lobe. Excretory orifice posterior. Shell concealed in the truncated end, white, thin, fragile, pellucid, subtriangular, with a curved callous apex; surface with furrows of growth. Colour above fawn, spotted and speckled with white; margins more or less varied with blackish and yellow; sides paler. Foot purplish fawn, and

closely freckled with whitish, and broadly margined on both sides with the dorsal colours intermixed.

Length 3 inches.

Station, among sea-weed on the coral reefs. They were very sluggish in confinement. One specimen, when placed in a glass jar, voided about a dozen small *Bullæ*, shells perfect. They differ but a trifle in colour, some being darker than others. The foot always remains turned over on the sides of the body.

#### 10. PHILINOPSIS NIGRA.

Oblong, slightly rugose above. Head-disk rather more than one-third of the length of the animal, oblong oval, acutely rounded in front and rounded posteriorly. The mantle lobe rather wider than head disk, of an oblong-oval shape, and the lateral ends of the truncation prolonged posteriorly into compressed crenate lobes, which are continued over the truncated portion, forming a slight crest. No visible eyes or tentacles. Shell buried in the truncated end. Foot elliptically oval, smooth, revolute laterally. Branchial plume single, situated on the right posterior end, and curving to the left. Colour black, with two large white spots on anterior end, also two on the head disk and two on the mantle lobe; sides white, and foot white, with three large black spots on each revolute side.

Found on sea-weed in the upper laminarian zone.

#### 11. DOLABELLA VARIEGATA.

Oblong, rugose, covered with small acute tubercles and more or less acute ridges; the tuberculations are scabrous, and furnished, as well as the different portions of the body, with pale, soft cirrhi, which are most conspicuous on the head. The posterior portion is obliquely truncated, from which part the body gradually tapers to the head; the surface of the truncation is convex, with the upper margin acutely elevated. The lobes of the mantle are closely appressed, the left overlapping the right, leaving two openings on the back, one a little in advance of the truncation, and the other on its centre. Dorsal tentacles stout, deeply grooved laterally, and somewhat swollen. Head convex above. Oral tentacles short, stout, grooved laterally and much dilated outwards. Foot rugose, truncated in front, and acutely rounded behind, widest posteriorly. Colour greenish-olive, variegated with brown, white, and green; inside of the lobes light brown dotted with white; a stripe of tawny brown along sides of the foot. Foot dark orange.

Length 10 inches.

#### 12. DOLABRIFERA OLIVACEA.

Elongate pyriform shape, rounded posteriorly, rugose, and ornamented with small filaments. Back convexly rounded. Mantle lobes small, rounded and closely enveloping the body, the right overlapping the left, leaving two small orifices; a groove extends from the mantle lobes along the back and right side of head to the mouth. Dorsal tentacles grooved laterally and slightly dilating out-

wards. Oral tentacles longer than the dorsal, and curved forwards, grooved and much dilated. Eyes small, black, distinct, sessile in front laterally to dorsal tentacles. Mouth with a bilobed veil. Foot smooth; shape same as body. Colour varies; usually of a dark olive-green with sap-green margins, and varied with whitish and dusky. Filaments pale. Foot pale greenish-slate, dotted with dusky brown and white.

The eggs are deposited under stones, coiled from right to left.

### ✓ 13. SYPHONOTA BIPES.

Oblong, smooth, elevately rounded above, compressed towards the foot. Neck long. Mantle lobes ample, thin, half the length of the animal, and rounded in outline. Dorsal tentacles small, grooved, and blunt. Oral tentacles large, strongly dilated, and united in front, forming a kind of veil, beneath which is the mouth. Eyes small, black, somewhat lateral, a little in advance of dorsal tentacles. Head rather flattened in front, convex in profile, with a groove extending from the muzzle along its side and over the back of the animal. Siphonal tube very large and prominent, and expanding outwards. Branchiæ exposed when the mantle is thrown on one side. Foot narrowed anteriorly, widest posteriorly, and rounded; the foot is double; the posterior portion (of a circular shape) is smooth, and projects slightly laterally and posteriorly, being quite distinct from the anterior portion, which is slightly rugose. Shell large, thin, flexible. Colour brownish or brownish-olive, veined with dusky and clouded with white, or dusky slightly spotted with the same. Foot pale ash.

This species contracts itself when handled so as to form a ball. The young are subpellucid.

The hinder part of the foot is evidently used as a sucker by which the animal suspends itself.

### ✓ 14. SYPHONOTA GRANDIS.

Body oblong, smooth, elevately rounded above and rather compressed along the sides. Mantle lobes thin, rounded, much dilated and strongly undulated along the margins. Dorsal tentacles rather large, pointed, dilating outwards and grooved. Oral tentacles grooved, about same size as the dorsal, with a furrow extending from beneath the right one along the neck and terminating on the back, between the mantle lobes. Foot elongate narrow, corrugated, and projecting posteriorly, where it is rounded. The siphonal tube is on the posterior lateral portion of the back, canaliculated and curved, and extending above the back. Shell large, covered by a thin membrane, ovately rounded, thin, fragile, with rugose lines of growth, a deep rounded sinus on the right side near the apex. Apex small and callous. Colour purplish brown, pale along the flanks, everywhere above densely crowded with minute white dots, which on the sides are arranged in circular clusters, forming spots. Foot pale. The young are of a very pale colour.

This species was found gregarious on a rocky bottom. They generally carry the mantle lobes expanded, spreading open and exposing the shell and branchiæ. When confined in a glass jar, they used the posterior portion of the foot as a sucker, suspending themselves from the glass, although there was no division of the foot, as in the preceding species.

#### 15. SYPHONOTA ELONGATA.

Form oblong, smooth. Back elevated, so much so as to give it a slightly compressed appearance. Mantle-lobes strongly dilated and undulated, and free nearly the whole length of the back. Dorsal tentacles rather slender and ear-shaped; anterior pair large and dilated. Foot narrow and terminating in a point posteriorly, which projects beyond the back. Colour of a darker or lighter brown, which colour is most intense on the top of the head and neck. The whole dorsal region is clouded and minutely speckled with white. The shell is distinctly defined in the living animal, being covered with a thin translucent membrane.

#### 16. ACLESIA AREOLA.

Elongate, smooth, rounded above, rather compressed on the sides, and everywhere covered with small branchial filaments. Mantle-lobes elevated, short, rounded, and a groove extending from where they unite anteriorly on the back along the right side of the head to the mouth. Dorsal tentacles elongate and grooved laterally. Oral tentacles similar, but slightly dilated. Eyes a little in advance and slightly lateral to the base of the dorsal tentacles. Branchiæ large, exposed or covered by the lobes of the mantle. Siphonal tube posterior and tubular. Foot narrow, elongated, and projecting far beyond the lobes of the mantle in a point. Colour cinereous or greenish-ash, densely and minutely veined longitudinally, and minutely speckled and clouded with white. Remote ocellations with blue centres and brown rings on a fawn ground, and scattering simple brown spots.

Length 2 inches.

Found living gregarious among sea-weed.

#### 17. PLEUROBRANCHUS PELLUCIDUS.

Mantle oval, smooth, convex above, not covering the foot behind, and the margins slightly undulated. Tentacles short, stout, smooth, truncated and grooved. Oral veil large, broad, emarginated in the front, which part is much prolonged laterally, so as to give it a triangular form. Eyes sessile, immersed at the posterior inner bases of the tentacles. Foot large. Branchiæ on the right side, tripinnate, elongate and exposed. Colour whitish translucent, and the whole upper surface of the mantle, with the exception of that portion covering the shell, minutely reticulated. Shell rather large, oblongo-ovate, whitish horn-colour, thin, fragile, pellucid, and rather more obtusely rounded before than behind. Surface above convex, and

coarsely marked with concentric wrinkles; nucleus, posterior and lateral, forming a small cavity at that portion of the shell.

Length 5 lines.

#### 18. PLEUROBRANCHUS MARGINATUS.

Form oval, smooth, convex above and subpellucid. Mantle widest at the middle, rounded behind and truncately rounded in front, and concealing the foot. Tentacles rather long, stout, grooved, truncated, and cylindrical. Oral veil triangular. Foot oblong oval. Colour pale lemon-yellow, freckled with white and margined with light red. Shell ovate, thin, fragile, pellucid, whitish horn-colour, with a dull red tinge near the nucleus. Nucleus subspiral. Striæ of growth coarse.

Under stones in the lower region of the littoral zone.

#### 19. PLEUROBRANCHUS RUFUS.

Form oval, smooth, and convex above. Mantle concealing the foot, widest at the middle, rounded behind, and somewhat concave in front. Tentacles stout, truncated, grooved, and cylindrically tapering. Oral veil subtriangular. Branchiæ tripinnate, with the pinnæ arranged alternately. Foot oblong oval, rounded at both ends. Colour uniform vermilion.

Length 1 inch.

Under stones in the lower region of littoral zone.

#### 20. PLEUROBRANCHUS VARIANS.

Oval, rather rugose, convex above. Mantle rounded behind, deeply sinuose in front, and margins slightly undulated. Tentacles arising from the head, curving laterally, deeply grooved below, truncated, cylindrically tapering, transversely lamellated. Eyes at their posterior bases. Oral veil large, convex in front, and much dilating laterally, where it is deeply grooved. Mouth probosciform. Branchial plume simple, pinnate on the middle of the right side. Foot large, reaching the edge of the mantle laterally and behind. Colour varying; some bright red, others lemon-yellow, or purplish brown, others again variegated with whitish; beneath paler than above. Shell on the anterior half of the body, concealed, small, fragile, pellucid, oblong-ovate, convex, and ornamented with wrinkles of growth. Nucleus posterior, more or less brownish.

#### 21. PLEUROBRANCHUS RETICULATUS.

Oval, convex above, and covered with crowded depressed granules, with multiangular bases. Mantle rounded behind and deeply sinuated in front, and repand, rather thin and undulated along the lateral margins. Tentacles arising from the lateral anterior portion of the head, approximating at their bases, stout, large, truncated, slightly swollen, transversely laminated, grooved in front. Eyes sessile, conspicuous at their posterior bases. Mouth probosciform. Veil large, granose above, triangular, and grooved laterally. Branchial plume single, simple, pinnate on the middle of the right side, free

half of its length, along the middle of the plume two rows of alternate granules. Foot large, oval, reaching the margins of the mantle laterally and projecting a little posteriorly. Colour above pale purplish, with much darker granules, which gives it a beautifully reticulated appearance; beneath paler than above; disk of the foot light purplish-grey.

#### 22. DORIS SETOSA.

Form elongate-oval, smooth, similarly rounded at both extremities, and slightly widest a little posterior to the middle. Mantle concealing the foot, convexly rounded above and rather densely pilose, with slender filamentous processes. Branchiæ rather large, ten-pinnate, erect, converging, surrounding the vent, and retractile in a common cavity. Dorsal tentacles large, stout, ovate, with their tips obtusely mucronated, coarsely and strongly obliquely lamellated, and retractile into simple cavities. Foot oblong, rounded at both ends, and not projecting beyond the edges of the mantle. Labial appendages elongate and cylindrically tapering to a point. Colour yellowish-grey, with numerous indistinct black points and abbreviated lines on the dorsal region. Tentacles dull yellow. Branchiæ same colour as the tentacles. Beneath, the mantle minutely speckled with dusky. Disk of foot translucent, so much so that the viscera are visible, slightly tinged with yellow anteriorly.

Length  $\frac{1}{16}$  of an inch.

Its pilose appearance and mucronated tentacles readily distinguish it from any other species found in these seas.

#### 23. DORIS EXCAVATA.

Body oval, rigid, scabrous, convexly rounded above, widest in the middle, and obtusely rounded at both ends. Mantle concealing the foot, margins thin. Dorsal region with prominent, crowded, irregular acute ridges and granules, several subcircular, large, elevated acute ridges, which form deep concave pits. Branchial plumes small, seven, arising from a prominent circular rim. Dorsal tentacles remote, mucronated at the tips with blunt papillæ, and retractile into slightly prominent sheaths, which have crenate edges. Oral tentacles small, conical. Mouth prominent. Foot oblong-oval, slightly truncated in front. Colour light orange-red, with large patches of a light yellowish fawn. Branchiæ light brown, and powdered with white. Dorsal tentacles fawn, and densely freckled with white; beneath uniform light orange-red. The posterior portion of the body is provided with a cylindrical muscular attachment, uniting the mantle with the foot.

Length 2 inches.

#### 24. DORIS RETICULATA.

Body rigid, oval, convexly rounded above. Mantle entirely concealing the foot, granulose laterally, the dorsal region remotely and reticulately ridged; margins thick, and very slightly undulated.

Branchial plumes small, six, tripinnate, arborescent, retractile, and surrounding the excretory orifice. [Dorsal tentacles were concealed.] Mouth proboscidiform, vertical, and placed between the foot and the mantle. Oral tentacles very small. Foot elliptically oval, truncated in front. Colour above dark red, with a few large clusters of white freckles. Foot rich orange-red.

Length  $2\frac{1}{4}$  inches; breadth  $1\frac{1}{2}$  inch.

#### 25. DORIS ECHINATA.

Form oblongo-ovate, rigid, scabrous, rounded above. Mantle small, rounded in front, acuminate rounded behind, not covering foot at the posterior half. The whole dorsal region covered with spinose globular granules. The branchial plumes inserted at the posterior tip of the mantle, five, arborescent, tripinnate, procumbent posteriorly, encircling the vent and retractile into a common cavity. Dorsal tentacles large, ovate, obtusely mucronate, obliquely and coarsely laminated, stoutly pedunculate, and retractile into tubular cavities. Labial tentacles small and cylindrically tapering. Foot large, oblong, bluntly rounded in front, which is the widest portion, gradually tapering behind to a tip, which is rudely crenulated. Colour light greyish-brown, much paler beneath; a few brown dots along posterior edge of the mantle.

This remarkable species was taken on a bed of sea-weed, and, like all the rigid species, is of a sluggish nature. During locomotion the posterior end and sides of the foot are exposed. Dorsal tentacles nearly erect, and the branchiæ protruding posteriorly.

#### 26. DORIS SCABRIUSCULA.

Form oblongo-ovate, rigid, scabrous and convexly rounded above. Mantle, which entirely conceals the foot, rounded at both ends, widest in the middle, and the upper surface covered with mammillated conical tubercles, which decrease in size towards the margins, and are united by elevated net-like reticulations. Branchial plumes placed far back, of moderate size, suberect, six in number, arborescent, tripinnate and retractile into a common simple cavity. Dorsal tentacles oblongo-ovate, acute, rudely lamellated obliquely, and retractile into simple cavities. Labial tentacles small and lobed. Foot oval, elongate, and rounded at both ends. Colour above greyish-olive, with three longitudinal series of dusky spots; dorsal tubercles and reticulations whitish. Dorsal tentacles pale, with dusky lamella. Branchiæ dusky ash. Disk of foot whitish, with a pale yellowish tinge.

Length 1 inch 4 lines.

#### 27. DORIS PILOSA.

Form oblongo-ovate, rigid, convexly rounded above and pilose. Mantle rounded at both ends, concealing the foot; margins ciliated, with small tentacular processes, and the whole upper surface covered with similar appendages, which gives it a pilose appearance. Branchial

plumes small, erect, ten, rudely pinnate, surrounding the vent, and retractile into a common ciliated cavity. Dorsal tentacles rather large, ovate, obtusely mucronated, rudely and coarsely laminated obliquely, and retractile into ciliated cavities. Labial appendages slender and tapering cylindrically. Foot oblong and rounded at both ends. Colour ashy-grey, dotted with dusky. Tips of the branchiæ brown, and also the lamellæ of dorsal tentacles.

#### 28. *DORIS VIBRATA.*

The general outline of this species is oblong; when at rest it assumes an oval form. Mantle smooth, convexly rounded above, rounded and somewhat dilated in front, acutely rounded behind, margins thin, not concealing the foot behind. Branchial plumes small, suberect, seven in number, linear, quadrangular, and ciliated on the angles their whole length, retractile into a common simple cavity. They decrease in size posteriorly. Anal tube prominent. Dorsal tentacles short, ovate, obliquely lamellated, and retractile into simple cavities. Labial tentacles small and cylindrically tapering. Foot elongate, nearly as wide as the mantle, obtusely rounded in front and tapering to an acutely round point behind, which projects beyond the posterior end of the mantle. Colour above yellow, irregularly spotted with white, pale towards the margins, which are dotted and edged with purple. Branchial plumes edged with violet. Dorsal tentacles violet, with uncoloured peduncles. Foot white.

When in confinement very active, and, whether creeping or at rest, continually vibrating its branchiæ.

The above and two following species form a group, similar in general form, with simple, linear, quadrangular-shaped branchiæ.

#### 29. *DORIS PROPINQUATA.*

Form, when at rest, oblong, substance very soft. Mantle convex above and covered with rather distant, depressed, irregular-sized white papillæ, which do not extend to the margins. Extremities rounded, rather wider posteriorly, not concealing the foot behind; margins thin, and much undulated. Branchial plumes large, suberect, twelve in number, linear, nearly quadrangular in their transverse section, ciliated, decreasing in height posteriorly, surrounding the vent, and retractile into a common simple cavity. Anal tube erect and very prominent. Dorsal tentacles rather large, nearly erect, elongately ovate, obliquely finely lamellate and retractile into simple cavities. Head prominent and furnished with elongate, cylindrically tapering tentacular appendages. Foot elongate, tapering posteriorly to a point far behind the mantle. Colour above bright yellow, becoming white at the margins, which are bordered irregularly with purple; four oblong dots of the same colour in front of the dorsal tentacles. Dorsal tentacles purple on the outer portion. Branchial plumes edged with the same colour.

Length 1 inch 3 lines.

This *Doris* possesses the same habit of vibrating its branchial plumes as the preceding.



30. *DORIS PICTA*.

Form, when at rest, oval ; soft, similarly rounded at both extremities, and convexly rounded above. Mantle not concealing the foot, rather widest in the middle, and the margins thin and very slightly undulated. Branchiæ small, suberect, curving centrally, ten in number, decreasing in size posteriorly, encircling the vent, and retractile into a common cavity ; each branchia is subquadrangular, tapering to a point and ciliated. Dorsal tentacles rather small, ovate, with short peduncles, obliquely lamellated and retractile into simple cavities. Foot elongate, extending beyond the mantle, terminating in an acutely rounded point, the margins slightly undulated. Labial appendages small, cylindrically tapering to a blunt point. Colour white, with small irregular white spots. Obsolete yellow spots along the margin, which, as well as the foot, is bordered with orange. The angular edges of the branchiæ edged with carmine. Tentacles tipped with orange.

Length 1 inch 6 lines.

31. *DORIS NUCLEOLA*.

Form oval, rigid, rounded at both extremities and convexly rounded above. Mantle covers the foot, margins thin, upper surface rough, with remote papillæ and small lacinated processes, which are most conspicuous posteriorly. Branchial plumes small, erect, five in number, pinnate, surrounding the vent, and retractile into a common cavity. Dorsal tentacles ovate, acute, closely and finely lamellated obliquely. Foot oval, rounded at both ends. Colour orange, dusky along the dorsal region, and shaded with purple on each side of the branchiæ.

32. *DORIS DECORA*.

Oblong, smooth, soft, and convexly rounded above. Mantle rounded in front, acutely rounded behind. Margins thin and simple, not covering the foot behind. Branchial plumes small, nearly erect, seven in number, pinnate, decreasing in height posteriorly, surrounding the vent and retractile into a common simple cavity. Dorsal tentacles elongate-ovate, obliquely lamellated, peduncles as long as the lamellated portion, retractile into simple cavities. Labial tentacles small and conical. Foot narrow, rounded in front, tapering behind to an acuminate rounded tip, projecting far beyond the end of the mantle. Colour: Dorsal region pale straw-colour, with a medial whitish longitudinal stripe, which is bifurcated posteriorly and dotted with purple. The margin of the mantle is bordered with white and dotted with purple ; an intramarginal light red band, contiguous to which is a yellow one, which is dotted with purple. Branchiæ and tentacles pale. Beneath the mantle is coloured as above, but much paler.

Length 1 inch 2 lines.

This truly magnificent species was obtained on sea-weed. The specimens were very active, and when creeping resemble a *Goniodoris* in outline.

33. *DORIS MARGINATA*.

Elongate, smooth and convexly rounded above. Mantle somewhat dilated and rounded in front, acuminate rounded behind. Margins thin. Branchial plumes seven, small, erect, pinnate, and retractile into a common simple cavity. Dorsal tentacles elongate-ovate, peduncles long, obliquely lamellated, and retractile into simple cavities. Labial tentacles small and conical. Foot narrow, elongate, bluntly rounded and widest in front, tapering to a point behind and projecting far beyond the posterior end of the mantle. Colour white; mantle edged with light red and an intramarginal tinge of yellow.

The above species is quite active, and while creeping, the tentacles are inclined forward and laterally. When placed in a basin of water, they suspended themselves from the surface, back downwards.

34. *DORIS PAPILLOSA*.

Oval, rigid, rounded alike at both ends, convexly rounded above. Mantle entirely concealing the foot, widest in the middle, upper surface covered with small papillæ, not very crowded, and of various sizes. Foot oval, rounded at both ends. Colour greyish. Dorsal region livid. Beneath the mantle orange. Foot pale grey.

Length 8 lines.

Tentacles and branchiæ undetermined.

35. *DORIS ALBOPUSTULOSA*.

When at rest, of an oblongo-ovate form, soft. Mantle rounded at both extremities, edges thin and undulated, and concealing the foot; the upper surface is covered with white depressed, irregular-shaped and unequal-sized pustules, which do not quite reach the margins. Branchial plumes six, rather small, erect, incurved, pinnate, surrounding the vent and retractile into a common rimate cavity. Dorsal tentacles somewhat large, oblong-ovate, coarsely and obliquely lamellate, and retractile into rimate cavities. Head is prominent, convex in front, and furnished with cylindrically tapering labial appendages. Foot, when in motion, elongate, narrow, and rounded at both ends. Colour above lemon-yellow, pustules white, and the margins of the mantle edged with purple. Dorsal tentacles reddish-brown, with white lamellæ. Branchiæ white. Foot and beneath the mantle white.

Length 1 inch.

36. *DORIS GRANDIFLORA*.

Oblongo-ovate, similarly rounded at both extremities, convex above, and of a soft texture. Mantle widest in the middle, not concealing the foot, thin and crisped along its margins. Upper surface strongly rugose, and covered with irregular-sized, prominent, rounded tubercles. Branchiæ very large, procumbent, arborescent, five in number, inserted far back, encircling the vent and retractile

into a common cavity. Dorsal tentacles moderate in size, rather slender, oblong-ovate, obliquely lamellated, stoutly pedunculate, and retractile into tubular cavities. Foot large, nearly similarly rounded at both ends, projecting posteriorly beyond the mantle, and the margins thin and crisped. Labial lobes flattened and dilated. Colour above darkish fawn, rather closely veined with palish. Tubercles lighter than ground-colour and tipped with dusky. Margins of mantle with dark blotches. Dorsal tentacles fawn, with translucent peduncles. Branchiæ greyish-fawn, remotely spotted with whitish, and the external surface of the branches pale, and the inner surface dusky.

Length  $3\frac{3}{4}$  inches.

The spawn, which is deposited under the surface of loose stones in an irregular spiral coil of a few whorls, is of a faded yellow colour.

### 37. DORIS RUGOSA.

Form ovate, rigid, rounded at both extremities and rather the widest posteriorly; above covered with crowded granular unequal tubercles, of which some are very large and elevated; the surface on the dorsal region between the tubercles is somewhat rugose. Mantle convexly rounded above, entirely concealing the foot, thin and rugose along the margins, which are somewhat undulated. Branchial plumes five, tripinnate, very large and recumbent, retractile, surrounding the vent; at the base and between the branchial plumes are five conical elevated tubercles. Anal tube long, cylindrical, tapering and projecting backwards. Dorsal tentacles pinnatifid, lamellated, and retractile into tubular cavities. Oral tentacles, none apparent. Mouth simple, between the foot and edge of the mantle. Foot narrow, elongate, elliptical, rounded at both ends and margin slightly undulated. Colour above darker or lighter purplish brown, some fawn colour. Branchial plumes deep brown, fringes paler. Beneath the mantle purplish brown, paler towards the margins. Foot pale.

Length 5 inches; breadth  $3\frac{1}{2}$ .

### 38. DORIS FÆTIDA.

Form oval, rigid, convex above, rugose and with a few ridges, one of which is in a longitudinal medial line, others transverse, and others small and irregular near the margins of the mantle. Margins of the mantle thin. Branchial plumes six, tripinnate, and retractile into a six-lobed cavity, which has elevated margins. Dorsal tentacles distant, acutely conic, lamellated, and retractile in a tubular cavity. Foot narrow, elongate, oval, wholly concealed by the mantle. Oral tentacles small and dilated. Proboscis lobed; above purplish brown, fawn or yellowish brown, with pale ridges, and generally with the edge of the mantle tinged with pinkish. Branchiæ pale fawn; tentacles pale orange; beneath pale yellowish.

This species occurs at low water on rocky coasts. It emits a strong and disagreeable odour.

39. *DORIS PRISMATICA*, var. *IMPERIALIS*.

Form elongate, smooth, and convex above. Mantle small, narrow, dilated and rounded in front, and more acutely rounded behind. Foot much elongated, pointed posteriorly, and projecting far behind the mantle. Branchial plumes rather large, erect, non-retractile, ten in number, the six anterior ones simple, the succeeding two trifurcate, and the posterior pair quadrifurcate; they all decrease in height posteriorly, and in structure are linear, quadrangular and ciliated. Anal tube prominent. Dorsal tentacles oblong-ovate, slightly compressed, closely and finely lamellated obliquely and sub-retractile. Oral tentacles cylindrically tapering. Colour pale cream white, and spotted above and on the sides with rich yellow; the spots are small, irregular, and very slightly raised. The mantle is margined with purple, and there are a few broken rings of the same colour on the sides and upper posterior end of the foot, each ring having a yellow centre. The branchiæ are pale and edged with purple. The dorsal tentacles are deep black, minutely speckled with white, and marked with two longitudinal white lines, one behind and the other in front.

Length 2 inches.

40. *DORIS PRISMATICA*, var. *LINEATA*.

Elongate, soft, smooth, convexly rounded above, rather wider posteriorly, portion anterior to the dorsal tentacles somewhat dilated laterally and rounded in front. Branchiæ small, erect, lanceolate, pinnate, ten in number, encircling the vent and retractile into a common cavity. Dorsal tentacles elongate, straight, directed forward and laterally, lamellated about two-thirds of their length, and retractile into simple cavities. Foot elongated and projecting much beyond the posterior edge of the body in a point, rounded in front. Colour light greyish-purple, along the back and the remainder of body white, irregular, longitudinal, opaque fine white lines on the dorsal region, some of which are confluent. Margins of foot and body beautifully edged with violet. Branchiæ whitish and longitudinally striped with orange. Tentacles white, with an orange zone near the tips, and a second near their base.

Length 1 inch.

Genus *DORIOPSIS*.

Oblong, or oval depressed; mantle large, covering the head and foot. Dorsal tentacles two, lamellated and retractile, non-pedunculate; orals none. Branchial plumes disposed in the form of a semicircle, on the posterior portion of the back, and retractile into a similarly formed slit, the convex portion posteriorly.

41. *DORIOPSIS GRANULOSA*.

Form oblongo-ovate, papillose, rather rigid, convex above; mantle similarly rounded at both ends, entirely concealing the foot, rather contracted in the middle, and covered with minute irregularly promi-

ment granules. Dorsal tentacles small, erect, not pedunculated, ovate, coarsely and obliquely lamellated, and retractile into simple cavities. Branchial plumes eleven, large, rudely pinnate, increasing in height posteriorly, procumbent, and retractile into a simple semicircular cavity. Muzzle prominent. Foot oblong, rounded at both ends. Colour pale yellow, with green papillæ.

At first sight the above species might be confounded with the small rigid granular species of *Doris*; but the arrangement of the branchiæ and the non-pedunculated dorsal tentacles constitute differences sufficient to separate it.

#### 42. HEXABRANCHUS PULCHELLUS.

Form oblongo-ovate, smooth, and subpellucid. Mantle depressed, convex above, similarly rounded at both ends; margins thin and undulated. Branchial plumes seven, small, ramose, erect, surrounding the vent, and each retractile into a simple cavity. Dorsal tentacles remote from each other, ovate, finely and obliquely lamellated, and retractile into simple cavities. Oral tentacles large, compressed, and strongly dilated outwards. Foot elongate-oval, and projecting posteriorly beyond the mantle. Colour pale, with a light yellow tinge along the dorsal region, where there are also numerous carmine dots; similar coloured dots around the margin of the mantle, which is edged with white. Branchiæ pale and edged with carmine. Tentacles pale and tipped with carmine.

#### 43. HEXABRANCHUS NEBULOSUS.

Body oblongo-ovate, smooth, during locomotion much elongated. Mantle rounded above, widest in the middle, rounded at both ends; edges thin, crenate and undulated. Branchial plumes eight, inserted far back, large, curved and elevated, tripinnate, and retractile in cavities around the vent. Dorsal tentacles large, ovate, stoutly pedunculate, pinnatifid, lamellate, and retractile into simple cavities. Orals small, scarcely visible. Foot elongate, projecting beyond the mantle posteriorly during locomotion, emarginated in front; lateral edges thin. Mouth close to the foot. Colour, above black, margined with bluish slate, with numerous irregular-sized round whitish dots, which are the most numerous around the margins. Branchial plumes pale dusky. Dorsal tentacles darker, tips white.

Length  $1\frac{3}{4}$  inch.

#### 44. TRITONIA HAWAIIENSIS.

Form elongate-oblong, widest anterior to the middle, smooth, depressed above, and tapering to a point behind. Branchial plumes arborescent, irregular in size, opposite and disposed in two rows, of eleven each, and extending to the posterior end of the body. Tentacles cylindrically tapering, and retractile into stout, tubular lacinated sheaths. Veil strongly digitated. Foot linear, grooved, and pointed at both ends. Colour pale, freckled with pale purplish-brown; a longitudinal light band extends from the head to the

posterior tip of the body, and lateral bands pass from the medial one to each of the branchial tufts. Branchiæ light purplish-brown, and tipped with light green. Tentacular sheath same colour as branchiæ. Tentacles light green.

Under stones in the upper region of the laminarian zone.

#### 45. MELIBE PILOSA.

Elongate, smooth, widest anteriorly, and tapering to a point behind. Sides convexly rounded, and the back arched. Foot linear, grooved, extending the whole length of the body, and acute at both ends. Six pairs of thick tuberculated lobes along the back, the anterior pair opposite, the others alternate to one another, the last at the tip of the body. These lobes are easily deciduous, contracted at their bases, truncated above, convex outside, and flattened on the inner surface. Frontal veil very large, semiglobular, much inflated above; united beneath the head, forming a continuous margin, which is closely fringed. Mouth probosciform, and the orifice vertical. Tentacles on the posterior portion of the veil rather remote, small, ovate, closely and transversely lamellated and retractile into long trumpet-shaped sheaths, which are furnished with lacinated appendages. Everywhere with small, soft, branched, tentacular processes. Colour fawn, subtranslucent, more or less clouded with whitish, which, under the lens, has the appearance of minute dots. Body punctured with brown, which are most conspicuous along the flanks. Tubercles on the lobes brown. Foot pale.

Length  $2\frac{1}{2}$  inches.

These animals were found among sea-weed, in the upper region of the laminarian zone, and when placed in a basin of water were very active, swimming by suddenly curving the head and tail laterally, so as nearly to touch one another. When slightly disturbed they would cast off one or all of their lobes. The length of their lobes varies much, being in some as large again as in others; they may be consequently reproduced, after being cast off. Their foot cannot be used for creeping on a flat surface, but is well adapted for clasping sea-weed.

#### 46. ÆOLIS SEMIDECORA.

Body smooth, hyaline, elongate, narrow, widest in front, from whence it tapers to a point behind; convex above. Six pair of branchial filaments, arranged along the sides, hyaline, elongated, compressed, tapering to a point, imbricated, and the anterior pair remote from the others; the last pair does not reach the tip of the body by one-third of its total length. Dorsal tentacles rather stout, cylindrically tapering to a blunt point, transversely rugose, approximating at their bases, with small black eyes, immersed at their posterior bases. Head convex above, and furnished with elongate, subulate, cylindrical, smooth tentacles, which are much longer than the upper pair. Foot slightly crenated along the posterior margin, notched in front, and furnished on both sides with recurved tentacular processes. Colour: freckled with opaque white along the

back, and on the head and upper tentacles. Upper tentacles absolutely annulated with pale fawn, and a vermilion dot at their anterior base. Head and front tentacles slightly varied with red. Branchial tufts freckled with opaque white, lined with blackish dotted with fawn, and with an azure reflexion.

Length 1 inch.

When placed in a basin of water this *Æolis* suspends itself, back downwards.

#### 47. *ÆOLIS PARVULA*.

Body smooth, subpellucid, tapering to a point posteriorly. Six pair of branchial tufts arranged longitudinally, the last on the posterior point of the body. Foot furnished anteriorly with lateral auricular appendages. Tentacles elongate-oval. Labial appendages elongate-subulate. Head and body subpellucid, uncoloured, freckled with vermilion. Branchial tufts olive, freckled with dusky.

Length 5 lines.

#### 48. *ELYSIA OCELLATA*.

Oblong, smooth, wider anteriorly. Body with a wide expansion on both sides, which, when open and expanded (in their natural position), are truncated posteriorly and rounded anteriorly; the surface longitudinally and obliquely plaited; when disturbed they roll together, so that their edges are parallel and medial, forming a cavernous chamber. Beneath and near the anterior end of the cloak is a papillary orifice. Head rather large, broad, concave between the tentacles, convex in profile, and furnished beneath with a large veil, dilated laterally and emarginated in front. Tentacles two, inserted at the anterior angles of the head, non-retractile, stout, cylindrically tapering to a blunt point, and grooved laterally in front. Eyes sessile, on a prominence on top of the head between the tentacles. Colour above, when the expansion is closed, cream-colour, and everywhere crowded with irregular-sized ocellations, some of which are bright fawn with white rings, others green with fawn rings, and the largest and most conspicuous bluish-green centres with black rings, outside of which are white ones. The surface of the expansion is palish, the plaits deep green, and the posterior margin violet. Tentacles deep yellowish-fawn, tipped with white, beneath which they are annulated with violet, and have the grooved edges of the same colour. Foot pale ash and crowded with ocellations, pale fawn centres and white rings.

Length  $1\frac{1}{2}$  inch.

This is a very active and hardy animal.

#### GENUS *PTEROGASTERON*.

Depressed, thin, with lateral wing-like expansions, which in their natural position are turned vertically upwards; margins strongly undulated. Neck rather long. Head rounded above, truncated in front. Mouth underneath. Upper lip bilobed. Tentacles two, ear-

shaped, arising from the angles of the head, grooved laterally and diverging anteriorly. Foot narrow. No distinct respiratory organs.

49. *PTEROGASTERON ORNATUM*.

Body smooth, and when expanded of an orbicular form; when erect, in their natural state, very high and much undulated. Tentacles grooved their whole length and slightly truncated. Colour olive-green, paler along the foot, spotted with faded yellow, and dotted with black. Body margined with bright orange-red and edged with black, in which are a few white dots. Upper surface of the body paler than below, punctured with black and light red, and margined the same as beneath.

*Hab.* On the rocky coast, among sea-weed.

50. *PTEROGASTERON BELLUM*.

Body smooth, when expanded of an oblong-ovate form, and when in their natural position are quite low when compared with preceding species. The posterior portion is acutely rounded. Tentacles stout and truncated. Colour brownish-red, and closely spotted with small, irregular, greyish-white spots. Eyes with white areolæ.

Length 1 inch.

Genus *HISTIOPHORUS*.

*Animal*.—Oblong, no distinct mantle. Body rounded; posterior portion prolonged into a vertically compressed tail, furnished above with a membranaceous crest. Branchiæ three, inserted at the middle portion of the dorsal region. Dorsal tentacles, no labial appendages. Head furnished with a veil. Foot linear.

51. *HISTIOPHORUS MACULATUS*.

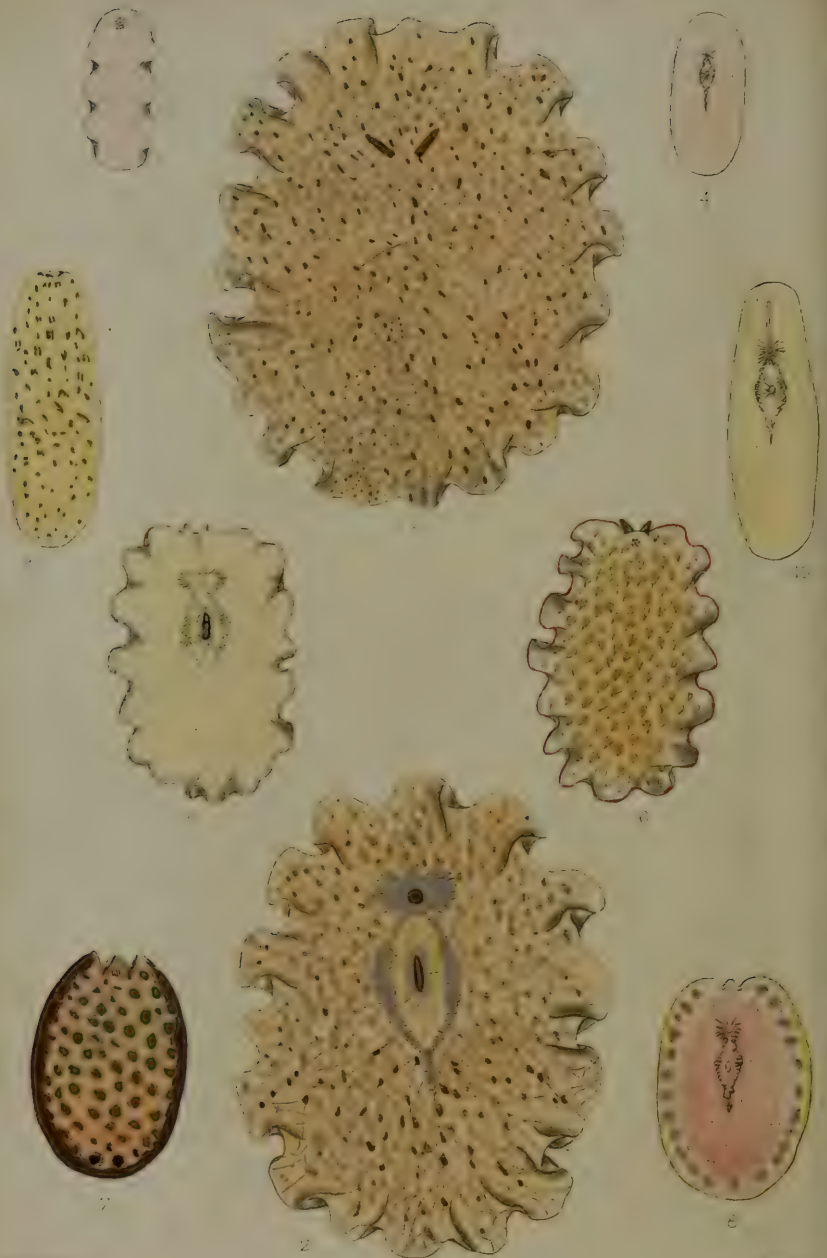
Form oblongo-ovate, smooth, subpellucid. Three tufts of filaments on each side, disposed longitudinally, and also two on dorsal region; to each of the hinder tufts is attached an oval glandular body. Branchiæ rather large, procumbent, retractile (?), fimbriated, one directed anterior, which is simple, the remaining two lateral and bifurcated. Anal tube prominent. Dorsal tentacles oblongo-ovate, mucronate, slightly compressed, retractile? and finely lamellated transversely. Head furnished with a transversely oval veil, which is broader than the body, and fimbriated around the margins with small tufts of filaments. Foot linear, extending the whole length of the body. Mouth simple. Colour pale whitish-ash, irregularly dotted with orange above, and four small crimson dots near base of branchial plumes. Branchiæ pale and freckled with brown. Dorsal tentacles green-olive, tips pale. Veil yellow.

Length  $1\frac{1}{4}$  inch.

An active animal, using its compressed tail for swimming.







Ehz M. Wing lth

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1.2 *Peasia reticulata*. 3.4 *Pinconspicua*.  
 5.6 *P. tentaculata*. 7.8 *P. maculata*. 9.10 *P.irrorata*.

5. DESCRIPTIONS OF NEW SPECIES OF PLANARIIDÆ COLLECTED  
IN THE SANDWICH ISLANDS\*. BY W. HARPER PEASE.  
(COMMUNICATED BY DR. J. E. GRAY.)

(Annulosa; Pl. LXX.)

1. PEASIA RETICULATA (Pl. LXX. figs. 1, 2).

Body oval, smooth, pellucid, no appearance of convexity above or beneath. Margins crenulate and undulated. No eyes visible. Dorsal tentacles a little anterior to the middle, small, cylindrical, and tapering slightly to an obtuse point, non-retractile. Beneath there is no appearance of a mouth; but in the thin transparent substance of the body, centrally, may be seen a set of whitish organs, which are delineated in the drawing. In colour this species varies from a light yellow to a yellowish fawn, closely veined with light brown; veins ramifying over the entire surface, and spotted with darker brown.

The spawn is deposited on the under side of stones, and is multi-spiral and closely coiled. The animals are very active, swimming by lateral undulations, and creeping in the same manner.

2. PEASIA INCONSPICUA (Pl. LXX. figs. 3, 4).

Body thin, flat above and beneath, smooth, elliptically oval, with both ends equally rounded. No foot or tentacles. On the anterior end is a cluster of minute black dots, which may possibly serve as eyes, as they occur in every specimen of this and others observed. Colour pale, translucent.

Length 7 lines.

Under stones at low-water mark.

3. PEASIA TENTACULATA (Pl. LXX. figs. 5, 6).

Form oval, strongly depressed, smooth, thin as common writing-paper, subtranslucid. Margins strongly undulated. No visible eyes. The anterior end is slightly emarginate, and has two blackish contiguous tentacular processes, which are non-retractile. The whole upper surface is covered with rather closely set tentacular processes, which are retractile, cylindrically tapering or clavate, and mucronated; the mucronated tips retractile in the large part. No foot or appearance of external branchiæ. Colour above light fawn, with pinkish margins and darker processes. Beneath paler than above.

This singular animal occurs rarely under stones at low-water mark. It swims by the undulations of its mantle, and when creeping the same undulations take place. On close examination of the

\* This series of animals appears to differ from any of the genera which have come under my observation, and to form a group by themselves, to which the name PEASIA may be applied: the descriptions and figures afford the best generic characters. I have added a specific name to each species for the purpose of distinguishing them.—J. E. Gray.

tentacles, I found them ear-shaped, pointed, grooved laterally, and the papillæ on the surface sub-retractile. When placed in a jar of water a tubular whitish organ would protrude from the central aperture and act as a sucker. Mouth probably anterior at the base of the tentacles. It is very active, and swims rapidly.

4. *PEASIA MACULATA* (Pl. LXX. figs. 7, 8).

Body oval, smooth, thin, flat above and beneath. Without foot or tentacles. Margins rather thick. At the anterior end there are two strong folds of the body. Colour above yellowish-fawn or greenish-slate, orange towards the margins, and covered with circular greenish-slate spots, encircled with white rings.

This animal is very active, swimming by the undulations of the body. When in motion it has an oblong-oval form, and when at rest a rounded outline. The folds in the anterior portion of the body are analogous to the grooved oral tentacles of *Aplysia*.

5. *PEASIA IRRORATA* (Pl. LXX. figs. 9, 10).

Body smooth, elliptical, thin, flattened, and rounded similarly at both ends. No foot or tentacles. The cluster of dots is microscopic in size and oblong in shape. Two orifices beneath, a little anterior to the middle; the anterior one has lateral radiations, or white appendages, under the surface; there extends anteriorly from this orifice an elongate tube beneath the skin, which does not quite reach the anterior margin; this vessel the animal can retract and extend. Colour above pale yellowish-fawn, irregularly dotted with brown and white, and densely minutely punctured with fawn.

Length  $\frac{3}{4}$  inch.

This species is very active, creeping by very slight but rapid undulations of the body, and also floating, back downwards, on the surface, and moving about in that position.

6. FURTHER EVIDENCE OF THE DISTINCTNESS OF THE GAMBIAN AND RÜPPELL'S SPUR-WINGED GESE (*PLECTROPTERUS GAMBENSIS* AND *P. RÜPPELLII*). BY PHILIP LUTLEY SCLATER, M.A., SECRETARY TO THE SOCIETY.

The recent death of the males of the two species of Spur-winged Geese (*Plectropterus gambensis* and *P. rüppellii*), of which I pointed out the external differences at one of last year's meetings\* of the Society, has given me the desired opportunity of comparing the tracheæ and skeletons of the two birds, and showing that these afford ample corroboration of their specific distinctness. Before proceeding to do this, I should remark that the individuals to be compared are both, as we know from their dissection, adult males. The specimen of *P. gambensis* is in all probability the older of the two, having been

\* See P.Z.S. 1859, p. 131.

living many years in the Society's Gardens. That of *P. rüppellii* was received from Eastern Africa in June 1858.

Comparing, first of all, the skulls of these two birds together, we see that the frontal protuberance, which in *P. gambensis* (fig. 1) is hardly elevated 0·2 inch above the general level, rises to an enormous size in *P. rüppellii* (fig. 2), attaining a height of 1·05, a breadth of 0·75, and a length from back to front of 1·65. It may also be remarked, that, from the hard character of the osseous structure in the protuberance of *P. gambensis*, it is obvious that it has reached its maximum of development. The outlines of the two skulls are represented in the accompanying woodcuts.

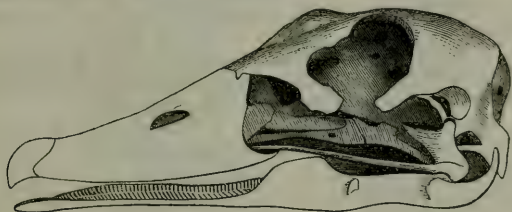


Fig. 1.

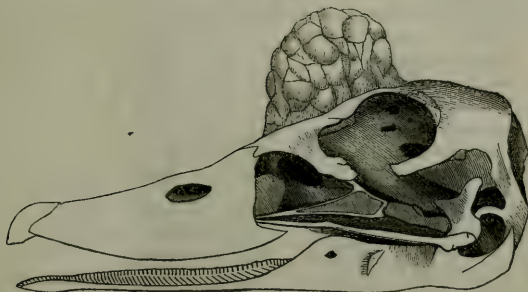


Fig. 2.

Their conformation is otherwise generally similar, that of *P. rüppellii* being slightly narrower, and rather longer. It may be remarked, however, that the skull of *P. rüppellii* is broader between the orbits; but that, drawing a vertical line from the middle of the space between the nostrils to a base-line joining the edges of the upper mandibles, and comparing them at this point, it is here narrower and more elevated; the proportion of the vertical to the base being in *P. rüppellii* about 3 : 5, in *P. gambensis* about 7 : 9. The depressed space between the protuberance and the naked part of the bill is also somewhat differently shaped in the two birds. In *P. rüppellii* the outline of this space next to the protuberance forms a segment of a circle of which the centre is at the junction-point of the two other

sides, so that the space enclosed is nearly a quadrant. In *P. gambensis* the corresponding outline is carried back much further towards the protuberance, and formed of two lines, which terminate in a central angle, so that the space enclosed is nearly a rhombus.

Dr. Günther has called my attention to the fact, that the orifices which commonly occur in the skulls of *Grallæ* and *Anatidæ*, situate in the occipital bone on both sides of the foramen magnum, are remarkably small in both these birds, particularly so in *P. rüppellii*.

The sterna of the two birds, as far as the comparison can be made (that of *P. gambensis* being rather distorted by disease), do not present any material points for comparison. The foramina, which in both species are closed at the base, are rather longer and larger in *P. gambensis*.

The subjoined measurements in inches of the bones of the wings show that these organs are comparatively longer in *P. rüppellii*, and the bones are likewise thicker and stronger:—

	<i>P. gambensis.</i>	<i>P. rüppellii.</i>
Length of humerus . . . . .	7·4	7·6
— of ulna . . . . .	6·5	6·9
— of radius . . . . .	6·25	6·6
— of metacarpus . . . . .	3·8	4·0

Comparing the posterior extremities, we find the tarsi and toes again longer in *P. rüppellii*, as the following dimensions prove:—

	<i>P. gambensis.</i>	<i>P. rüppellii.</i>
Length of femur . . . . .	3·9	4·0
— of tibia . . . . .	6·8	7·1
— of tarsus . . . . .	4·5	4·6
— of middle toe from base of tarsus to the end of the nail . . . .	4·45	4·6

The pelvis is rather narrower in *P. rüppellii*, the distance between the trochanters measuring 1·9 in. ; in *P. gambensis* 2·1 in.

The vertebræ are, cervical 15, dorsal 10, sacral 13, caudal 8 ; total 40 ; the true ribs 8, the false 2, in both species.

The tracheæ of these two birds, though, as might have been expected, showing a general resemblance, present the following differences, which are greater than such as are usually found in individuals of the same species.

When dried, they are of nearly the same length, viz. about 14·5 in., but the bronchial rings are 151 in number in *P. rüppellii*, and only 138 in *P. gambensis*. The tubes are flattened throughout the greater part, becoming cylindrical at 1·5 inch from the lower extremity. Here they are much compressed, and develop a large osseous bulb on the left side. The lower portion only of this bulb, as usual, is completely ossified, the upper part being covered with fine framework, which, as will be seen from the accompanying woodcut, assumes a different pattern in the two species. In *P. rüppellii* (figs. 2 and 4) the bulb is wider, higher, and much compressed ; in *P. gambensis* (figs. 1 and 3) shorter and comparatively much thicker. This is particularly observable in the side view, as shown in figs. 3 and 4.

From Mr. Eyton's observations (Monogr. Anatidæ, p. 79) it is evident that the *trachea* of the female *Plectropterus* is, as is generally the case in this sex, destitute of the *bulba ossea*.

Fig. 1.



Fig. 2.

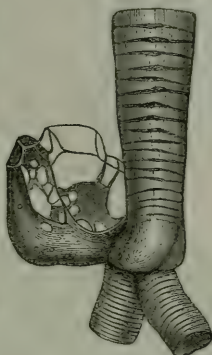


Fig. 3.



Fig. 4.

I have already pointed out the external characters by which the two Spur-winged Geese may be distinguished, and their synonymy will now stand somewhat as follows:—

#### 1. PLECTROPTERUS GAMBENSIS.

*Anas gambensis*, Linn.—*A. spinosa*, Vieill.; Lath. Gen. Syn. iii. pt. 2, p. 452, pl. 102; G. H. x. 241. — *Anser gambensis*, Benn.

Gard. Men. Zool. Soc. ii. p. 207, cum fig. — *Plectropterus gambensis*, Steph. in Shaw, Zool. xii. pt. 2, p. 7, pl. 36; Hartl. Orn. West-Afr. (partim); Eyton, Monogr. Anat. p. 79; Sclater, P.Z.S. 1859, p. 131, pl. 152. fig. 2.

*Sp. diagn.*—Minor: *protuberantia sincipitali maris parva: lateribus colli in utroque sexu plumosis.*

*Hab.* In Africa Occidentali, accidentaliter in Europa Meridionali.  
*Mus.* Brit.

## 2. PLECTROPTERUS RÜPPELLII.

*Cygnus gambensis*, Rüpp. Orn. Misc. p. 12, fig. 1.—*P. gambensis*, Denham and Clapp. Travels, App. p. 204; Hartl. Orn. West-Afr. p. 246 (partim); Sclater, P.Z.S. 1859, p. 131, pl. 152. f. 1.

*Sp. diagn.*—Major: *protuberantia sincipitali maris maxima: area rhombea ad colli latera nuda, carneo-rubra.*

*Hab.* In Africa Orientali et Centrali, in Dongola et lacu Tchad.

*Mus.* Brit.

The second species of *Plectropterus*, given by Stephens (*P. melanotus*, Shaw, Zool. xii. pt. 2, p. 8) and also met with by Denham and Clapperton (App. to Travels, p. 204), is *Sarcidiornis africana*, Eyton (Monogr. Anatidæ, p. 103).

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January 24th, 1860.

John Gould, Esq., V.P., in the Chair.

The following papers were read:—

### 1. A MONOGRAPH OF THE GENUS EPOMOPHORUS, WITH THE DESCRIPTION OF A NEW SPECIES. BY ROBERT F. TOMES.

(Mammalia, Pl. LXXV.)

In the Proceedings of the Zoological Society for 1835, Mr. Bennett gave a short description of a Frugivorous Bat from Gambia, under the name of *Pteropus epomophorus*, at the same time suggesting that the characters appeared sufficiently diverse from those of the ordinary *Pteropi* to warrant generic separation. Under these circumstances, Mr. Bennett thought the specific name, *epomophorus*, would not be inappropriate as a generic appellation. A further account was given by the same naturalist in the Transactions of the Society, where the specific name *whitei* was substituted; and the species is now usually mentioned as *Epomophorus whitei*.







During the same year, but previous to the communication by Mr. Bennett, Mr. Ogilby had described a *Pteropus* from Gambia under the name of *P. macrocephalus*. In the volume of Lardner's 'Cabinet Cyclopædia' devoted to the natural history and classification of Quadrupeds, Mr. Swainson described a *Pteropus*, and gave a figure of the head, from Western Africa, for which the name of *P. megacephalus* was proposed. The volume bears date 1835.

All these species are now found to be identical, *Epomophorus whitei* being the male, and the other two the female of the same species. As far as can be ascertained, Mr. Ogilby's name has the priority, and should therefore be made use of; but, before going further into the synonymy of the species, I will give the results of some examinations made with a view to the determination of the generic peculiarities of this and other closely affined species.

The backward position of the wings, and the length of the face, have been already mentioned by the first describers, and the excessive development of the upper lips has been noticed by M. Temminck in another species called by him *Pachysoma labiatum*; but there are some other peculiarities (having reference to this last character) not hitherto sufficiently insisted on.

The original specimens described by Mr. Bennett and Mr. Ogilby having passed into my hands, together with a number of other specimens of this and two other species referable to the same group, I have been able to examine them with exactness, and more especially to compare their crania with those of other fruit-eating Bats. The result has been a thorough conviction not only of their generic distinction, but that the genus is more removed from the ordinary *Pteropi* than is *Pachysoma*, or even perhaps *Macroglossus*.

For the better understanding of the affinities of the present genus, I deem it advisable first to institute an inquiry into the relation of the genera *Pteropus* and *Pachysoma* to each other, and afterwards to compare with them the various species of *Epomophori*.

M. Geoffroy St.-Hilaire, in his 'Leçons sur les Mammifères,' has separated from the genus *Pteropus* several species which depart from the more typical forms of that genus in being possessed of a tail, in having the muzzle shorter and thicker, and the lower jaw provided with only five molar teeth, that of *Pteropus* proper having six.

In the 'Annales des Sciences Naturelles' for 1828\*, M. Isid. Geoffroy, after adverting to the establishment of this genus by his father, observes, "Le museau des *Pachysomes* est gros, et leur boîte cérébrale est très-volumineuse et sphéroïdale; mais entre ces deux parties existe un rétrécissement très-sensible, quoique beaucoup moins prononcé que chez les grandes Roussettes. Un grand espace existe ainsi entre les parois du crâne et les arcades zygomatiques, qui sont d'ailleurs beaucoup plus écartées que chez les Roussettes; et comme l'étendue de cet espace est en rapport avec le volume du masséter et du crotaphyte, nous voyons s'accroître de beaucoup chez les *Pachysomes* la force des muscles élévateurs de la mâchoire

\* This communication bears date Oct. 1828, whilst the published volume of the 'Leçons' is dated 1829.

inférieure ; fait d'autant plus remarquable que cette mâchoire elle-même est courte, et n'a d'étendue que dans la portion qui donne insertion aux muscles, c'est-à-dire sa portion postérieure et son apophyse coronôide."

The peculiarities here pointed out in the cranium of those species which have a tail should not be regarded as characters necessarily associated with that appendage, but as incidental to the smaller species of the group ; the tail also in this particular group being restricted to the smaller species. "The smaller species in any natural family of Mammalia," says Professor Owen, "resemble the fœtus of the larger species in the general proportional size of the brain and eyes." This well-known law will, if followed out, explain pretty fully the nature of the differences in the crania of the larger and smaller *Pteropi*. The tail might probably have been either absent or present in both, without interfering with the results. Had M. Isid. Geoffroy instituted an examination of the cranium of one of the common species of *Pteropi* at several periods of its growth, he would at once have seen that previously to attaining the full size it had the cerebral cavity of manifestly greater relative capacity than afterwards ; and coincidentally with this a greater thickness of the facial part is observable, but more especially a greater breadth between the orbits. My observations were first made from the examination of a series of skulls of *Pteropus poliocephalus* ; but I afterwards, to be quite satisfied that I was not noting a mere specific peculiarity, examined those of *P. edwardsii*, *P. edulis*, *P. rubricollis*, *P. hypomelanus* and *P. dasymallus*, and met with the same results. In the Pachysomes the same law also obtains, the skulls of the smaller species, such as *P. duvaucellii* which furnished M. Isid. Geoffroy with materials, having a relatively much greater cerebral region than those of the larger ones, such as *P. stramineum* and *P. ægyptiacum*. These latter, although possessed of tails, do not differ at all materially in the general conformation of their crania from the true *Pteropi*.

The same holds good with the crania of the *Epomophori*, but in a much greater degree. They vary from an exceedingly elongated form, as in *E. macrocephalus*, which has the facial part half its entire length, to a form which is remarkable for its shortness and convexity, and in which the facial part is scarcely more than one-fourth of its total length ; these skulls at the same time exhibiting no departure from the more important details of structure. For instance, all have the same shape and degree of development of the lower jaw, similar teeth, both in number and form, and similar modification of the form of the supra-orbital process of the frontal bone ; but those species in which the facial portion of the cranium is long, are the larger ones ; those in which it is short and thick, the smaller ones.

#### Genus EPOMOPHORUS, Bennett, 1835.

##### PACHYSOMA, Temminck.

General form of the body rather robust. The wings, ample in relation to the bulk of the body, are broad and rounded at the ends.

The breadth is in some measure occasioned by the fingers being more expanded than is usual in other *Pteropodidæ*, especially by the space between the index and longest finger being wider than is usual. The thumb, which is long, has its basal half enclosed in the antibrachial membrane, which further assists in giving greater breadth to the wing. The wings, as noticed by Mr. Bennett and Mr. Ogilby, are situated farther back than is usual in the allied genera, and the antibrachial membrane, maintaining its full breadth from the side of the body to the carpus, contributes also towards giving the base of the wings a backward appearance, whilst in *Pteropus* this membrane narrows as it approaches the wrist, and does not, therefore, bring that part so far forward in relation to the base as in *Epomophorus* \*. Another peculiarity in the organs of flight, remarkable as occurring in the Frugivorous Bats, but usual in the Insectivorous ones, is that their membranes spring at once from the sides of the body, instead of being attached along the sides of the vertebral column, more or less near to it in the different genera.

The form of the head varies very greatly in the different species of *Epomophori*, but the lips seem constantly to present that extraordinary amount of development which induced M. Temminck to apply to one of the species the specific name of *labiatus*. In so far as can be gathered from the inspection of these parts in skinned specimens, rendered soft for the purpose of examination, they appear to be quite simple—the lips of an ordinary *Pteropus* very much enlarged. There is nothing about the form of the nostrils which does not occur in the genera *Pteropus* and *Pachysoma*. The ears are rather small, simple, and ovoid.

The tail is rudimentary, scarcely more than a mere tubercle, and the interfemoral membrane margins the legs and coccyx as in *Pteropus*. The feet moderate, with the wing-membranes extending to the base of the toes, and attached to the upper surface of the second † one, as in *Pteropus* and *Pachysoma*.

With the comparatively greater development of the cutaneous system in *Epomophorus* is associated what may probably be regarded as a higher degree of development in the membranes themselves. Instead of the thick and leathery wings of the true *Pteropi*, they have membranes more or less translucent, and strongly marked with lines and papillæ, as in some of the Insectivorous genera. As the

\* I regret that I have not been able to examine specimens otherwise preserved than in skin, or mounted. In these it appears to me that the humerus is of great length in relation to the fore arm, and this, unless the wing be perfectly expanded, must bring the elbow in a more backward position than if it were shorter. When we consider that the wing-bones necessarily in all cases spring from precisely the same part of the body, it must be evident that the more backward appearance in one case than in another is due either to some modification in the form of the wings themselves, or to the mere elongation of the neck of the animal. In the excellent figure given by Dr. Peters of *E. crypturus*, the length of the humerus and peculiar form of the wings are well shown.

† The one next to the *outer* one in the ordinary position of the foot of a Bat, but in reality the one next the *inner* one of other Mammalia.

larger species of *Epomophori* approximate in size to the smaller species of *Pteropus*, a comparison of these parts may be easily made.

The fur is short and of a cottony texture, with but little difference in quality on the different parts of the body, that of the under parts being somewhat shorter and rather less soft than that of the upper. It is everywhere unicoloured from root to tip, and there are constantly two tufts of white fur at the base of the two margins of the ears, but not differing in quality from that of the other parts of the body. In some of the species the males are furnished with very remarkable tufts of long stiff hairs on the shoulders, usually of a yellowish or white colour.

In an examination of the crania of the several species of this genus some great peculiarities appear. If we take the skull of one of the most remarkable of them, *E. macrocephalus*, we shall be struck with the excessive length of the facial, and the extreme smallness of the cranial portions; but on examining the skulls of the other species these proportions are seen gradually to alter, until in the smallest one, *E. schoensis* (*Pteropus schoensis*, Rüpp.), they are actually reversed, whilst some other characters, more easily overlooked, will be found to be constant in all the species.

Mr. Ogilby observes that the upper jaw has but three molars (on each side), and the lower five, and that the first one in the upper jaw and the second one in the lower have so much the form of canines as to give the mouth the appearance of having four pairs of these teeth. On comparing the teeth with those of the ordinary *Pteropi*, the same prominent molars are easily recognisable in the latter, but, being less conical, they have not the canine-like appearance which Mr. Ogilby observed in *Epomophorus*.

I will now proceed to notice some real differences which exist in the dentition of the genera *Pteropus*, *Pachysoma*, and *Epomophorus*. The skull of the common *Pteropus edwardsii* will supply all that is necessary for the first of these genera.

*Upper jaw*.—On examining the upper jaw, the incisors and canines may be passed by as presenting nothing which is not common to the three genera. The next tooth following the canine is extremely small, and can be seen only in crania which bear evidences of immaturity; at a more advanced age it is lost. To this succeeds a large and prominent pre-molar, having somewhat the relative proportions, and holding the same position with regard to the following three molars, which the *carnassier* tooth does in the insectivorous genera. Then come the true molars, three in number, also as in the insectivorous species, but the hinder one so much reduced in size and abnormal in shape, as to be merely rudimentary. In *Pachysoma* the dentition of the upper jaw differs from that of *Pteropus* in the absence of the hinder or rudimentary molar, and in having the first or small pre-molar retained to a later period, perhaps permanently. In *Epomophorus*, on the contrary, it is wanting; but in one instance I can clearly trace a depression in the alveolus, which probably indicates the former presence of a tooth there, which, as in *Pteropus*, may be lost with age. Then comes the prominent tooth or *carnassier*,

like that of *Pteropus* and of *Pachysoma*, but rather more pointed, less angular, and having anteriorly a very canine-like appearance. The remaining teeth—restricted to two in number—are small and feebly developed, the hinder one the smaller of the two. The third or hinder one, which in *Pteropus* was but rudimentary, is here quite lost, and the one nearest to it has undergone a degradation in development corresponding with that of the one in *Pteropus*, which is absent.

*Lower jaw.*—In *Pteropus* we find in the lower jaw, omitting the incisors and canines, first a small and tubercular pre-molar, not often absent; second, a large and prominent pre-molar, shaped like the long one in the upper jaw; and third, another similar in form to the last, but less prominent. Three other teeth complete the number, and they gradually decrease in size to the hinder one, which is a mere tubercle with a flattened crown. The fourth tooth from the canine or the third one counting from behind, occupies the place proper for the *carnassier*, but that tooth exhibits no peculiarities of form. Reverting for comparison to *Pachysoma*, as before, the difference which we find in the dentition of the lower jaw from that of *Pteropus* assists in the numeration of the different kinds of teeth of the latter. We find the small anomalous pre-molar followed at a considerable interval in some of the species by a prominent and rather pointed tooth. Then comes another interval, followed by three teeth, the first of which is considerably longer than the other two, and more pointed. It has somewhat of the carnassial form, and is placed in the position proper for that tooth in relation to the two molars, whilst the tooth in front of it is here separated from those on either side like an ordinary pre-molar. The same dentition obtains in the lower jaw of *Epomophorus*, with this difference, that both molars are greatly reduced in size, being scarcely more than rudimentary.

From this it would appear that the Frugivorous Bats form an exception to the law which regulates the variation in the dentition of the Insectivorous ones, in which the true molars are liable to but slight variations in number or form, and in which the pre-molars suffer considerable modifications, not merely in the several genera, but even in the different species in the same genus. It is possible that the pre-molars may be in reality absent in this group, and their places taken by modified true molars, and by this means the proper number of the latter preserved. But this is rendered improbable, if not actually disproved, by the fact that the absence in one genus (*Pachysoma*) of the third true molar is predicted by its rudimentary condition in another (*Pteropus*), in which the proper number of true molars certainly exists. And this partial development of the molar series may be traced yet further in those genera which have lost the third molar, and in which the second molar has assumed in some measure the abnormal form and size of the third or missing one.

Besides the abridgment in number, and imperfect development of the molar teeth, the cranium of *Epomophorus* exhibits certain other peculiarities worthy of note. It is altogether a fragile structure, the upper maxillary bones in some of the species being so thin and

translucent that it is easy to see through their outer walls the form of the enclosed roots of the molar teeth ; and if held up against a lamp, the light will readily pass through both their outer and palatal portions. A similar lightness of structure obtains everywhere. The supra-orbital process of the frontal bone is small and directed more backwards than in *Pteropus* ; so small in *E. schoensis* that it can scarcely be called a process \*. The zygoma throws up no process to meet that of the frontal, so that in those species where the process of the latter bone is wanting the orbit is continuous with the temporal fossa, as in the generality of the Insectivorous genera, and as in other orders of Mammalia. Viewing the skull from beneath, it exhibits some other peculiarities. The auditory bullæ are, as in *Pachysoma*, more developed than in *Pteropus*, and the hinder margin of the palate is but very slightly curved, but has the appearance of a transverse ridge more or less raised from the level of the palate.

The lower jaw, besides being exceedingly thin everywhere, has its alveolar or anterior part extremely narrow in a vertical direction. Its posterior part is remarkable for the almost entire absence of ridges or other roughness for the attachment of muscles, and for the form of the angular portion. The lower margin of each ramus is very nearly straight from the lower part of the *symphysis menti* to the angle, which forms a simple curve up to the condyle. In the different species this curve is of different degrees of sharpness, most pronounced in *E. franqueti*, n. s., and least so in *E. schoensis*. In none of them does the angular region project so far back as the condyle. The coronoid process is elevated about as much above the condyle as the latter is above the lower margin of the ramus. Its anterior boundary runs obliquely forward with an easy descent to the posterior molar, constituting, in fact, more than half of the entire length of the upper margin of the jaw.

I will now offer a few suggestions relative to the probable nature of the food of the *Epomophorus*. In the *Desmodus*, where there is absolutely no mastication required, the true molars are wholly wanting ; and the pre-molars, although not reduced to the minimum number, are diminished to a very rudimentary condition. It happens that in this genus the zoologist has the opportunity, rarely met with in this order, of comparing singularity of structure with habits known to be of a most extraordinary nature, so extraordinary as to be unique among Mammalia, and, as far as I know, among the whole of the Vertebrata ; and he can at once discern the exact adaptation of the one to the other. But without information concerning the habits, would he by a mere inspection of the teeth have inferred them ? I think not. He would indeed infer, from the absence of molars, that the creature did not eat food requiring mastication ; and the form and character of the incisors and canines would clearly point to some food requiring to be cut or torn ; but it would scarcely occur to him that they were intended to puncture the skin of such animals as horses, and enable the creature by a suctorial operation to feed on

\* Being produced in a backward direction, it may be said to be adherent to the body of the bone, rather than to be wholly absent.



their blood. And if, in the absence of evidence of its sanguivorous habits, the investigator had compared the dentition of *Desmodus* with that of any of the *Felidæ*, in which the molars are reduced in number, and the premolars and canines greatly developed for the purpose of tearing flesh, he would very possibly have supposed that there was some analogy between the two, and that the one was a modification of the other, each being fitted to the insectivorous or carnivorous type of structure, on which their respective orders are supposed to be based. We are in pretty much the same position with regard to the habits and food of the *Epomophorus*, and can at best only indicate the kind of diet which would be within the management of its teeth. Although there is not, as in *Desmodus*, a complete absence of molar teeth, yet they are so imperfect that we are forced to conclude that they are not fitted for the purpose of mastication, in the ordinary sense of the word; but we cannot make any use of our subsequent knowledge of the habits of *Desmodus* as any argument in the case of *Epomophorus*, because the general structure of the latter proclaims that it strictly pertains to the *Phytophagous* type, whilst that of the former is as strictly *Zoophagous*. Moreover, the habits of *Desmodus* being understood, and the several peculiarities in its structure found in perfect unison with them, it becomes extremely easy to see that it is only in the one respect of having merely rudimentary molars that *Epomophorus* bears any resemblance to *Desmodus*. Instead of large and trenchant incisors, suitable to serve the purpose of lancets, these teeth in *Epomophorus* are small and blunt; and the premolars, instead of being rudimentary, are, on the contrary, some of them so developed as to have equal prominence with the canines. But, notwithstanding this, we are still precluded from supposing that the creature could subsist on food requiring mastication, properly speaking; and the question is, what is the kind of food for which the dentition of *Epomophorus* is specially adapted?

If, in speculating on the uses of the peculiar dentition of *Desmodus*, we happened to make further examination of the parts connected with it, we should be able to decide that while the teeth might perform the office of lancets, the lips were modelled to the office of a cupping-glass, and that the whole constituted an apparatus admirably adapted to the sanguivorous habits attributed to the creature.

The *Epomophorus* is furnished with lips quite as extraordinary as those of the *Desmodus*. Although simple in form, they are of such enormous size as to hang down on each side of the face, almost an inch in some of the species; so large are they, that the mouth may be sewn up, and the jaws yet move to the full extent that their construction seems to warrant; and this, as it appears to me, affords some index as to the nature of the food. If for the food of the ordinary *Pteropi* we were to substitute some fruit of an exceedingly succulent nature, which would require but a trifling pressure to yield its juices, less strong molars would be needed, and consequently jaws of much less strength for their implantation, whilst the muscles required to work the jaws would be equally reduced in volume. All this we find in *Epomophorus*, and much more, contributing to strengthen

the suggestion. The voluminous lips would do good service during the squeezing operation, by preventing the escape of the juices, and very possibly the prominent rim across the back part of the palate might assist in constricting the mouth posteriorly, until a sufficient amount of fluid was collected to be swallowed, the more solid parts being rejected. The only suggestion I can make concerning the long and canine-like premolars is, that they may assist in gathering the fruit; but it should be remembered that the *Pteropi*, proper, have these teeth considerably developed, and therefore their prominence in *Epomophorus* must not be dwelt upon too strongly.

Dr. Andrew Smith says of *Pteropus leachii* that it repairs to Cape Town and its vicinity when the grapes are ripening, from which we are led to suppose that this fruit constitutes at that time their food. The *Epomophori* would be peculiarly fitted for such a régime as this, but we have at present no positive evidence that the grape is actually their food.

#### 1. *EPOMOPHORUS MACROCEPHALUS*, Ogilby, sp.

*Pteropus macrocephalus*, Ogilb. Proc. Zool. Soc. iii. p. 101, July 1835; Wagn. Supp. Schreb. Säugeth. i. p. 367, 1840; Schinz, Synop. Mamm. i. p. 135, 1844.

*Pt. epomophorus*, Bennett, Proc. Zool. Soc. iii. p. 149, Oct. 1835; Wagn. Supp. Schreb. i. p. 367, 1840.

*Pt. megagephalus*, Swains. Nat. Hist. & Class. Quad. p. 92, 1835.

*Epomophorus whitei*, Bennett, Trans. Zool. Soc. v. 2. p. 38. pl. 6, Oct. 1835; Gray, Mag. Zool. Bot. ii. p. 504, 1838; Cat. Mamm. Brit. Mus. p. 38, 1843.

*Pachysoma whitei* et *P. macrocephala*, Temm. Esquiss. Zool. Côte Guinée, pp. 65 et 70, 1853.

I regret that I am unable to continue the specific name first associated with the generic one now made use of, but that given to the female of the species by Mr. Ogilby has unquestionably the priority, and must therefore be adopted. Of the names given by Mr. Ogilby and Mr. Swainson it is impossible to say which has the precedence; I have therefore chosen that which appears most appropriate.

Of all the species this one appears to typify most strikingly the genus *Epomophorus*. The head is very long, or rather the face, the distance from the eye to the nose being fully twice that of the distance from the eye to the ear. The nostrils are somewhat tubular, and a deep notch passes vertically between them, dividing the upper lip in half. As far as can be gathered from dried specimens, the lips attain in this species their full development, being perfectly capable, when softened, of distention to fully three times the extent of those of *Pteropus rubricollis*, a species of nearly similar size. The ears are small, ovoid, and narrowed at the tip, and, with the exception of two tufts of white hair, naked; these tufts are of fine short hair, and are placed at their two borders, quite at the root.

The antibrachial membrane is broader than in the other species, being as much as 8 or 9 lines at the elbow, and nearly as much where

it encloses the thumb. The interfemoral membrane margins the coccyx and legs, and is at the *os calcis* not more than 2 lines wide, at the coccyx the same, but at the knee as much as 5 lines wide.

All the face is covered with very short fine hair, with the exception of the muzzle, chin, and edges of the lips, which are naked. On the upper lip, towards the end of the nose, are a few scattered longish bristle-like hairs. The fur of the back extends on to the fore-arm for half its length, on to the hinder limbs for nearly the whole of their length, and on the membranes of the flanks for the breadth of half an inch. Nearly the whole of the interfemoral membrane has its upper surface hairy, the exception being at the *os calcis*. Beneath, the fore-arm membranes of the flanks and legs are similarly hairy, but more sparingly so, especially those of the latter.

Both above and beneath, nearly all that part of the wing-membranes which is between the last finger and the body is studded with rows of glandular dots, each bearing a little bundle of short hairs, most regular on its upper surface. All the other parts of the membrane are semi-opaque, and rather distinctly veined.

The fur of all parts of the body is short and soft, above longer and thicker than beneath; it is unicolour, and of a lightish cinnamon-brown, with an ill-defined oval patch on the abdomen of a cream colour. At the base of the ears are two little patches of soft white fur, just on their margins; and on the shoulder is the remarkable tuft of long white hairs which was first noticed by Mr. Bennett, and at that time regarded as peculiar to the species.

In the following table of dimensions, No. 1 refers to the type specimen of *E. whitei*, and No. 2 to the type specimen of *E. macrocephalus*.

	1.	2.
Length of the head and body . . . . .	7 0	6 3
— of the head . . . . .	2 0	2 2
— from the eye to the end of the nose . . . . .	1 3	1 2
— from the eye to the ear . . . . .	0 5	0 4 $\frac{3}{4}$
— of the ears . . . . .	0 8	0 8
Breadth of the ear . . . . .	0 5 $\frac{1}{2}$	0 5 $\frac{1}{2}$
Length of the fore-arm . . . . .	3 3	3 3
— of the longest finger . . . . .	6 0	5 8
— of the fourth finger . . . . .	4 7	4 4
— of the thumb . . . . .	1 6	1 4 $\frac{1}{2}$
— of the tibia . . . . .	1 4 $\frac{1}{2}$	1 3 $\frac{1}{2}$
— of the foot and claws . . . . .	0 11	0 11
Expanse of wings . . . . .	22 5	21 6*

\* The spread of the wings is never a very satisfactory dimension in the *Cheiroptera*, for in such species as those constituting the present genus, in which the wings are broad and the fingers much curved, it is obvious that the real expanse of the wings is not given by following their curvature. On the other hand, if the measure taken be a straight line between the tips of the open wings, that line must necessarily vary in length with the degree to which they are opened—

Some peculiarities are noticeable in the cranium of this species, which, if not confined to it, are certainly not extended to all the others, and therefore cannot be mentioned as strictly generic. The palate in this genus, as has already been stated, is remarkable for the prominence of its hinder margin; this appears to be properly a generic character, but it is the present species which possesses it in the greatest degree, and with it a great curvature of the back part of the palate from side to side also, giving that part of the mouth a pretty complete dome-shape\*. It is further characterized by the presence of very widely separated transverse ridges. If the mouths of any of those species of *Pteropi* be examined which are affine to the common *Pt. edwardsii*, they will be found to have ten or a dozen transverse palatal ridges; and in a fresh specimen of *Pachysoma stramineum*, a species more affine to *Epomophorus*, I have counted as many as nine; but in *E. macrocephalus* there are not more than six, and, if the great length of this part of the skull be borne in mind, it will be readily seen that they are far apart. But the deficiency in number is compensated for by their great thickness and prominence. The first is straight, and placed just behind the incisive foramen, and has a central projection; the second is also straight, but instead of a projection has a central notch, and is situate between the first pair of premolars; the third is strongly curved forwards, and is a simple entire ridge extended between the first pair of true molars; the fourth is considerably removed from the third, is equally curved and projecting, and has a more or less flattened surface; the fifth is of very peculiar form, being lozenge-shaped, with a central pit, and placed across the palate between the anterior roots of the zygomatic arches; the sixth and last is straight and transverse, but little raised, and is notched in the centre. Immediately behind this last one comes the deep dome-shaped hollow already noticed.

## 2. EPOMOPHORUS GAMBIANUS, Ogilby, sp.

*Pteropus gambianus*, Ogilby, Proc. Zool. Soc. pt. 3. p. 100, 1835; Wagn. Supp. Schrub. Säugth. i. p. 366, 1840; Schinz, Synop. Mamm. i. p. 135, 1844.

*Epomophorus gambianus*, Gray, Mag. Zool. Bot. ii. 504, 1838.

*Epomophorus crypturus*, Peters, Natur. Reise Mossam. Säugth. p. 26. t. v. u. xiii. 1852.

*Pachysoma gambianus*, Temm. Esquiss. Zool. p. 69, 1853.

This species differs considerably in appearance from the last in consequence of its much shorter head. The muzzle is in fact scarcely more produced than that of the ordinary *Pteropi*, and the eye

vary, in fact, with the fancy of the preserver. On the whole, therefore, it appears desirable to adopt the first of these methods. The actual expanse of the open wings of these specimens is not more than 17 or 18 inches. Mr. Bennett gives 12 inches as the expanse of the specimen which has furnished the dimensions in Column I, which, as M. Temminck justly observes, is certainly an error.

\* This peculiar form of the palate has most probably reference to the nature of the food.

scarcely more distant from the nose than from the ear. It resembles in this respect the well-known *Pachysoma stramineum*. In the form of the ears, lips, nostrils, and indeed of all other parts *taken in detail*, this species is so much like the last that it will be only necessary to mention a few trifling differences, and then proceed to give the more important ones of dimensions. The fur in its general character and quality is similar to that of the last species, but it is a little more strongly tinged with cinnamon, and rather less spread on to the membranes. There is the same obscure patch of whitish colour on the abdomen, and the ears are similarly furnished with tufts of white fur at the bases of their two margins, but the conspicuous shoulder tufts of *E. macrocephalus* are here very fully developed. They consist of a very slight warty excrescence clothed with fur, which differs from that which surrounds it only in being of a dirty-white colour. The membranes are a little more translucent, and somewhat paler in colour, than those of *E. macrocephalus*.

The teeth vary but little from those of *E. macrocephalus*, but the cranium itself has the facial part much shorter, and it is further remarkable for the slight extension of the supra-orbital process\*. Unfortunately, in all the crania I have seen, the hinder margin of the palate has been destroyed in the process of preservation, so that I am able to notice only such of the transverse palatal ridges as are not posterior to the molar range. These are more simple in form than in the last species, but are equally prominent, and placed in relation to the teeth just as in that species.

The following dimensions are those of three specimens which formerly formed part of the Museum of the Zoological Society:—

	1.	2.	3.
Length of the head and body . .	5 9	6 0	5 9
— of the tail . . . . .	0 2	0 1½	0 1½
— of the head . . . . .	1 10½	2 0	1 11
— from eye to snout . . . .	0 11	1 0	1 1
— from ear to eye . . . . .	0 6	0 5½	0 4½
— of the ears . . . . .	0 9	0 9	0 9
Breadth of the ears . . . . .	0 6	0 6	0 6
Length of the fore-arm . . . . .	3 1½	3 2½	3 0
— of the longest finger . .	5 9	6 0	5 10
— of the fourth finger . . .	4 4	4 5	4 5
— of the thumb . . . . .	1 3	1 3	1 4
— of the tibia . . . . .	1 4	1 4	
— of the foot and claws . .	0 10	0 10½	0 10½
Expanse of wings, following the phalanges . . . . .	22 3	22 8	21 0

*Hab.* Gambia, Mozambique (*Peters*).

\* For these details I refer the reader to the excellent figures of the cranium of this species given by Dr. Peters under the name of *E. crypturus*.

### 3. EPOMOPHORUS FRANQUETI, n. sp. (Pl. LXXV.)

If the species in the present monograph took rank according as they are more or less typical in form, the present one should appear as second, the *E. labiatus* probably as third, followed by *E. gambianus*, and the list should be completed by the smallest and least typical species—*E. schoënsis*. But the first and most typical species is succeeded by the one which was described at very nearly the same time, as being much better known than those which were to follow.

The present one is much the largest species, attaining an expanse of more than 2 feet, and has the same singular tufts of hair on the shoulders as are recorded of the first species in the list—*E. macrocephalus*, but much more developed than in that species, and of a pale yellow colour. The only known specimen was forwarded to the French National Collection by Dr. Franquet of the French Imperial Navy, and from it I have, by the kind permission of M. Geoffroy St. Hilaire, taken the description which follows, and have had a carefully executed drawing made by M. Oudart, from which the illustrations accompanying the present paper have been copied. Its country is the same as that of the Gorilla.

The head is not nearly so long and narrow relatively as that of *E. macrocephalus*, but more nearly resembles that of *E. gambianus*. The ears, as in the other species of the genus, are of medium size, oval, and a little narrowed towards the tips; they are furnished with small tufts of fine white hair at the base of their inner and outer margins, like those of all the other species here described. The lips, as far as can be ascertained from the inspection of a mounted specimen, are large, although perhaps not quite equal to those of some of the other species. The interfemoral membrane is rather more ample than is usual in the genus.

The fur extends considerably on to the membranes, above and below, as in *E. macrocephalus*, and it is similarly unicolour, and possesses the same soft cottony texture. That of all the upper parts is of a cinnamon-brown colour, brighter and deeper than in the other species; the under parts similar, but the patch of whitish on the abdomen, which is faint as in the others, here takes the form of a clearly-defined oval space of pure white, as much as  $2\frac{1}{2}$  inches long.

The shoulder tufts are very much developed, and differ somewhat from those of *E. macrocephalus*. They occupy a space on the shoulder of as much as  $1\frac{1}{2}$  inch in length, in a descending direction; the lower half of this space consists of fur, which is of the same length and texture as that of the surrounding parts, but is of a buffy-yellow colour; whilst the upper part, constituting the real shoulder tuft, is composed of long yellow hairs, which spring outwards, and then curve downwards, partially hiding the short yellow hair already mentioned. All this yellow fur, both long and short, has a clear and well-defined outline. All the membranes are of a darkish cinnamon-brown.

The cranium is much less elongated than in either of the preceding species, and in its general proportions bears some resemblance to that

of *Pachysoma stramineum*, especially in the expansion of the zygomatic arches; but the teeth are of precisely similar number and relative proportion with each other, as in *E. macrocephalus*, although they are generally stouter than in that species. The lower jaw exhibits most unequivocally the peculiarities mentioned in detailing the generic characters. The dimensions of the cranium will be given with those of some of the other species, so as to afford a more direct means of comparison.

Length of the head and body . . . . .	7	3
— of the head . . . . .	2	8
— of the ears . . . . .	0	10
— of the fore-arm . . . . .	3	9
— of the longest finger . . . . .	7	3
— of the fourth finger . . . . .	5	6
— of the tibia . . . . .	1	6
— of the foot and claws . . . . .	0	11
Expanse of wings, about . . . . .	30	0

*Hab.* Gaboon.

#### 4. EPOMOPHORUS LABIATUS, Temm., sp.

*Pteropus labiatus*, Temm. Mon. ii. p. 83. pl. 39, 1835-1841; Wagn. Supp. Schreb. Säugeth. i. p. 356, 1840; Less. Nouv. Tab. Règ. Anim. p. 13, 1842; Schinz, Synop. Mamm. i. p. 128, 1844.

*Pachysoma labiatus*, Temm. Esquiss. Zool. p. 68, 1853.

*Epomophorus whitei*, Gray, Cat. Mamm. Brit. Mus. p. 38, 1843.

Of this species, which has been considered by some zoologists as identical with the *E. macrocephalus*, I can only quote the words of M. Temminck, since I have not been able to take a description of it. Judging from the little that could be learned from an inspection of specimens without removing them from the case, I feel satisfied that the species is distinct; and, in order to make this monograph as complete as possible, I borrow the following description from M. Temminck's 'Monograph':—

Ears long and pointed; interfemoral membrane hidden in the fur, which covers a great part of the membrane; the lips large enough to hang several lines below the lower margin of the jaw, and entirely hide the line of the mouth laterally, as in some of the dog kind; the fur of the upper parts covering also in some measure the humeral region, and that part of the membrane near the flanks.

The fur cottony on all parts of the body, especially on the back; more sleek on the under parts. That which extends on to the membrane, and that on the top of the head, short and rough, and of a reddish-isabelle colour, more reddish towards the back. The two margins of the ears with white fur at their bases. Side of the neck reddish-brown, with two shoulder tufts of ample size, and composed of long white hairs which radiate from the centre of a glandular prominence; breast, humeral region, flanks, and region of the coc-

cyx pale rufous; middle of the belly covered with short hair, smooth, and dirty white.

The female, M. Temminck says, does not differ very greatly from the male, excepting in wanting the shoulder tufts, and in not having the great development of lips. From this it would seem that the latter peculiarity is sexual, which appears highly improbable if we admit that the greatly developed lips have a determinate function to perform, which could scarcely differ much in the two sexes. Moreover it is further rendered improbable by the facts that in the other species of the genus the peculiarity exists equally in both male and female.

Total length (English) . . . . .	4	4	5
Fore-arm . . . . .	2	6	
Expanse of wings . . . . .	16	0	

*Hab.* Abyssinia.

My note of the species made in the Leyden Museum is as follows:—"Much smaller than *E. macrocephalus*, and with the face relatively much shorter; shoulder tufts as in that species; size about that of *Pachysoma amplexicaudatum*."

5. *EPOMOPHORUS SCHOËNSIS*, Rüpp., sp.

*Pteropus schoënsis*, Rüpp. Mus. Senck. iii. p. 131, 1842; Schinz, Synop. Mamm. i. p. 129, 1844.

Dr. Rüppell observes of this species, that he had some doubts whether it might not be the young of the *Pteropus whitei* of Bennett, the incisor teeth of one of the specimens bearing indications of immaturity, but that some disparities in the proportions induced him to regard it as distinct.

At the dispersion of the Museum of the Zoological Society, two specimens of a small species of Frugivorous Bat, labelled "Gambia," fell into my hands, which I had no difficulty in identifying with the species described by Dr. Rüppell under the above name. Afterwards I met with another specimen in the Paris Museum which had been received from Gaboon with the specimen of *E. franqueti* already described. These examples have furnished the materials for the following description.

It is a miniature of *E. gambianus*, being the smallest of the *Pteropodidæ*, save the *Kiodote*, and has a shorter and more rounded head and shorter muzzle. These parts are somewhat similar to the same parts in *Pachysoma brevicaudatum*, and indeed the two species hold precisely the same position in their respective genera. *E. schoënsis* bears pretty closely the same relationship to *E. franqueti* as *P. brevicaudatum* does to *P. stramineum* and *P. ægyptiacum*.

As in those already described, this species has the two ear-tufts; the ears too are themselves so similarly proportioned as to need no particular description. The fur, like that of *E. gambianus*, extends on to the membranes, and in a perfectly similar manner, and in texture and colour agrees so well with that of that species as to re-



quire no further mention, except to notice the total absence of the whitish patch on the under parts, where the fur is of a uniform greyish-brown colour. With the exception of this difference, *E. schoënsis* might, as far as external appearance is concerned, be fairly described by stating it to be a pigmy *E. gambianus*.

The cranium requires special mention. It is short, and has the cerebral region rounded and devoid of crests or ridges, and instead of being, as in the more typical forms, shorter than the facial portion of the skull, it is longer, that part in front of the orbit not being more than half the length of that which is behind it. But while its general outline is less typical of the form of cranium which characterizes the genus, the parts taken in detail are not less typical. Thus the small development of the supra-orbital process, taken as a characteristic feature of the genus, is more remarkable in this species than in any other. It may be said to be directed backwards, and adherent, so that only an extremely small point is free. The space between the orbits is much wider in relation to the size of the skull than in the larger species. The palate, instead of having transverse ridges and furrows, is smooth, with a slight prominence behind the canines, of a hastate form, with the point directed backwards; behind this is a shallow depression of similar form, with its point extending almost to the hind margin of the bony palate. On each side of this point, and just within the raised rim which bounds the palate, are two ovoid smooth hollows.

The following are the dimensions of the two specimens from Gambia:—

Length of the head and body . . . . .	3	5	2	11
——— of the head . . . . .	1	3.	1	2
——— from nose to eye . . . . .	0	6	0	5½
——— from ear to eye . . . . .	0	4	0	3
——— of the ear . . . . .	0	6	0	6
——— of the fore-arm . . . . .	2	1	1	11
——— of the longest finger . . . . .	3	9	3	3
——— of the fourth finger . . . . .	2	9	2	6
——— of the thumb . . . . .	0	10	0	8
——— of the tibia . . . . .	0	10	0	9½
——— of the foot and claws . . . . .	0	8	0	7
Expanse of wings, following the phalanges . . . . .	14	0	12	6

*Hab.* Abyssinia, Gambia, Gaboon.

The following table will show the difference in size and proportion of parts of the crania of the species described in this Monograph, with the exception of *E. labiatus*:—

	<i>E. macrocephalus.</i> in. lines.	<i>E. franqueti.</i> in. lines.	<i>E. gambianus.</i> in. lines.	<i>E. schoënsis.</i> in. lines.
Length from the extremity of the nasal bones to the occipital crest .....	.....	1 11	.....	1 0
Length from extremity of nasal bones to the front of orbit .....	1 0	0 9	0 10	0 3 $\frac{2}{3}$
Length from extremity of nasal bones to the supra-orbital foramen .....	1 4	.....	1 1	0 5 $\frac{1}{2}$
Length of the nasal bones .....	0 11	.....	0 9	0 3
Length of the zygomatic arches, taken from the ant-orbital foramen to the hinder margin of the condyloid fossa	1 0	0 10	0 10	0 5 $\frac{2}{3}$
Breadth across the zygomatic arches...	1 0	1 2	0 11	0 7 $\frac{1}{4}$
Breadth taken between the points of the supra-orbital processes.....	0 9 $\frac{1}{2}$	0 7	0 7	0 4 $\frac{1}{2}$
Length of the bony palate .....	1 5	.....	.....	0 5 $\frac{1}{2}$
Length from the point of the canine to the posterior molar.....	0 9 $\frac{3}{4}$	0 8 $\frac{1}{4}$	0 8	0 4
Breadth between the two posterior molars .....	0 5	.....	0 4 $\frac{1}{2}$	0 3
Breadth between the points of the canines.....	0 3 $\frac{3}{4}$	.....	0 3 $\frac{1}{2}$	0 2
Entire length of the lower maxilla ..	1 11 $\frac{3}{4}$	1 7	1 7	0 9 $\frac{1}{2}$
Height at the coronoid ... ..	0 9 $\frac{1}{4}$	0 7 $\frac{1}{4}$	0 7	0 3
Length from point of canine to posterior molar .....	0 10 $\frac{1}{2}$	0 9	0 9	0 4 $\frac{1}{4}$

2. DESCRIPTION OF A NEW SPECIES OF OPOSSUM, OBTAINED BY MR. FRASER IN ECUADOR. BY ROBERT F. TOMES.

(Mammalia, Pl. LXXVI.)

*DIDELPHYS WATERHOUSII*, n. s.

*Fur rather long, soft, and of a cotton-like texture; general colour dark brownish-grey, tipped with rufous on the sides; under parts brownish-buff, with a stripe of yellowish-white along the centre of the throat and breast. A black mark through the eye, to near the end of the nose.*

Muffle of a broadly ovoid form, more deep than wide, the oval figure truncated at the bottom, where the upper lip constitutes its base; notch of the upper lip, occasioned by the mesial groove of the muffle, deep; on either side of it, in the edge of the lip, a double cleft. A horizontal depression passing through the centre of the muffle, serves, with the vertical groove, to divide it into four divisions or quarters, of which the two upper ones have a somewhat discoid form, and project laterally over the nostrils, partially hiding them. The two lower ones are marked, each with two oblique shallow depressions, passing from near the centre of the muffle to its outer margins, near the base.

Ears broadly ovoid, hairy on their hinder surface, at the base only, and of a dark brown colour, tinged with yellow at the auditory opening. Feet of a pale fleshy-brown colour, suffused with exceedingly fine short hairs, scarcely visible to the naked eye, but becoming



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DIDELPHUS WAIWANGUEN



thicker and longer on the upper surface of the fore feet. Nails small and nearly white, each with a tuft of straight hairs springing from their bases.

Tail of a uniform dark brown colour for the whole of its length\*, and with the scales very indistinctly marked. Hairy portion at its base not exceeding half an inch in length.

The fur of the upper parts approaches to half an inch in length, and is of a dark grey colour, tipped with brown, which passes into a buffy-brown on the sides of the body. Outer surface of the limbs, the occiput, a space in front of the ear, and the fur on the base of the tail, of the same colour as the back. Around the eye a black mark, of small extent beneath and behind it, more extended above it, but most so in the direction of the snout, which it approaches very nearly. On the forehead the fur is pale brown, having the appearance of a pale streak between the two black marks. On all the under parts the hairs are unicolour, of a pale buff, palest on the mesial line, and on the throat and breast taking the form of a well-defined streak of pale yellow. Cheeks, chin, and lips buffy-brown.

Length of the head and body, about . . . . .	6	0
— of the tail, about . . . . .	7	6
— of the head . . . . .	1	7
— from nose to ear . . . . .	1	2
— from nose to eye . . . . .	0	5 $\frac{3}{4}$
— of the ears . . . . .	0	7
Breadth of the ears . . . . .	0	7
Length of the humerus . . . . .	0	9
— of the fore arm . . . . .	1	1
— of the fore foot . . . . .	0	7
— of the femur . . . . .	1	0
— of the tibia . . . . .	1	4 $\frac{3}{4}$
— of the hind foot . . . . .	0	10
Total length of skull . . . . .	1	5 $\frac{1}{2}$
Breadth across the zygomatic arches . . . . .	0	10
From front of foremost incisor to back of last molar . . . . .	0	8
Length of the nasal bones . . . . .	0	8
— of the zygoma from its posterior root to the front margin of the orbit . . . . .	0	8
Breadth of the palate between the canines . . . . .	0	2
— — — — — between the two hinder molars . . . . .	0	3 $\frac{1}{2}$
Length of the lower jaw . . . . .	1	0
Height from the posterior angle to the top of the coronoid process . . . . .	0	5
Length of the dental series in the lower jaw . . . . .	0	8

The young have all the under parts and inner surfaces of the

\* Such is the appearance of the tail after being skinned and immersed in spirits; but Mr. Fraser's note of this animal is to this effect:—"Nose and feet pale flesh-colour, ears and tail a little darker." The young have the terminal two-thirds of the tail of this colour, after having been skinned and sent home in spirits.

limbs naked, and of a brownish flesh-colour. All the upper parts dark grey, almost black; the hairs short, shining, and adpressed. Basal third of the tail of the same colour, and similarly clothed with fine hairs; terminal two-thirds pale flesh-coloured, dusted with exceedingly fine white hairs, scarcely visible without the aid of a lens. Ears darkish flesh-colour, with both their surfaces well clothed with short and fine hairs of a silvery-grey colour. Nails white.

Length of the head and body, about . . . . .	$\frac{3}{4}$	$\frac{6}{16}$
——— of the tail, about . . . . .	3	0
——— of the head . . . . .	1	5

*Hab.* Gualaquiza. Collected by Mr. Fraser, Dec. 1857.

*Obs.*—This species was first described by Mr. Waterhouse in his excellent work on ‘Mammalia’\*, but without a name, and was compared with *D. cinerea*, from which it was observed to differ in having the hairy portion of the tail of much less extent, in having longer fur, and in being itself considerably smaller. The specimen examined was a male, and included in that section of Opossums characterized by a pouch “rudimentary, or entirely wanting;” but the female obtained by Mr. Fraser (evidently of the same species) unquestionably possessed a complete pouch, as might be seen from an examination of the skin preserved in spirit; and Mr. Fraser’s note accompanying the specimen informs us that there were “five young in her pouch, each 3 inches long.”

This effectually disposes of the question as to its distinctness from *D. cinerea*, and in fact removes it to the other section.

To *D. noctivaga*, Tschudi, it bears some resemblance, in which species, as in *D. waterhousii*, the fur on the base of the tail is of exceedingly limited extent, and both agree in having rather long fur, although of a different colour. But *D. noctivaga* is the larger species of the two, and is quite differently proportioned. Its muzzle is a great deal longer than that of *D. waterhousii*, and the ears are much larger. Moreover the female is destitute of a pouch, and has in its stead “abdominal folds of the integuments.” The eyes too, according to Dr. Tschudi’s figure and Mr. Fraser’s note, are of a different colour.

Mr. Fraser’s note in full is as follows:—“♀ had five young in her pouch, each 3 inches long. Nose, chin, and latter half of the tail flesh-colour, ears black. Stomach contained bones of a small mammal, hair, and a pulp containing a vegetable substance. Eyes black. Xivaro name ‘*Juichma*.’”

I have named this animal after its original describer, as a tribute to a zoologist who has in such an eminent degree extended our knowledge in this branch of natural history.

It is alluded to, but not described, in my list of Mr. Fraser’s Mammals, given in last year’s ‘Proceedings’ (p. 548).

\* vol. i. p. 505.

3. NOTES ON SEMIOPTERA WALLACII, GRAY, FROM A LETTER ADDRESSED TO JOHN GOULD, ESQ., F.R.S., BY A. R. WALLACE, ESQ., DATED AMBOYNA, SEPT. 30, 1859.

"The *Semioptera wallacii* frequents the lower trees of the virgin forests, and is almost constantly in motion. It flies from branch to branch, and clings to the twigs and even to the vertical smooth trunks almost as easily as a Woodpecker. It continually utters a harsh croaking cry, something between that of *Paradisea apoda* and the more musical cry of *Cicinnurus regius*. The males, at short intervals, open and flutter their wings, erect the long shoulder feathers, and expand the elegant shields on each side of the breast. Like the other Birds of Paradise, the females and young males far outnumber the fully plumaged birds, which renders it probable that the extraordinary accessory plumes are not fully developed until the second or third year. The bird seems to feed principally upon fruit, but it probably takes insects occasionally.

"The iris is of a deep olive; the bill horny-olive; the feet orange, and the claws horny.

"I have now obtained a few examples of apparently the same bird from *Gilolo*; but in these the crown is of a more decided violet hue, and the plumes of the breast are much larger."

4. NOTES ON THE YOUNG OF MENURA SUPERBA. BY LUDWIG BECKER, ESQ., IN A LETTER TO JOHN GOULD, ESQ., F.R.S., ETC., DATED MELBOURNE, VICTORIA, SEPT. 24, 1859.

"In the month of October 1858 the nest of a Lyre-bird was found in the densely wooded ranges near the sources of the river Yarra-Yarra. It contained a bird, which seemed at first to be an old one in a sickly condition, as it did not attempt to escape; but it was soon discovered to be a young bird of very large size as compared with its helplessness. When taken out of the nest it screamed loudly; the note being high and sounding like 'tching-tching.' In a short time the mother bird, attracted by the call, arrived, and, notwithstanding the proverbial shyness of the species, flew within a few feet of its young, and tried in vain to deliver it from captivity by flapping her wings and making various rapid motions in different directions towards the captor. A shot brought down the poor bird, and with its mother near it the young *Menura* was soon silent and quiet. It was taken away and kept at a 'mia-mia' erected in the midst of the surrounding forest. The following is as correct a description of the bird as I can give you:—

"Its height was 16 inches; the body was covered with a brown down, but the wings and tail were already furnished with feathers of a dark brown colour. The head was thickly covered with a greyish-white down of from 1 to 2 inches in length; the eyes were hazel-brown; the beak blackish and soft; the legs nearly as large as those of a full-grown specimen, but it walked most awkwardly with the legs bent inwards. It rose with difficulty, the wings as-

sisting, and when on its legs occasionally ran for a short distance, but often fell, apparently from want of strength to move the large and heavy bones of its legs properly. It constantly endeavoured to approach the camp fire, and it was a matter of some difficulty to keep it from a dangerous proximity to it. Its cry of '*tching-tching*' was often uttered during the day time, as if recalling the parent bird; and when this call was answered by its keeper, feigning the note '*bullen-bullen*,' the native name for the Lyre bird, and which is an imitation of the old birds' cry, it followed the voice at once, and was easily led away by it. It soon became very tame, and was exceedingly voracious, refusing no kind of food, but standing ready with widely gaping bill awaiting the approaching hand which held the food, consisting principally of worms and the larvæ of ants, commonly called '*ants' eggs*;' but it did not refuse bits of meat, bread, &c. Occasionally it picked up ants' eggs from the ground, but was never able to swallow them, the muscles of the neck not having acquired sufficient power to effect the required jerk and throwing back of the head; it rarely, if ever, partook of water. It reposed in a nest made of moss and lined with opossum skin, where it appeared to be quite content; while asleep, the head was covered by one of the wings. When called '*bullen-bullen*,' it awoke, looked for several seconds at the disturber, soon put its head under the wing again, and took no notice whatever of other sounds or voices. That the young *Menura* remains for a long time in the nest is proved by the manner in which it disposes of its droppings: our young captive always went backwards before dropping its dung, as if to avoid soiling the nest. It is probable that it leaves the nest in the day time when the warmth of the weather invites it so to do, but that during the night it remains in the nest; and if the weather should become cold the mother shelters her young, the nest being large enough to contain both."

## 5. DESCRIPTION OF A NEW SPECIES OF AMERICAN PARTRIDGE.

BY JOHN GOULD, ESQ., F.R.S., ETC.

### *EUPSYCHORTYX HYPOLEUCUS*, Gould.

Forehead, stripe over each eye, throat and under surface creamy white, head and short crest reddish-brown, minutely freckled with darker brown; round the back of the neck a series of dark brown feathers, tinted with rufous and spotted with creamy-white; general tint of the upper surface grey, mottled and finely freckled with rufous; the centre of the back marked with large blotches of black; wing-feathers freckled with black, and barred on their outer webs with black bounded posteriorly with white; tertiaries bordered with buff, lower part of the flanks and under tail-coverts dark brown spotted with white; tail brown, crossed by narrow, irregular, freckled, grey bars; bill black; feet light brown.

Total length, 7·5 inches; bill, 0·5; wing, 4·1; tail, 2·4; tarsi, 1·2.

*Hab.* Acajutla in Mexico.



*Remark.*—For a knowledge of this species I am indebted to the kindness of M. Jules Verreaux of Paris, who has entrusted it to my charge for the purpose of figuring and describing. M. Verreaux tells me he has seen a second example precisely similar in colour to the one here described, which latter circumstance has mainly induced me to consider it a distinct species. In its colouring it is one of the most remarkable members of the whole family; in size it is about equal to the *Eupsychortyx leucopogon*, but the crest is not so much developed as in that species; its white breast at once distinguishes it from that as well as from every other species.

6. LIST OF ADDITIONAL SPECIES OF BIRDS COLLECTED BY MR. LOUIS FRASER AT PALLATANGA, ECUADOR; WITH NOTES AND DESCRIPTIONS OF NEW SPECIES. BY PHILIP LUTLEY SCLATER, M.A., SECRETARY TO THE SOCIETY.

The present list gives an account of the birds in Mr. Fraser's second collection from Pallatanga, which were not included in my catalogue of his first collection (P. Z. S. 1859, p. 135). Some of them were obtained at Chillanes, which is situate higher up the same valley on the opposite side of the Rio Chimbo; but, judging from Villavicencio's Map, not at a very great distance off. After collecting at Chillanes during part of November 1858, Mr. Fraser returned to Pallatanga, and stayed there until driven out by the rains in the middle of December.

The addition thus made to the Avi-fauna of Pallatanga consists of fifty-nine species, and, together with those enumerated in the list of the former collection, gives a total of 161 species (a large number for a few months' collecting in one spot), illustrated by about 650 specimens.

I have included the names of the birds obtained at Chillanes in the present series, though the character of the ornithology is different, it being evidently situated at a considerably higher elevation. These are—

<i>Turdus gigas.</i>	<i>Elainia</i> ——?
<i>Vireo josephæ.</i>	<i>Pipreola melanolæma.</i>
<i>Tanagra cyanocephala.</i>	<i>Heliotrypha viola.</i>
<i>Chlorospingus superciliaris.</i>	<i>Aglæactis cupreipennis.</i>
<i>Zonotrichia pileata.</i>	<i>Metallura tyrianthina.</i>
<i>Grallaria ruficapilla.</i>	<i>Lesbia gracilis.</i>
<i>Margarornis squamigera.</i>	<i>Adelomyia melanogenys.</i>
<i>Octhoëca fumigata.</i>	<i>Columba albilinea.</i>
—— <i>lessoni.</i>	<i>Ortalia montagnii.</i>
<i>Myiodynastes chrysocephalus.</i>	

Several of these (*Conirostrum fraseri*, *Heliotrypha viola*, *Pipreola melanolæma*, &c.) have not occurred at Pallatanga.

## I. PASSERES.

1. *THRYOTHORUS MYSTACALIS*, sp. nov.

*Supra rufus, pileo fusco, alis caudaque nigricanti-fuscis, brunneo extus limbatis, rectricum pogoniis externis nigro obsolete transvittatis: macula lororum et ciliis ocularibus albis: regione auriculari albo nigroque striolata: gutture albo, mystacibus latis nigris: subtus pallide cinerascenti-albus, ventre crissoque cinnamomeo lavatis: rostro plumbeo; pedibus fuscis.*

Long. tota 6·5, alæ 2·6, caudæ 2·4, tarsi 1·0.

*Hab.* In rep. Equat.

*Mus.* P. L. S.

Two examples (♂), Pallatanga Nov. 1859. "Irides hazel: bill black above, yellowish beneath; legs and feet dark flesh-colour: stomach contained insects."

This Wren is a close ally of *T. coraya* of Guiana and *T. genibarbis* of Brazil, belonging strictly to the same group of species, but distinguishable by its larger size, darker colouring, and well-defined moustache.

2. *CATHARUS MACULATUS*, Sclater, P. Z. S. 1858, p. 64.

Two ex., Pallatanga and Chillanes. Sexes alike. "Irides hazel; bill orange, with black culmen; legs, feet, and rim round the eye orange."

I am surprised at finding this bird here, although it is not quite a solitary instance of the same species occurring on both sides of the Andes. The birds formerly described were from the Rio Napo.

3. *CYPHORINUS GRISEICOLLIS* (Lafr.).—*Merulaxis griseicollis*, Lafr. R. Z. 1840, p. 103.

Gizzard contained insects.

4. *DENDROICA BLACKBURNIÆ* (Gm.).

Two ex., ♂ et ♀.

5. *VIREOSYLVA AGILIS* (Licht.).—*V. virescens*, Baird, Rep. p. 333.

Agrees with Bogota specimens, which I refer to this species.

6. *MYIADESTES VENEZUELENSIS*, Sclater, Ann. & Mag. N. H. ser. 2, vol. xvii. p. 468 (1856).

One pair. "Bill black, with under part of lower mandible yellowish; legs and feet yellowish." Sexes alike.

These birds agree with a Bogota skin in my possession. Cabanis (Mus. Hein. p. 55) notices the occurrence of *M. griseiventris* (Tschudi) from Bogota. It is possible that this is the same as his species; but I should hardly think so from Tschudi's description.

7. *DACNIS EGREGIA*, Sclater, P. Z. S. 1854, p. 251.

"Irides orange; bill black above, blue below; contents of stomach, insects; found very high up in a tall tree."

8. *CONIROSTRUM FRASERI*, Sclater.

Chillanes.

9. *SALTATOR MAGNUS* (Gm.).

A nest of this species, taken from an orange-tree by Mr. Fraser at Pallatanga in November, is cup-shaped, rather loosely put together, built of moss and roots, and lined with coarse roots. The eggs resemble those of the Blackbird (*Turdus merula*), being of a pale greenish, minutely freckled with reddish, more particularly at the larger end: they measure 1.1 by 0.8 inch.

10. *CHLOROSPINGUS SUPERCILIARIS* (Lafr.).

Chillanes, three ex. "Irides hazel."

11. *PYRANGA ÆSTIVA* (L.).

Many examples.

12. *RAMPHOCELUS ICTERONOTUS*, Bp.

Many examples of both sexes and nestlings. Called 'Onza.' Mr. Fraser says of a female, "Certain it is that I have not seen more than two or three specimens in this livery. This bird was extremely shy. I hunted her for several days; she was in company of a male, in adult plumage; he might be constantly seen sitting on the extreme highest point of a young orange tree, a Toronka, or Plantain, giving forth his 'heep, heep,' she answering with the same note, but in a more delicate key, from below and generally at some little distance, but not to be seen; he I suppose giving notice of the approach of danger. This may account in one way for the apparent scarcity of females. In fine weather the male exhibits the whole of the yellow rump; but in the rain the wings are almost, and sometimes entirely, closed over it. On the wing this yellow mark is very conspicuous. The flight is undulating, quick, but laboured. I may have seen as many as a dozen at a time in one tree, but in general not more than three or four. I have frequently seen them take insects on the wing and return to the same spot, like the *Solitarios*."

13. *PIPRIDEA VENEZUELENSIS*, Sclater.

Three ex. "Irides bright red; bill black above, blue below; legs and feet blue; in gizzard vegetable matter," and in another "fruit with small seeds."

14. *EUPHONIA NIGRICOLLIS* (Vieill.).

Two ex. "Irides hazel; bill black above, blue below; legs and feet flesh-coloured; gizzard, green seeds with a pulp."

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15. *CHRYSOMITRIS ICTERICA* (Licht.)?

The same bird as described in P. Z. S. 1858, p. 552, but perhaps not the true *icterica*. "Ilguero: very common."

16. *SPIZA* — ?

One ex. ♂. "Bill nearly black; legs and feet dark blue; food vegetable matter." Apparently a new species of this limited genus of uniform bluish-grey colouring; but the bill is rather crushed, and I am unwilling to describe it from the present specimen.

17. *SYNALLAXIS ERYTHROPS*, sp. nov.

*Murino-brunnea, supra rufescentior, subtus cinerascens, gula albicante: pileo supero et capitis lateribus totis, alis extus et cauda late rufis: subalaribus cinnamomeis: rostro superiore nigro, inferiore carneo, pedibus sordide viridibus.*

Long. tota 5.0, alæ 2.4, caudæ 2.3.

*Hab.* In rep. Equatoriana.

*Mus.* P. L. S.

Five examples, sexes alike. Food "insects." This species may be easily distinguished from its allies by the extension of the red head below the eyes, so as to cover the sides of the face. The rectrices are twelve in number.

18. *MARGARORNIS SQUAMIGERA* (Lafr.).

Chillanes, one ex.

19. *DENDROCOPS ATRIROSTRIS* (Lafr. et D'Orb.); D'Orb. Voy. pl. 54. fig. 1; Lafr. Rev. Zool. 1851, p. 466.

Several ex. "Irides grey; bill blackish."

20. *GRALLARIA RUFICAPILLA*, Lafr.

One ex. "Shumpo: food insects."

21. *GRALLARIA REGULUS*, sp. nov.

*Brunnescenti-olivacea, pileo cinerascens; dorsi plumis nigro circumcinctis; alis nigricantibus extus brunneo limbatis; cauda brevissima unicolore brunnea: subtus saturate ferruginea, gutture et pectore nigricantibus perfusis; torque gutturali pallide cinnamomeo, hujus plumarum apicibus nigris: rostro carneo, supra obscuriore: pedibus corylinis: tectricibus subalaribus ventre concoloribus.*

Long. tota 6.3, alæ 4.0, caudæ 1.2, tarsi 1.6.

*Hab.* In rep. Equatoriana.

*Mus.* P. L. S.

A single specimen of this *Grallaria* is in the collection, without notes. It is strictly of the same group as *G. varia* sive *rex*, *G. imperator* and *G. guatemalensis*, being most closely allied to the latter bird, from which it may be distinguished by its dark throat and breast, clearly defined guttural band, and much inferior size.

## 22. MYRMOTHERULA MENETRIESI (D'Orb.)?

A male and two females, apparently referable to this species of the section embracing *M. axillaris* and its allies. "Irides hazel; gizzard contained insects."

## 23. DYSITHAMNUS MENTALIS (Temm.)?

Many specimens of this bird, apparently hardly different from Brazilian examples.

## 24. PACHYRHAMPHUS — ?

A female of a species belonging to the group containing *P. marginatus*,—perhaps of *P. dorsocinereus*.

25. AMPELION CINCTUS (Tsch.).—*Ampelis cincta*, Tsch. F. P. p. 136.

Four ex. ♂ and ♀, "Irides orange; bill black above, blue below; legs and feet green; gizzard contained the bodies of Land-Mollusks."

The males of this bird do not quite agree with the example from Bogota, now in the British Museum, from which my figure was taken (P. Z. S. 1855, pl. civ.), the head being purely black without yellow markings, and the wings shorter. The latter is the case in the female specimens also. If they are different, it would be difficult to decide which is Tschudi's bird without actual comparison of specimens, particularly as the females are coloured alike.

## 26. PIPREOLA MELANOLEMA, Sclater, Ann. Nat. Hist. ser. 2, vol. xvii. p. 467.

Chillanes, one ex. "*Esparagun*: irides hazel; bill, legs, and feet red; gizzard contained a small green fruit."

This example seems to agree with Venezuelan specimens, and to be different from the Bogota bird (*P. riefferi*), though more of a local race than a species.

## 27. CEPHALOPTERUS PENDULIGER, Sclater, P. Z. S. 1859, p. 142.

Mr. Fraser has now sent a large series of this fine bird, both of males and females. In the females the throat-lappet is quite small, not exceeding  $\frac{1}{4}$  of an inch in length, and the crest-feathers are very little developed. The dimensions are generally smaller. Other names for this bird, besides *Bocinero*, are according to Mr. Fraser's notes, *Trompetero* and *Muchilero*. One example, "when shot, drew the whole of the neck-appendage into one bunch close up to his throat. It was in company with a Cacique (*Ostinops atrovirens*)." Again Mr. Fraser says, "The appendage seems generally held in a bunch like a rose under the throat, and to fall after death."

## 28. OCTHOËCA FUMIGATA (Boiss.).

Chillanes, one ex.

## 29. OCTHOËCA LESSONI, Sclater.

Chillanes, two ex.

## 30. SAYORNIS CINERACEA (Laftr.).

*Patillo*, one ex.

## 31. MYIARCHUS NIGRICEPS, sp. nov.

*Olivaceus, pileo nigro: alis caudaque nigricantibus rufescenti-olivaceo extus limbatis: gutture et pectore cinereis: abdomine toto flavo: rostro et pedibus nigris.*

Long. tota 6·0, alæ 3·1, caudæ 2·7.

*Hab.* In rep. Equator.*Mus.* P. L. S.Several ex. A typical *Myiarchus*, distinguished from other species in my collection by its small size and black head.

## 32. MYIOPHOBUS, sp.

A bad specimen of a species apparently referable to this division.

## 33. LEGATUS ALBICOLLIS (Vieill.).

Seems hardly different from Brazilian examples.

## 34. PLATYRHYNCHUS ALBOGULARIS, sp. nov.

*♂. Brunnescenti-olivaceus; alis et cauda fusco-nigris, brunneo limbatis: pileo cristato interne flavissimo; regione oculari et loris fulvescentibus: subtus flavescenti-fulvus, ventre dilutiore, gutture niveo: rostri nigri tomis pallidis, pedibus pallidis.**♀. Crista pileo concolore.*

Long. tota 3·7, alæ 2·4, caudæ 1·2.

*Hab.* In rep. Equator.*Mus.* P. L. S.

"Irides hazel; found in the underwood."

A near ally of *P. cancroma*, and of the same size, but distinguishable by its pure white throat, black under mandible, longer wings, and more fulvous colouring below.

## 35. ELAINIA — ?

Four ex. Sexes alike.

## 36. ELAINIA — ?

*Pallatanga* and Chillanes.

## 37. ELAINIA STICTOPTERA, Sclater, P. Z. S. 1858, p. 554.

Chillanes, one ex.

## 38. EUPSILOSTOMA PUSILLUM, sp. nov.

*Pallide cinereum, pileo obscuriore, dorso olivaceo perfuso; alis caudaque nigricantibus fulvo extus limbatis; illarum tectrici-*

*bus cervino bifasciatis; subtus albescens, lateribus, tectricibus subalaribus et crisso flavo perfusis: rostro corneo, culmine et apice obscuriore, pedibus nigricanti-plumbeis.*

Long. tota 2·5, alæ 1·9, caudæ 1·5.

*Hab.* In rep. Equator.

*Mus.* P. L. S.

One ex. ♀. "Irides hazel; in gizzard insects."

This diminutive bird may be arranged near *Muscicapa obsoleta* of Temminck from Brazil. I refer them both to a division which I propose to call *Eupsilostoma*, the type being *E. eximium* (*Muscicapa eximia* of Temminck).

### 39. TYRANNULUS FLAVIDIFRONS, sp. nov.

*Olivaceus, fronte et oculorum ambitu flavidis: alis et cauda nigricantibus, illarum tectricibus flavo, remigibus flavicanti-olivaceo, hujus reatricibus olivaceo extus marginatis: subtus pallide cinerascanti-albidus, ventre flavicantiore; tectricibus subalaribus flavidis: rostro et pedibus nigris.*

Long. tota 4·1, alæ 2·3, caudæ 1·9.

*Hab.* In rep. Equator.

*Mus.* P. L. S.

Many examples of this obscure species, and also in the former collection. The bird is nearly allied to that described as *T. chrysops* (P. Z. S. 1858, p. 458) from Zamora, but is of larger dimensions, has a longer tail, stronger beak, and less yellow on the front.

### 40. TYRANNULUS CINEREICEPS, sp. nov.

*Olivaceus, pileo cinereo, loris et oculorum ambitu albidis, macula auriculari nigra, alis caudaque nigris, tectricibus albo terminatis, et secundariis externis albo extus limbatis: subtus flavus, gula olivaceo tincta, mento albicante: rostro et pedibus nigris.*

Long. tota 3·8, alæ 2·2, caudæ 1·5.

*Hab.* In rep. Equator.

*Mus.* P. L. S.

One ex. "Irides hazel, in gizzard vegetable matter."

This species is a near ally of *T. nigricapillus*, but the wings and tail are shorter, the bill is stouter, and the head is cinereous instead of being of a smoky-black.

### 41. LEPTOPOGON SUPERCILIARIS, Tsch. F. P. p. 161. pl. 10. fig. 2.

Two ex. Seemingly agreeing with Tschudi's characters. I have the same bird from the Rio Napo.

### 42. TROGON COLLARIS, Sw.

Mr. Fraser has now forwarded many examples of the *Trogon* sp. 68 of my former list. It proves to be scarcely different from *Trogon collaris* of eastern South America.

## 43. PHAROMACRUS ANTISIANUS (Lafr. et D'Orb.).

Many examples of both sexes. "*Pilco real*: Irides bright red; bill black, base yellowish; gizzards contained wild *Aguacati*. There were three together: they make but little noise."

## 44. NYCTIDROMUS — ?

"*Compadre Gaspar*: gizzard contained moths."

## 45. SCHISTES ALBOGULARIS.

One ex. ♀. "Bill black; feet dark flesh-colour; gizzard contained insects; found in the underwood."

## 46. SCHISTES GEOFFROI.

One ex. ♂. "Bill and feet black; gizzard contained insects. I should take this to be male of 1388 (*Schistes albugularis*), but for the colour of the feet and shape of the tail."

## 47. AGLÆACTIS CUPREIPENNIS.

Chillanes, two ex.

## 48. CYNANTHUS CYANURUS.

Two ex. One, "♂ by diss. Irides hazel; bill black; legs and feet brownish, testes very small. Killed fighting with one of the smaller species."

## 49. LESBIA GRACILIS.

Chillanes.

## 50. PHÆOLEMA ÆQUATORIALIS, Gould.

One ex. Inserted in my former list as *P. rubinoides*. Mr. Gould now considers it different from the New Granadian bird, and proposes to publish it under the new name given above.

## 51. ADELOMYIA MELANOGENYS.

Chillanes.

## II. SCANSORES.

## 52. RHAMPHASTOS TOCARD, Vieill.; Gould, Mon. ed. 2. pl. 4.

Two ex. ♂ et ♀. "♂, irides green; bare space round the eyes green, approaching to yellow near the upper mandible; naked part under the lower mandible greenish-yellow; lower mandible, and lower portion of base of upper, deep maroon, blending into a black stripe, which succeeds it on upper mandible; a broad band of yellow from upper portion of the base of the upper mandible to the point; part of culmen greenish; legs and feet blue: gizzard contained wild *Aguacati*. ♀ similar in all points."

"The males and females have the same note: occurring together



in twos and threes. The bird is called *Predicador* (Preacher) from his note, supposed to represent the words 'Dios,' as he bows his head, and 'tê de' as he moves it from side to side, thus making the sign of the cross."

53. *PTEROGLOSSUS ERYTHROPYGIUS*, Gould, Mon. ed. 2.

"Irides deep straw-colour; bill horn-colour, slightly clouded; blotch at the base vermilion, a narrow basal line and toothed margins of mandibles white; longitudinal line along the lower part of upper mandible and a blotch at the base and apex of the lower mandible black; tip of upper mandible orange; space round and in front of the eyes blue."

These examples differ from the birds figured by Mr. Gould in having no black mark on the culmen of the bill; but there are slight traces observable of this colouring, and in specimens more recently transmitted by Mr. Fraser from Babahoyo it is fully developed.

54. *DRYOCOPUS SCLATERI* (Malh.).—*Megapicus sclateri*, Malh. Mon. Pict. p. 22. pl. 8. fig. 1.—*D. albirostris*, Sclater, P. Z. S. 1859, p. 146.

Two males and one female of this species, described by M. Malherbe from a skin which I transmitted to him for examination. This specimen, which he considered to be a male, turns out to be a female. This male differs in having the front and sides of the head red instead of white, leaving merely a small round patch of white beneath the ear, just as in *D. albirostris*. But it may easily be distinguished from that bird by the *red front*, this part in *D. albirostris* being white.

"*Carpintero*: usually seen in pairs." Gizzard of No. 1620 contained "pulpy fruit with small yellow seeds, and what appeared to be insects' eggs."

55. *CONURUS ERYTHROGENYS*.—*Psittacara erythrogenys*, Less.

"*Loro*: irides yellow; gizzard contained seedy fruit. Very common and very noisy, but difficult to get at."

It may be remarked that Lesson's *Conurus erythrogenys* (published in the 'Traité d'Ornithologie,' p. 215) is not different from *Palæornis malaccensis*. (See Pucheran in Rev. et Mag. de Zool. 1853, p. 160.) Mr. Fraser has now sent several good examples of this species. But one imperfect specimen was contained in his former collection from Pallatanga.

### III. ACCIPITRES.

56. *BUTEO PENNSYLVANICUS* (Wils.).

One ex., ♂ juv. "Irides yellowish-grey; cere yellow; legs and feet yellow."

## 57. ACCIPITER PILEATUS, Max.

A pair. "No. 1404, ♂ : irides orange ; bill black, with yellowish bases ; cere between the nostrils black ; in front and under the nostrils, face, and space round the eyes yellowish ; rim round the eyes orange ; legs and feet orange. No. 1511, ♀ : irides deep orange ; bill blue at the bases, with black tips ; face, legs, and feet yellow ; gizzard contained feathers and the toe of a bird, probably a Guan (*Ortalida*)."

## IV. COLUMBÆ.

## 58. COLUMBA ALBILINEA (Bp.), Consp. ii. p. 51.

Chillanes, one ex. "Gizzard contained minute seeds. A flock of twenty or thirty was noticed."

## 59. GEOTRYGON BOURCIERI, Bp. Consp. ii. p. 71?

Many ex., ♂, ♀, et juv. "*Tortola* or *Chalana* : irides yellow ; bill black ; legs in front and toes above red. Found on the ground." Food "fruit," and in one case "grasshoppers."

## V. GALLINÆ.

## 60. ODONTOPHORUS ERYTHROPS, Gould, P. Z. S. 1859, p. 99.

Four ex. "Irides light hazel ; bill black ; legs and feet blue : gizzard contained shells and grit. Found on the ground, in one instance four in company : *Cubalan*."

A white crescentic mark across the throat is observable in three examples marked *female*, but not in that marked male in the present collection, nor in two male specimens in the former. I therefore suppose it to be peculiar to the female.

## 61. PENELOPE JACUCACA, Spix, Av. Bras. ii. t. 69?

Four ex., sexes alike. "Irides, legs, and feet red ; bill blackish above, dark horn-colour below ; face blue ; throat red ; gizzard contained fruits."

These examples agree with specimens marked *P. jacucaca* in the British Museum.

62. ORTALIDA MONTAGNII, Bp. Compt. Rend. xlii. p. 875.—*O. arcuata*, G. R. Gray, in Mus. Brit.

Chillanes, one ex. "Gizzard contained fruit."

## VI. GRALLÆ.

## 63. TIGRISOMA BRASILIENSE (Gm.).

On ex. ♀ juv. "*Pawaro Tigre* : irides yellow ; legs and feet green ; gizzard contained small crabs."





J. Jennens, lith.

M & N. Hanhart, Im.

OREOMANES FRASERI.

## 64. EURYPYGA HELIAS (Pall.), Bp. Consp. ii. p. 144.

One ex. "Irides red; bill black above, orange below; legs and feet dirty orange, darker in front, brighter behind. Stomach contained small bones, apparently of fishes, grubs, and beetles. This bird was running about the margin of the river like a Sandpiper, and sitting on the large stones in the water."

7. LIST OF BIRDS COLLECTED BY MR. FRASER IN THE VICINITY OF QUITO, AND DURING EXCURSIONS TO PICHINCHA AND CHIMBORAZO; WITH NOTES AND DESCRIPTIONS OF NEW SPECIES. BY PHILIP LUTLEY SCLATER, M.A., SECRETARY TO THE SOCIETY.

(Aves, Pl. CLIX.)

After leaving Pallatanga in the middle of January 1859, Mr. Fraser returned to Riobamba. From Riobamba he made an excursion to Panza, a place situated on the southern slope of Chimborazo, at an altitude of about 14,000 feet above the sea-level, on the route towards Guaranda. The birds obtained during a short sojourn at this spot were of the following seventeen species\* :—

- |  |  |
|--|--|
| 1. <i>Oreomanes fraseri</i> , sp. nov.   | 10. <i>Myiotheretes erythropygius</i> .    |
| 2. <i>Diglossa aterrima</i> .            | 11. <i>Octhoëca fumicolor</i> .            |
| 3. <i>Zonotrichia pileata</i> .          | 12. <i>Muscisaxicola albifrons</i> .       |
| 4. <i>Phrygilus unicolor</i> .           | 13. <i>Oreotrochilus chimborazo</i> .      |
| 5. <i>Synallaxis flammulata</i> .        | 14. <i>Ramphomicron stanleyi</i> .         |
| 6. <i>Cinclodes excelsior</i> , sp. nov. | 15. <i>Nyctidromus</i> , sp.               |
| 7. — <i>albiventris</i> , sp. nov.       | 16. <i>Peristera melanoptera</i> .         |
| 8. <i>Grallaria monticola</i> .          | 17. <i>Attagis chimborazensis</i> , sp. n. |
| 9. <i>Agriornis andicola</i> , sp. nov.  |  |

I am not aware of any birds having been collected at a higher elevation than this series; and it will, I am sure, be interesting to the Society to see the curious forms which compose the feathered inhabitants of these dreary and inhospitable solitudes. They are mostly birds of dull plumage, and belong (with the exception of the *Zonotrichia*) to genera peculiar to the South American or Neotropical Region; the greater part of them being characteristic either of the more southern portion of the continent, or of the elevated regions of the mountain ranges.

Leaving Panza, Mr. Fraser returned to Riobamba, and thence proceeded to Quito, collecting on his way such species (*Cathartes atratus*, *Cyanopterus discors*, and *Fulica chilensis*) as occurred to him.

The months of February and March and part of April 1859 were

\* A letter from Mr. Fraser, giving some account of this excursion, will be found in 'The Ibis,' vol. i. p. 208.

passed at various spots on the western slope of the Andes to the north and north-west of Quito. Of the birds collected there I have given an account in a separate paper. But I have added to the present list the names of the species obtained at Quito itself, and at the following localities, all of high elevation, and in its immediate vicinity: (1) Lloa, a small pueblo situate a few miles to the south-west of Quito on the side of Pichincha in a well-wooded district; (2) Guapulo, at a somewhat lower elevation, one league to the north-east of Quito; (3) *Guagua* (old) Pichincha and *Rucu* (young) Pichincha, the names applied to two of the principal summits of that celebrated volcano, to which Mr. Fraser made excursions.

1. *THRYOTHORUS EUOPHRYS*, sp. nov.

*Supra læte rufus, pileo summo fuscescente; superciliis distinctis et elongatis cum macula suboculari albis: subtus pallide rufescens; gutture et pectore medio albis, mystacibus latis et pectoris plumarum marginibus nigris: rostro et pedibus plumbeis.*

Long. tota 6·5, alæ 2·7, caudæ 2·2, tarsi 1·0.

Lloa, May 1859, one ex. "Irides hazel; bill blue; culmen black; legs and feet blue."

This Wren belongs, like *T. mystacalis*, from Pallatanga, to the group of *T. coraya*. It much resembles the former species, but has a longer, thinner, and more curved bill, a lighter plumage above, and black terminations to the breast-feathers, which are sufficient to distinguish it.

2. *THRYOTHORUS MYSTACALIS*, Sclater, *antea*, p. 64.

Lloa.

3. *CINNICERTHIA UNIBRUNNEA* (Lafr.).

Lloa and Guagua Pichincha.

4. *BASILEUTERUS NIGRICAPILLUS* (Lafr.).—*Trichas nigricristatus*, Lafr. R. Z. 1840, p. 230.

Guapulo.

5. *SETOPHAGA RUFICORONATA*, Kaup.

Lloa.

6. *PETROCHELIDON MURINA*, Cassin, Pr. Ac. Sc. Phil. (1853) vi. p. 370.

Many ex., Quito: "Very common in and about the city." In May this Swallow was building under the eaves of the houses. The nest forwarded is a shallow structure, composed of moss and lined with a little wool. The egg is of a spotless white, 0·72 inch in length by about 0·51 in breadth, and has the usual character of birds of this group.

## 7. PETROCHELIDON CYANOLEUCA (Vieill.).

One ex., Quito, May. "Common in and about the city."

## 8. OREOMANES FRASERI, sp. et gen. nov.

*Oreomanes*, genus novum ex familia CÆREBIDARUM.

*Rostrum tenue, vix longius quam caput, rectum, compressum, mandibularum apicibus rectis et acutis: alæ fere ut in genere Diglossa, sed paulo longiores, ex primariis novem, quarum secunda, tertia, et quarta cœquales, prima brevior quintam æquat: cauda quadrata paulo brevior quam in hoc genere: pedes fortiores, tarsi crassiores et breviores, acrotarsiis vix conspicue divisis.*



Typ. et sp. unica, O. FRASERI. (Pl. CLIX.)

*Supra plumbea; alis caudaque intus fusco-nigris, extus plumbeo stricte limbatis: superciliis brevibus et corpore toto subtus saturate ferrugineo-rufis: facie utrinque, tectricibus subalaribus et tibiis albis: rostro et pedibus nigris.*

Long. tota 6·3, alæ 3·5, caudæ 2·4, rostri a rictu 0·8, tarsi 0·9.

*Hab.* In Monte Chimborazo, ad alt. 14,000 pedum.

*Mus.* P. L. S.

The general appearance of this curious form is so much that of a *Diglossa* that I am induced to believe its natural place is near those birds, although the structure of the bill is rather different. Indeed, after ascertaining that the wing has only *nine* primaries, I know not

where else it could be placed at all satisfactorily. The bill is straight and sharp, and the ends of the mandibles pointed through rather rounded laterally at the termination. In spite of this, and its rather shorter and stronger tarsi, I believe it is more nearly allied to *Diglossa* and *Diglossopsis* than to any other genus of *Cerebida*.

Mr. Fraser has sent one skin of this species and one bird in spirits, both obtained at Panza, on the side of Chimborazo. His notes are as follows:—" *Gorion del Paramo*, male by dissection. Irides hazel; bill, legs, and feet black; in gizzard insects and caterpillars. These birds hop about on the ground and scratch in the sand like the *Gorions* (*Zonotrichia pileata*); in the trees they are very sprightly, and resemble the *Trepadores* (*Glyphorhynchus* and its allies). Their note is 'chip-chip,' about four times in succession. In fact they may be considered the Tits (*Parus*) of this country."

9. *DIGLOSSA PERSONATA* (Fraser).

Lloa.

10. *DIGLOSSA ATERRIMA*, Lafr.

Panza. "Found on the tops of the stunted trees; exceedingly fat, —called *Congo*."

11. *PSITTOSPIZA RIEFFERI* (Boiss.).

Lloa, June 1859. "Irides hazel; bill, legs, and feet blood-red; in gizzard a dark purple fruit."

12. *BUARREMON ASSIMILIS* (Boiss.).

Lloa.

13. *BUARREMON LATINUCHUS*, DuBus.

Guapulo.

14. *CHLOROSPINGUS ATRIPILEUS* (Lafr.).

Lloa, June. One ex. ♀. "Irides hazel; contents of stomach vegetable matter."

15. *PÆCILOTHRAUPIS LUNULATA* (DuBus).

Lloa. Sexes alike. "In gizzard green vegetable matter."

16. *ZONOTRICHIA PILEATA* (Bodd.).

Panza, Chimborazo.

17. *PHRYGILUS UNICOLOR* (Lafr. et D'Orb.).

Panza and Guagua Pichincha, several ex. ♂ et ♀. "*Pajaro del Parimo*. Irides hazel; bill nearly black; legs light brown; feet dark brown; common amongst the *Paja*, and runs much upon the ground."

18. *SYNALLAXIS FLAMMULATA*, Jard. Contr. Orn. 1850, p. 82. pl. 56.



Panza. "Irides hazel; bill, legs, and feet black. Shot in a tree under which our fire was burning."

19. *CINCLODES EXCELSIOR*, sp. nov.

♂. *Fumoso-brunneus, uropygio rufescentiore: linea superciliari et ciliis oculorum albis: alis cinnamomeo-rufis, fascia duplici et altera terminali nigricantibus, tectricibus minoribus dorso concoloribus: cauda nigricante, rectricibus duabus mediis et lateralium apicibus cinnamomeo-brunneis: subtus pallide fuscescens, medialiter dilutior, gula albicantiore, colore obscuriore nubilatus: tectricibus subalaribus et remigum (nisi duarum externarum) marginibus interne pallide cinnamomeis: rostro nigro, pedibus obscure brunneis.*

Long. tota 8·5, alæ 4·8, caudæ 3·3, rostri a rictu 1·2, tarsi 1·4.

♀. *Mari similis, sed crassitie paulo inferiore.*

*Hab.* In Monte Chimborazo, reipubl. Equator. ad alt. 14'000 ped.

*Mus.* P. L. S.

Panza and Guagua Pichincha, six ex. of both sexes. *Tungi*: irides hazel; gizzards contained "insects, caterpillars, and grubs. Found on every part of the Paramo: a very active bird; tame on our first arrival."

This apparently new species of *Cinclodes* is the largest of the genus that I am at present acquainted with, rather exceeding in dimensions *Upucerthia dumetoria*, an aberrant member of the same group. In its thick but curved beak it is somewhat intermediate between the two forms. *U. andicola* of D'Orbigny's 'Voyage' appears to be much smaller, the wings only measuring 90 mm. (about 3·0 inches), instead of 4·8.

20. *CINCLODES ALBIDIVENTRIS*, sp. nov.

*Supra fumoso-brunneus, uropygium versus rufescentior, linea superciliari et ciliis oculorum albidis: alis nisi in duabus primariis externis, cinnamomeo-rufis, fascia duplici et altera terminali nigricantibus, tectricibus minoribus dorso concoloribus: cauda dorso concolore, sed rectricum externarum apicibus extus cinnamomeis: subtus lactescenti-albus, gutture clariore, pectore fusco variegato: lateribus et crisso fulvescentibus: rostro et pedibus nigris.*

Long. tota 7·0, alæ 3·8, caudæ 2·5, rostri a rictu 0·9, tarsi 1·2.

*Hab.* In Monte Chimborazo reipubl. Equator. ad alt. 14'000 pedum.

*Mus.* P. L. S.

Panza, *Tungi Chico*, four ex., all ♀. "Irides hazel; gizzards contained insects and caterpillars."

This *Cinclodes* is of the same size as *C. vulgaris*, *C. patachonicus*, and *C. antarcticus*, and belongs to the same group. It may be distinguished by the paler colouring below, being almost white on the belly, and the deeper, almost chestnut-red colour, of the base of the intermediate primaries.

## 21. GRALLARIA MONTICOLA, Lafr.

Panza, Guagua Pichincha (1200 feet), and Rucu Pichincha, four ex. "*Shumpo*: very common at Panza; in gizzard caterpillars; irides hazel; bill black; legs and feet brownish. Only seen running on the ground."

## 22. AMPELION RUBROCRISTATUS (Lafr. et D'Orb.).

Lloa, one ex.

## 23. AGRIORNIS ANDICOLA, sp. nov.

*Cinerascenti-fuscus, subtus pallide ochraceus, pectore cinerascete, gutture albo nigro striato, ventre imo crissoque et tectricibus subalaribus pallide cervinis: cauda alba, rectricibus duabus intermediis, sequentium pogonio interno et ceterarum macula terminali, gradatim decrescente, cinerascenti-nigris: rostri nigricantis basi carneo, pedibus nigris.*

Long. tota 11·0, alæ 6·0, caudæ 5·0.

*Hab.* In mont. reipubl. Equator.

*Mus.* P. L. S. 1

Panza, one ex. "*Solitario ravo-blanco*: irides hazel; in gizzard a large white grub: common."

This is the finest and largest species of *Agriornis* I have yet seen. It exceeds in size *A. livida* of the Chilian sea-coast, and possesses the striated throat of this species with the white tail of *A. solitaria*.

## 24. AGRIORNIS SOLITARIA, Selater, P. Z. S. 1858, p. 553.

Quito, May. *Solitario ravo-blanco*. Two nests are forwarded by Mr. Fraser belonging to this bird. One was taken "from a mud wall," the other from "under a bridge passing over the Machangra." They are cup-shaped, composed rather roughly of roots and tendrils, and lined with wool. The eggs are rather rounded in shape, white sparingly dotted, principally at the larger end, with red and pale purple. They measure 1·15 in long and ·85 in short diameter. Mr. Fraser says that this bird frequents the tops of the houses in Quito, and is said to breed in the church-towers.

25. MYIOTHERETES ERYTHROPYGIUS.—*Tænioptera erythropygia*, Selater, P. Z. S. 1851, p. 193.

Panza, two ex. "*Solitario colorado*: irides hazel; bill, legs, and feet black; food insects." The bill of this species is much more feeble than in *M. rufiventris* and *M. striaticollis*, and the primaries are not emarginate at the tips.

26. MUSCISAXICOLA ALBIFRONS (Tsch.).—*Ptyonura albifrons*, Tsch. Faun. Per. p. 167. pl. 12. fig. 2.—*Tænioptera alpina*, Jard. Contr. Orn. 1849, p. 47. pl. 21.

Panza, several ex. "*Solitario blanco*: very common throughout the *Paramo*; irides hazel; bill, legs, and feet black."

27. *OCTHOËCA FUMICOLOR*, Sclater, P. Z. S. 1856, p. 28.

Panza, one ex.

28. *ELAINIA STICTOPTERA*, Sclater, P. Z. S. 1858, p. 554.

Lloa, one ex.

29. *NYCTIDROMUS* — ?

Panza. A young bird captured on the ground by the hand. "Irides hazel."

30. *NYCTIBIUS PECTORALIS*, Gould.

Western slope of the Andes.

31. *OREOTROCHILUS CHIMBORAZO*.

Panza, many ex. "Irides hazel; bill, legs, and feet black. To be seen occasionally on the *Arbor maria*, but feeds generally on a red thistle. It is common, and by no means shy, and has rather a pretty song for a *Quindi*, oft repeated, and to be heard at a considerable distance. In bad weather, when the wind is high, this bird is said to creep under and into the clumps of *Paja* (a species of *Stipa*)."

32. *OREOTROCHILUS PICHINCHA*.

Guagua and Rucio Pichincha (14,000 feet alt.), many ex. "The Pichincha Humming-bird, like the Chimborazo, is found only close under the line of perpetual snow; but this species, according to the present state of our knowledge, is more widely distributed than the latter, being found not only on Pichincha, but also on Antisana and Cotopaxi. Upon my first visit to Guagua Pichincha these birds were feeding entirely on the ground, hunting the little moss-covered clumps as fast as the snow melted. They are not uncommon in this locality, but always met with singly. They are very restless, but not shy, seldom remaining on one clump more than a second, then away to another, perhaps a yard distant. Sometimes they would take a rapid flight of 40 or 50 yards. On my second visit, the Chuquiragua (*Chuquiraga insignis*, Humb.) being in flower, they were feeding from it like the *Quindi* of Chimborazo, but still occasionally hunted the mossy clumps. They fit with a *burr* of the wings, and occasionally settle, with the feathers all ruffled, on the top of the Chuquiragua or other small plant. In this respect, so far as my observations and those of Professor Jameson go, they differ from *O. chimborazo*. Professor Jameson found this species building hanging nests, in the lower compartment of the farm-house on Antisana."

Mr. Fraser has sent home one of these nests as found by Professor Jameson on the 2nd November, 1858. It was attached to a straw

rope hanging to the roof of the house\*, which is situated at an elevation of 13,454 feet above the sea-level. It forms a large compact mass of wool and hair mixed with dried moss and feathers of the curious shape portrayed in the accompanying woodcut. A little



cup-shaped opening at the top forms a receptacle for the eggs, and is balanced and brought into a horizontal position by the weight of the mass on the opposite side of the rope by which it is suspended.

Mr. Fraser again says, speaking of two specimens obtained on Guagua Pichincha in June, "From the mouth of one of these two birds a quantity of very pale yellow fluid of a slightly sweet taste flowed; but I did not find any in either crop or gizzard. Amongst some of those, of the same species, which I skinned the other day, I observed the same thing. If my memory serves me correctly, it has occurred *twice* before in other species.

"I observed three specimens of this bird all of a row, hanging to the bare rock, (this now explains the use of those large feet and claws, which the species of this group have, and which has hitherto puzzled me,) like Sandmartins; it was under a ledge, well protected from the weather, consequently well adapted by nature for nest-building. They would fly away and then return; this was done in my sight three or four times in succession. On examining the spot, which was almost inaccessible, I found much excrement, proving to my mind that they bred in societies. My countryman, Col. Stacey, on a visit to this mountain, happened to have on a new bright yellow oil-skin cover to his wide-awake hat, and one of these birds flew round and round it for a considerable time, as he supposes, mistaking it for a flower.

"No snow on the ground this visit (June 5), and all birds were

\* See 'Ibis,' 1859, p. 115.

apparently scarce and shy; these birds in particular were chasing each other, in twos and threes, like flashes of lightning.

"Had I had a tent, I would have located myself, for some time, amongst these little high-minded creatures, and completed the observations now commenced."

33. *ERIOCNEMIS LUCIANI*.

Lloa, May.

34. *LESBIA AMARYLLIS*, Gould.

"Common in and about the houses in Quito, seeking food among the flowers grown in pots."

35. *BOURCIERIA FULGIDIGULA*, Gould.

"*Quindi ravo-blanco* : Lloa, May."

36. *RHAMPHOMICRON STANLEII*.

Panza, three ex. "Very swift of flight; stomachs contained insects."

37. *PETASOPHORA IOLATA*, Gould.

Lloa.

38. *AGLÆACTIS CUPREIPENNIS*.

Lloa and Ruco Pichincha.

39. *HELIANTHEA LUTETIÆ*.

Lloa.

40. *DOCIMASTES ENSIFER* (Boiss.).

Lloa.

41. *PATAGONA GIGAS* (Boiss.).

"Shot about two miles from Quito, May 1859. Common wherever the Aloe (*Agave americana*) is in flower."

42. *LAFRESNAYA GAYI*.

Lloa.

43. *COLAPTES ELEGANS*, Fraser.

Lloa. Gizzard contained "insects."

44. *MILVAGO CARUNCULATUS* (Des Murs).—*Phalcobænus carunculatus*, Des Murs, Rev. Zool. 1853, p. 154.

One ex., *Curricunga*, ♀ by diss. "Shot sitting on a clump at the upper edge of the Paramo, on the road to Guagua Pichincha, at an altitude of about 14,000 feet. She seemed not easily disturbed. These birds soar together in pairs. They appear to be breeding in

the crevices of the naked and abrupt peaks of Guagua Pichincha. On opening the body for examination, it sent forth an almost unbearable stench. Bill blue; naked face; throat, legs, and feet orange; claws bluish."

This specimen agrees with those described from Mr. Fraser's second collection (P. Z. S. 1858, p. 555), which I there erroneously referred to the *Milvago megalopterus* of Bolivia.

45. *STRIX PUNCTATISSIMA*, G. R. Gray, Zool. Voy. 'Beagle,' p. 34. pl. 4.

Quito, May 1859, ♀. "Said to build in the church-towers in the city." Hitherto only known from the Galapagos.

46. *PERISTERA MELANOPTERA* (Mol.).

Panza, one ex. "Gizzard contained seeds; bill black; bare space under and in front of the eyes salmon-colour. Appears to be very common on the edge of the Paramo."

47. *ATTAGIS CHINBORAZENSIS*, sp. nov.

*Supra niger, plumis omnibus lineis ochraceo-rufis marginatis et intus notatis: remigibus alarum nigricanti-cinereis, margine angusto apicali albido: subtus gutture ad medium pectus ochraceo-rufo, subcaudalibus nigro variegatis: rectricibus obscure cinereis, harum pogoniis externis lineis pallide cinnamomeis frequenter transfasciatis: tectricibus subalaribus pallide cinnamomescenti-albidis: rostro et pedibus (in pelle) obscure fuscis.*

Long. tota 11·0, alæ 7·3, caudæ 3·0, tarsi 1·0.

*Hab.* In Monte Chimborazo, ad alt. 14,000 pedum.

Panza, three ex., sexes alike. "Cordoniz: found among the bare rocks; note 'chay-lac, chay-lac, chay-lac'; gizzard contained green vegetable matter and grit."

This *Attagis* is nearly of the same size and general proportion as *A. latreillei* of Chili, figured in Gray's 'Genera of Birds,' pl. 125; but is readily distinguishable by its much darker, blacker colouring above, and unspotted cinnamon-brown breast.

48. *VANELLUS RESPLENDENS*, Tsch.

"*Veranero*; very common on all the marshy plains of the tableland from May to September."

49. *GALLINAGO* — ?

Panza, one ex. *Sumbardor*. A fine large Snipe with fourteen tail-feathers, probably of a new species, but requiring close investigation.

50. *FULICA CHILENSIS*, Des Murs.

One ex., ♀. "Shot on the settled waters of the Paramo, between Riobamba and Mocha: irides red; frontal shield delicately







orange, blending into lemon at the sides and back ; bill flesh-colour, point bluish ; legs and feet delicate slate-colour."

51. *CYANOPTERUS DISCORS*.

One ex., ♂, in eclipse plumage, from the Rio Machangra, below Quito, May 1859.

52. *DAFILA* — ?

One ex., ♂, in eclipse plumage, from the same locality as *Fulica chilensis*.

8. LIST OF BIRDS COLLECTED BY MR. FRASER IN ECUADOR, AT NANEGAL, CALACALI, PERUCHO, AND PUELLARO ; WITH NOTES AND DESCRIPTIONS OF NEW SPECIES. BY PHILIP LUTLEY SCLATER, M.A., SECRETARY TO THE SOCIETY.

(Aves, Pl. CLX.)

The localities at which this part of Mr. Fraser's collections was formed are all situated northwards of Quito at different heights on the western slope of the Andes in the valleys traversed by branches of the Rio Perucho, which joins the Esmeraldas and enters the Pacific. Nanegal was visited in February 1859. Its altitude above the sea is about 4000 feet. It lies on the western slope of Pichincha, 10 leagues from Quito. Many of the birds of Nanegal were also found at Pallatanga ; but there are many interesting novelties amongst them, such as *Basileuterus semicervinus*, *Pipreola jucunda*, *Pipra deliciosa*, and others, which have not been obtained elsewhere. I have added to the list the names of a few species which formed part of a small series contained in Mr. Fraser's former collections from this same locality.

In March Mr. Fraser ascended to *Calacali*, situated due north of Quito, at a height of 8000 feet above the sea-level. *Turdus gigas* was very common here ; *Agriornis andicola*, *Pacilothraupis lunulata*, *Diglossæ aterrima* and *personata*, *Phrygilus alaudinus*, *Muscisaxicola maculirostris*, *Ampelion rubricristatus*, and *Lesbia gracilis* may be considered characteristic of this elevation.

Perucho and Puellaro, Mr. Fraser's next two stations, lie on the further side of the river at elevations of about 6300 and 6500 feet respectively. In April he quitted the latter of these places for a station on the wooded heights above at an elevation of 8000 feet. Of the species met with here, *Ampelion rubrocrisatus*, *Octhoëca lessoni*, *Meltalura tyrianthina*, and *Ortalida montagnii* appear to have been common.

In the localities above mentioned 130 species were obtained altogether, of which I now give the names.

I. PASSERES.

1. *TURDUS ATROSERICEUS*, Lafr.

Above Puellaro. "*Costillar* : much sought after for its song, and

kept in confinement; bill and rim round the eyes yellow; irides hazel; in stomach, green berries of a species of *Melastoma*."

2. *TURDUS GIGAS*, Fraser.

Nanegal, very common.

3. *TURDUS SWAINSONI*, Cab.

Nanegal.

4. *TROGLODYTES SOLSTITIALIS*, Sclater.

Nanegal.

5. *THRYOTHORUS NIGRICAPILLUS*, sp. nov.

*Supra castaneus, alis caudaque nigro late transfasciatis: pileo et capitis lateribus nigris, loris, ciliis oculorum et plumis auricularibus albo terminatis: subtus albus, abdomine rufescente, nigro confertim transvittatus; gutture pure albo: rostro nigricante, mandibula inferiore plumbecente: pedibus pallide plumbeis.*

Long. tota 5·3, alæ 2·5, caudæ 1·8, tarsi ·95.

*Hab.* In rep. Equator.

*Mus.* P. L. S.

Nanegal, three ex. "Irides red; bill black above, blue below; legs and feet lead-colour; gizzard contained insects."

This is a typical *Thryothorus*, resembling in form and size *T. ruf-albus*, *T. albipectus*, &c., but quite distinct in coloration from any species with which I am acquainted.

6. *PARULA BRASILIANA* (Licht.).

Nanegal.

7. *DENDROICA BLACKBURNIÆ* (Gm.).

Nanegal.

8. *SETOPHAGA RUTICILLA* (Linn.), ♀.

Perucho.

9. *SETOPHAGA VERTICALIS* (Lafr. & D'Orb.).

Perucho and Puellaro.

10. *BASILEUTERUS SEMICERVINUS*, sp. nov.

*Obscure fuscus, superciliis a fronte, oculorum ambitu, corpore toto subtus et caudæ parte basali cum hujus tectricibus superioribus pallide cervino-rufis: caudæ parte apicali nigricanti-fusca: tectricibus subalaribus fusciscenti-cervinis: rostro nigro: pedibus pallide corylinis.*

Long. tota 5·0, alæ 2·35, caudæ 1·4.

*Hab.* In rep. Equatoriali.

*Mus.* P. L. S.

Examples of both sexes of this apparently new *Basileuterus* were collected by Mr. Fraser at Nanegal. They are coloured alike. "Irides hazel; bill black; legs and feet brownish flesh-colour; contents of stomach insects."

This species does not differ in form from ordinary *Basileuteri*, except in its rather shorter tail, but is rather abnormal in colouring.

11. *BASILEUTERUS BIVITTATUS* (Lafr. & D'Orb.).

Cachi-Llacta and Nanegal.

12. *VIREO JOSEPHÆ*, Sclater.

Nanegal.

13. *PETROCHELIDON CYANOLEUCA* (Vieill.).

Several ex., Nanegal and Perucho. "Common, and building in the roofs."

14. *DACNIS EGREGIA*, Sclater, P. Z. S. 1854, p. 251.

Two ex. ♂. "Irides orange; stomach contained small red fruit, no insects." Nanegal.

15. *CERTHIOLA LUTEOLA*, Cab.

Two ex., Nanegal. "Gizzard contained minute-seeded fruit."

16. *DIGLOSSA PERSONATA*, Fraser.

Calacali.

17. *DIGLOSSA INDIGOTICA*, Sclater, Ann. & Mag. N. H. ser. 2. xvii. p. 467.

Nanegal, one ex. ♂. "Irides bright red; bill, legs, and feet black."

18. *DIGLOSSA ALBILATERALIS*, Lafr.

Examples of both sexes from Puellaro and from above Puellaro.

19. *DIGLOSSA ATERRIMA*, Lafr.

Calacali.

20. *SALTATOR ATRIPENNIS*, Sclater.

Nanegal.

21. *ARREMON ERYTHRORHYNCHUS*, Sclater, P. Z. S. 1855, p. 83. pl. 89.

Nanegal, four ex. "Irides hazel; bill red; legs and feet flesh-coloured;" in gizzards, "grit," "remains of insects," "seeds."

22. *BUARREMON LATINUCHUS*, DuBus; Sclater, P. Z. S. 1858, p. 293.

Calacali and above Puellaro, six ex. "*Monga*: in gizzard a quantity of vegetable matter, remains of insects and their eggs."

23. BUARREMON CASTANEICEPS, Sclater, P. Z. S. 1859, p. 441.

Nanegal, one ex. "Bill brownish above, blue below; legs and feet brown; in gizzard insects and vegetable matter." Described from a single specimen received by M. Verreaux from the Rio Napo.

24. CHLOROSPINGUS FLAVIGULARIS, Sclater, Contr. Orn. 1852, p. 131, pl. 98.

Nanegal, two ex. ♂ and ♀, sexes alike. "Irides yellowish; bill black above, blue below; legs yellowish; feet blue." Besides the example from Bogota, originally described, I have hitherto seen but one specimen of this species, which was obtained by Mr. Moore in his journey down the Napo, and is now in the collection of Mr. Lawrence of New York.

25. CHLOROSPINGUS ATRIPLEUS (Lafr.).

Above Puellaro.

26. CHLOROSPINGUS SUPERCILIARIS (Lafr.).

Nanegal, one ex.

27. RAMPHOCELUS ICTERONOTUS, Bp.

Nanegal, several examples of both sexes—*Platanero*.

28. TANAGRA DARWINI, Bp.

Calacali.

29. COMPSOCOMA SUMPTUOSA (Less.).

Wooded heights above Puellaro. "*Chucunillo*:" in stomach "berries" and "vegetable matter."

30. PÆCILOTHRAUPIS LUNULATA, DuBus.

Calacali and above Puellaro, many examples. "*Platero*: in gizzard dark green fruit."

31. CALLISTE RUFIGULARIS (Bp.).

Nanegal, three ex. "Food minute-seeded fruit."

32. CALLISTE AURULENTA (Lafr.).

Nanegal.

33. CALLISTE VITRIOLINA (Cab.).

Perucho and Puellaro, many examples. "*Frutero*: feeding in a large *Tocte*-tree (*Juglans* sp.), from which they were constantly flying to and fro. These must be the Gallinazos (*Cathartes*) amongst the Tanagers, for their heads and necks are very sparingly feathered,

and were, when I shot them, entirely covered with the pulp of the fruit ; so much so, that I only partly succeeded in cleansing them."

34. *CALLISTE AURULENTA* (Laftr.).

Nanegal, four ex.

35. *CALLISTE LUNIGERA*, Selater.

Nanegal, one ex. "Bill black ; legs and feet blue ; food vegetable matter and insects."

36. *CALLISTE GYROLOIDES*.

Nanegal. Food "fruit and insects."

37. *CALLISTE ICTEROCEPHALA* (Bp.).

Nanegal. "Irides hazel ; bill black ; legs and feet blue ; food green minute-seeded fruit."

38. *DIVA VASSORI*, Selater.

Above Puellaro, April. "One ex. ♀, with two eggs nearly perfect in the ovary ; food vegetable matter."

39. *CHLOROCHRYSA PHÆNICOTIS*, Bp.

Nanegal, one ex. ♂. "Irides hazel ; bill black ; legs greenish ; feet nearly black ; in gizzard a spider and fruit."

40. *EUPHONIA NIGRICOLLIS* (Vieill.).

Perucho and Puellaro. "Found in pairs on the tall flowering stems of the Aloe (*Agave americana*) uttering a plaintive *wee-wee* in the heat of the day."

41. *EUPHONIA XANTHOGASTRA* (Sund.).

Nanegal, many ex.

42. *PHEUCTICUS CHRYSOGASTER* (Less.).

Calacali. Mr. Fraser evidently considers this bird as not different from *P. aureiventris*, for he says, "Common also about Quito, where it breeds in May." Now the examples from Riobamba, above Punin, &c. are referable to the black-headed *P. aureiventris*.

43. *PHRYGILUS ALAUDINUS* (Kittlitz).

Calacali. "Not uncommon ; food small seeds and grubs ; lives entirely on the ground amongst the heather : when disturbed, takes an undulating flight for about 60 or 80 yards."

44. *PHRYGILUS OCULARIS*, Selater.

Calacali. "Food seeds : might be easily mistaken for the preceding (*P. alaudinus*) at a distance, only it perches sometimes."

45. *CORYPHOSPINGUS*, sp.?  
Nanegal. Apparently a female of some species of this genus.
46. *CATAMENIA HOMOCHROA*, Sclater, P. Z. S. 1858, p. 552.  
Calacali and above Puellaro. Apparently the females of this species; but one marked ♂ may be a young male. "Irides hazel; food vegetable matter and seeds."
47. *SPERMOPHILA GUTTURALIS* (Licht.).  
Nanegal and Puellaro. Rather brighter in the belly than an eastern specimen, apparently from Trinidad.
48. *ORYZOBORUS ÆTHIOPS*, sp. nov.  
*Ater unicolor: tectricibus subalaribus, speculo alari parvo et tiliarum parte interna albis: rostro et pedibus plumbeis.*  
Long. tota 4·7, alæ 2·2, caudæ 2·1, tarsi 0·575.  
Nanegal, one ex. ♂. "Irides hazel; food seeds."  
I have a second specimen of this bird, which is very nearly allied to my *O. funereus* (P. Z. S. 1859, p. 378) from Minca in New Granada, received through M. Verreaux. It has a smaller bill than the Mexican bird, and the tarsi are much shorter, and feet smaller. I am disposed to consider them as referable to two different species.
49. *OSTINOPS ATROVIRENS* (Lafr. et D'Orb.).  
Nanegal.
50. *CYANOCITTA TURCOSA*, Bp.  
Above Puellaro and in the valley of Chillo.
51. *PICOLAPTES LACRYMIGER* (Lafr.).  
Nanegal, one ex.
52. *DENDROCOPS ATRIROSTRIS* (Lafr. et D'Orb.).  
Nanegal.
53. *PSEUDOCOLAPTES BOISSONEAUTI* (Lafr.).  
Above Puellaro, one ex. "*Galeador*: food insects."
54. *MARGARORNIS SQUAMIGERA* (Lafr.).  
Above Puellaro.
55. *MARGARORNIS BRUNNESCENS*, Sclater, P. Z. S. 1856, p. 27.  
pl. 116.  
Nanegal, one ex. ♀. "Irides hazel; food insects."
56. *SYNALLAXIS PUDICA*, Sclater, P. Z. S. 1859, p. 191.  
Nanegal. "Irides hazel."

57. *SYNALLAXIS GULARIS*, Lafr.

Nanegal, one ex.

58. *GRALLARIA SQUAMIGERA* (Prevost).

Calacali and above Puellaro.

59. *THAMNOPHILUS IMMACULATUS*, Lafr.

Nanegal. "Irides red; bill black; legs and feet very dark blue; face cærulean blue; food insects."

60. *DYSITHAMNUS OLIVACEUS*?

Nanegal.

61. *DYSITHAMNUS UNICOLOR*, Selater, P. Z. S. 1859, p. 141.

Nanegal, ♂ et ♀. Male, "irides greyish;" female, irides "reddish hazel." Food "caterpillars, beetles, insects."

62. *MYRMOTHERULA MENETRIESI* (D'Orb.).

Nanegal. Agrees with examples of the bird of this genus mentioned in the preceding list, p. 67.

63. *PIPREOLA JUCUNDA*, sp. nov. (Pl. CLX.)

*Psittaceo-viridis; capite toto et gula nigris: pectore aurantiaco, nigro anguste circumcincto, ventre medio, hypochondriis et crisso flavis; rostro ruberrimo, pedibus cinereis.*

Long. tota 6·5, alæ 3·8, caudæ 2·4.

*Hab.* In rep. Equator.

*Mus.* P. L. S.

Cachi-Llacta, one ex. ♂. *Esparagun*. This beautiful new species of *Pipreola* is closely allied to Hartlaub's *P. formosa* (Rev. et Mag. de Zool. 1849, pl. 14. p. 275); but is distinguishable by the want of white markings on the wings, the black edging to the large orange breast-plate, and the sides of the body being green. It forms a brilliant addition to this lovely group of birds.

64. *AMPELION CINCTUS* (Tsch.).

Nanegal, one ex., agreeing with specimens from Pallatanga. "In stomach vegetable matter."

65. *AMPELION ARCUATUS* (Lafr.).

Above Puellaro, one ex. ♂. "*Sangralluvia*: irides greyish; legs, feet, and bill deep red; gizzard contained dark purplish fruit."

66. *AMPELION RUBROCRISTATUS* (Lafr. et D'Orb.).

Calacali and above Puellaro, several ex.

67. *CHIROMACHERIS MANACUS* (Linn.).

Nanegal, examples of both sexes. "Irides hazel; bill black; legs and feet orange."

Agrees with examples from Cayenne and New Granada.

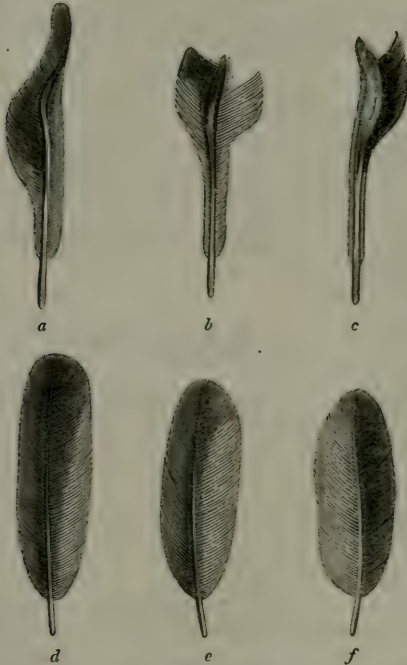
68. *PIPRA DELICIOSA*, sp. nov.

♂. *Fulvescenti-castanea, pileo antico coccineo: alis caudaque nigris, uropygio nigricante: hypochondriis et tectricibus subalaribus albis, margine axillari flavicante: rostro nigro, pedibus albidis.*

♀. *Obscure olivacea, subtus dilutior; ventre, crisso et tectricibus subalaribus flavicantibus.*

Long. tota 3·5, alæ 2·5, caudæ 0·8.

Nanegal, three ex. "♂. Irides red; bill black; legs and feet yellow; testes very large; gizzard contained minute-seeded fruit," in another "green berries." "♀. Irides hazel; bill black; legs and feet bluish flesh-colour; gizzard contained dark indigo-coloured fruit."



This Manakin is one of the most brilliantly coloured birds of the charming group to which it belongs; and the male bird is further remarkable for the very curious structure of its wings, which merits a detailed description. The ten primaries are of the ordinary formation of birds of this family, the first being shorter than the second, third, and fourth, which are nearly equal and longest, and of about



the same length as the sixth. The first three secondaries are thick-stemmed and curved towards the body at a distance of about two-thirds of their length from the base. The fourth and fifth show this structure to a greater degree, with some corresponding alteration in the barbs on each side, as may be seen by comparing fig. *a*, representing the upper surface of the fifth secondary of the male bird, with fig. *d*, which gives a similar view of that of the female. In the sixth and seventh secondaries of the male the terminal half of the *rachis* is thickened to an extraordinary degree, forming a solid horny lump. The external and internal barbs are also much modified in shape and generally curtailed in size. Fig. *b* gives an upper view of the sixth, and fig. *c* an under view of the seventh secondary. The corresponding feathers of the female, representing the normal structure, are seen in fig. *e* and fig. *f*. In the eighth and ninth secondaries the *rachis* is still rather thickened; but the barbs (*pogonia*), instead of being reduced in size, are highly developed, particularly on the inner side. Mr. Fraser states that the wing-bones of these birds were also much thickened, no doubt in aid of this abnormal structure of the *remiges*.

The same deviation from ordinary characters is observable in other species of the allied group *Chiromachæris* (*e. g.* in *C. manacus*, *C. gutturosa*, *C. candæi*, &c.). I believe it is this structure which enables them to make the extraordinary noise for which they are noted. Buffon says that the *Chiromachæris manacus* is called *La caisse-noisette* in Cayenne; and Mr. Salvin tells us (*Ibis*, 1860, p. 37) that *C. candæi* "begins with a sharp note, not unlike the crack of a whip." But in no other species is the abnormal development carried to so great a degree as in the present.

#### 69. *MASIUS CORONULATUS*, sp. nov.

*Nigerrimus, plumarum menti parte basali cum plaga magna gutturali, alis infra, et remigum rectricumque mediarum parte interna vivide luteis: capitis crista, erecta, elongata, pallide flava, hujus plumarum apicibus dilatatis et incrassatis, colore aurescenti-castaneo: rostro plumbeo, pedibus rubris.*

Long. tota 3·7, alæ 2·3, caudæ 1·7, tarsi 0·65.

*Hab.* In rep. Equator.

*Mus.* P. L. S.

Nanegal, one ex. This Manakin is a close ally of *Masius chrysopterus* of New Granada; but may be readily distinguished by its crest, which is of a paler yellow and terminated with pale golden red, the feathers being thickened and flattened at the extremity into a horny substance, something like that on the wings of the Wax-wing Chatterer. One example occurred in Mr. Fraser's former collection from Nanegal without any note attached.

#### 70. *RUPICOLA SANGUINOLENTA*, Gould, P. Z. S. 1859, p. 100.

Nanegal, two ex. This is the Transandean representative of *R. peruviana*, as *Cephalopterus penduliger* is of *C. ornatus*.

## 71. CEPHALOPTERUS PENDULIGER, Sclater.

Nanegal, two ex.

72. AGRIORNIS ANDICOLA, Sclater, *antea*, p. 77.

Calacali, one ex. *Solitario raro blanco*. Common on the Paramo.

## 73. AGRIORNIS SOLITARIA, Sclater, P. Z. S. 1858, p. 553.

Puellaro, rather common in and about the pueblo.

74. MYIOTHERETES STRIATICOLLIS, Sclater.—*Tænioptera striaticollis*, Sclater, P. Z. S. 1851, p. 193.—*Tyrannus erythropygius*, Lafr. et D'Orb.; D'Orb. Voy. pl. 32. fig. 2 (nec Vieill.).

Puellaro, two ex. "*Solitario colorado*: Irides brownish-white; bill, legs, and feet black. Found solitary among the heaths, &c., between Perucho and Puellaro on the hill-side. Stomach contained insects. Note rather mournful—pee—pee—pee."

## 75. MUSCISAXICOLA ALPINA (Jard.).

One ex. Above Puellaro.

## 76. OCTHOËCA LESSONI, Sclater.

Above Puellaro, one ex.

77. MUSCISAXICOLA MACULIROSTRIS, Lafr. et D'Orb.; D'Orb. Voy. pl. 41. fig. 2.

Calacali, several ex. "Seen always perched upon the heaths or other stunted vegetation: *Solitario chiquito*."

## 78. TYRANNUS MELANCHOLICUS (Vieill.).

Perrucho, one ex.

## 79. MYIODYNASTES CHRYSOCEPHALUS (Tsch.).

Nanegal, one ex.

## 80. CONTOPUS ARDESIACUS (Lafr.).

Perucho and Puellaro.

81. PLATYRHYNCHUS ALBOGULARIS, Sclater, *antea*, p. 68.

Nanegal, one ex.

## 82. CYCLORHYNCHUS FULVIPECTUS, sp. nov.

*Olivaceus; alarum tectricibus rufescente, remigibus fulvescente limbatis, cauda omnino brunnescente: subtus dilutior, pectore et gutture toto fulvescente perfusis, ventre flavescente: rostri mandibula superiore nigra, inferiore pallide carnea, pedibus plumbeis.*

Long. tota 5·5, alæ 3·0, caudæ 2·3.

*Hab.* In rep. Equator.

*Mus.* P. L. S.

Nanegal, one ex., ♂. Irides hazel; bill black above, reddish flesh-colour beneath; legs and feet blue.

This is a typical *Cyclorhynchus*, distinguished from *C. olivaceus* by its smaller size, shorter tail, and the fulvous colour of the breast. It forms a fourth of this section of the group, the others being *C. brevirostris* of Mexico and *C. æquinoctialis* from the Rio Napo.

83. *TODIROSTRUM*, sp.

Nanegal, one ex., in an imperfect state.

84. *MYIOBIUS ORNATUS* (Lafr.).

Nanegal, one ex.

85. *MYIOBIUS VILLOSUS*, Sclater, sp. nov.

*Obscure olivaceus, alis nigricantibus-plumarum marginibus brunnescentibus; uropygio pallide limonaceo-flavo, cauda lucente nigra: pilei cristati plumis rufis, medialiter aureis: subtus fulvo-brunneus, gutture et ventre medio flavescenioribus: rostro superiore nigro, inferiore carneo nigro terminato: pedibus fuscis.*

Long. tota 5·0, alæ 2·8, caudæ 2·4.

*Hab.* In rep. Equat.

*Mus.* P. L. S.

Nanegal, one ex. "Irides hazel; upper mandible black, lower flesh-colour with black tips; legs and feet brownish; gizzard contained insects."

I have already one example of this bird in my collection, received from M. Verreaux and marked "Rio Napo." This species is nearly allied to *M. barbatus* of Cayenne and Brazil, but differs in its larger and stronger form and darker colouring below.

86. *TYRANNULUS CHRYSOPS*, Sclater, P. Z. S. 1858, p. 458.

Nanegal, two ex.

87. *EUPSILOSTOMA*, sp.?

Above Puellaro.

88. *TYRANNULUS NIGRICAPILLUS*, Lafr. R. Z. 1845, p. 341.

Above Puellaro, one ex., agreeing with Bogota specimens.

89. *MIONECTES STRIATICOLLIS* (Lafr. et D'Orb.).

Nanegal. "In gizzard, green berries."

90. *TROGON PERSONATUS*, Gould.

Above Puellaro, one ex. *Pilco*. "Stomach contained remains of insects."

91. *PHAROMACRUS AURICEPS* (Gould).

Nanegal. "Gizzard contained remains of vegetable matter, and a small white stone about a quarter of an inch square."

92. PHAËTHORNIS YARAQUI, Gould.—*T. yaraqui*, Bourc.

Nanegal, seven ex. "Upper mandible black, lower deep red with a black tip; legs and feet reddish."

93. HELIODOXA JAMESONI.

Nanegal, many ex. "Gizzard contained insects."

94. ERIOCNEMIS LUCIANI.

Puellaro and above Puellaro, many ex. Spec. no. 1957 from Puellaro "was feeding on a plant in a morass at the very top of the mountain, the place abounding in mosses, orchids, and ferns, and made no noise either with wings or voice."

95. CÆLIGENA WILSONI (Del. & Bourc.).

Nanegal. "Gizzard contained insects."

96. CHLOROSTILBON ATALA (Less.).

Puellaro, four ex. "Gizzard contained insects."

97. PETASOPHORA IOLATA, Gould.

Calacali, Perucho, Puellaro, and above Puellaro. At the latter place "common in the upper part of the pueblo and rare in the lower."

98. ADELOMYIA MELANOGENYS (Fraser).

Above Puellaro. "Feet reddish flesh-colour; gizzard contained insects."

99. CALOTHORAX MULSANTI (Bourc.).

Puellaro. "On my way here from Perucho I saw three of this species feeding together in a row. I have hunted for it every day since without success until to-day. It seems to be silent on the wing, and in voice, restless, and exceedingly swift of flight."

100. LESBIA AMARYLLIS, Gould.

Calacali.

101. LESBIA GRACILIS, Gould.

Above Puellaro and Calacali. At the latter place "not common. This species is readily distinguishable from all others by the peculiar loud humming noise produced by the wings, audible at a distance of 20 or 30 yards. I did not find it near the *pueblo*, but at some height up one of the hills. Gizzard contained insects."

102. LAFRESNAYA GAYI.

Nanegal, two ex.

103. AMAZILIA RIEFFERI (Boiss.).

Nanegal and Perucho.

104. *MELTALURA TYRIANTHINA* (Lodd.).  
Above Puellaro, many ex.
105. *SPATHURA MELANANTHERA*, Jard.  
Nanegal, one ex.
106. *THALURANIA VERTICEPS*, Gould.  
Nanegal (many ex.), and above Puellaro.
107. *UROSTICTE BENJAMINI* (Bourc.).
108. *HELIANGELUS STROPHIANUS* (Gould).
109. *DORIFERA LUDOVICIÆ* (Bourc. et Muls.).
110. *FLORISUGA MELLIVORA* (Linn.).
111. *LESBIA CYANURA*, Gould.
112. *UROCHROA BOUGIERI*.

Specimens of these six last species were in Mr. Fraser's former collection from Nanegal, besides examples of others already enumerated.

## II. SCANSORES.

113. *PIAYA MEHLERI*, Bp.?  
Nanegal. "Gizzard contained grasshoppers and maggots."
114. *RHAMPHASTOS AMBIGUUS*, Sw.  
Nanegal. "*Moledor*: gizzard contained fruit."
115. *ANDIGENA LAMINIROSTRIS*, Gould.  
Nanegal.
116. *EUBUCCO BOURCIERI* (Lafr.).  
Nanegal, two ex. "Bare space round the eye yellowish; gizzard contained green fruit with minute seeds."
117. *PICUMNUS GRANADENSIS* (Lafr.).  
Two ex. ♂. Irides hazel; gizzard contained caterpillars and insects.  
Nanegal, two ex. "Irides hazel; bill black, base of lower mandible blue; legs and feet greenish; gizzard contained caterpillars and insects."
118. *COLAPTES ELEGANS*, Fraser.  
Calacali, March, adult ♂ and nestling. "Builds in holes of trees; stomachs contained apparently green vegetable matter."

## III. ACCIPITRES.

## 119. CATHARTES ATRATUS.

Perrucho, "common in the *pueblo*, sitting on the roofs," and above Puellaro. Not distinguishable from the bird of the United States. "Irides dark hazel; bill and legs bluish."

## 120. CATHARTES AURA (Linn.).

One ex., ♂, from Puellaro, agreeing with *C. aura* of North America. "*Upanga* (Quichua) from *Upa*—'fool'; *Gallinazo tonto* or *G. Colorado* (Spanish). The inhabitants of the *pueblo* had not observed this species before; it was one of two amongst a community of *C. atratus*. It does not appear to be common anywhere. In most places I have observed it singly or in pairs. In Pallatanga it is called *Chalpan*: mandibles very pale yellow; head of a port-wine colour, the corrugations from the crown down the back of the neck and coruscations before and under the eyes white; legs and feet pale yellow; gizzard contained short hair and small lines."

## 121. TINNUNCULUS SPARVERIUS (Linn.).

Calacali and Puellaro, three ex. At Calacali "very common in pairs everywhere about the town." Stomach of one contained "a mouse," of another "grasshoppers."

## 122. ACCIPITER ERYTHROCNEMIUS, Kaup.

Nanegal, one ex. "Irides, legs, and feet yellow; bill at the base blue, with the tip black." Stomach contained "flesh and feathers."

123. MICRASTUR GILVICOLLIS (Vieill.).—*M. concentricus*, Auct.

Nanegal, one ex., adult. "Irides reddish; bill black above, yellow beneath; face, legs, and feet orange; gizzard contained grasshoppers and the lower jaw of a lizard."

124. STRIX PUNCTATISSIMA, G. R. Gray, Voy. Beagle, Zool. p. 34, pl. 4.

"*Lechusa*; from the roof of the house at Puellaro."

A young bird, apparently of this species, of which Mr. Fraser has sent the adult from Quito.

## 125. SYRNIUM ALBOGULARE, Cassin.

Wooded heights above Puellaro. "Adult ♂ and young, taken together in a large tree; in the stomach, remains of beetles and other insects."

## 126. PHOLEOPTYNX CUNICULARIA (Mol.).

Calacali. "Irides bright straw-colour; beak bluish; gizzard contained insects. I saw some twenty or thirty of these birds on the side of a hill, mostly in pairs. They live in holes in the ground. Their flesh is eaten by the natives."

## IV. COLUMBÆ.

127. *COLUMBA RUFINA*, Temm.

Nanegal. In the stomach "fruit and grit."

128. *ZENAIDA HYPOLEUCA*, Bp.

Calacali. "Very common; stomach contained small seeds and grit."

## V. GALLINÆ.

129. *ORTALIDA MONTAGNII*, Bp.Nanegal and above Puellaro. At latter place "common;" gizzard contained a fruit called *Mora*, which is a species of *Rubus*, according to Dr. Jameson.130. *RHYNCHOTIS PERDIX* (Mol.)?Calacali and Puellaro. "*Perdix*: in gizzard, seeds of various sizes and grit. Said to be common high up in the mountains, where they are taken by dogs; I have never seen them except in pairs."Nearly allied to *R. perdix* of Chili, but probably of a different species.

## 9. ON A NEW SNAKE FROM THE GALAPAGOS ISLANDS.

By DR. ALBERT GÜNTHER.

The genus *Herpetodryas*, being composed of those *Dryadidæ*, which have the maxillary teeth of equal length and entirely smooth, comprises snakes from America and from Madagascar. The following species comes from the Galapagos Islands, and appears to be the only Snake as yet known to inhabit that group\*.

*HERPETODRYAS BISERIALIS.*

*Diagnosis.*—Scales in nineteen rows; eight upper labials, three posterior oculars. Light brown, with a dark brown dorsal band, serrated on the anterior portion of the trunk, and formed by a double series of spots on the middle and on the posterior part of the back. A dark brown streak from the eye across the cheek. Belly irregularly dotted with brown.

\* The first mention of a Snake on these islands seems to be in Dampier's 'Voy. Round the World,' ed. 7. vol. i. 8vo. Lond. 1729, p. 103:—"There are some Green Snakes on these islands; but no other land-animal that I did ever see."

Darwin says in his Journ. of Research., p. 381, speaking on the Zoology of the Galapagos Islands:—"There is one snake which is numerous; it is identical, as I am informed by M. Bibron, with the *Psammophis temminckii* from Chile." Although subsequently, in the 'Erpétologie Générale,' nothing is mentioned by Duméril and Bibron about the occurrence of *P. temminckii*, or of any other snake, in these islands, that determination of Bibron may possibly be correct. If such be the case, there are two species of Snakes in that group of islands.

*Hab.* In Charles Island (Galapagos). Typical specimen in the Collection of the British Museum.

*Description.*—The head is rather depressed, flat, and, like the trunk and tail, somewhat elongate; the eye is of moderate size, with the pupil round. The rostral does not reach to the upper surface of the snout; the anterior frontals are square, the posterior ones about twice the size and subquadrangular; the vertical is rather slender, twice as long as broad; the occipitals triangular and rather pointed posteriorly. The nostril is situated between two shields; the loreal nearly square; the anterior ocular extends to the upper surface of the head, and is in contact with the vertical. There are three posterior oculars, the middle of which is the smallest, the inferior forming a part of the lower portion of the orbit; the temporal shields are scale-like and rather irregularly arranged. There are eight upper labials, the fourth and fifth coming into the orbit. The median lower labial is triangular, and of moderate size; ten lower labials, the first of which is in contact with its fellow, behind the median shield. There are two pairs of elongate skin-shields of equal size. The scales are perfectly smooth, in nineteen rows, rhombic, those of the outer series being rather larger. Ventral plates 209; anal bifid; caudals 108.

The ground colour is a light brownish-grey: a vertebral band, formed by dark brown spots, begins from the occiput, and is gradually lost on the middle of the tail; it is continuous anteriorly, and serrated on both sides, but gradually dissolved into two series of brown spots, the spots of each series being confluent on the end of the trunk; there is a dark brown streak across the temple. The belly is greyish, and finely and irregularly speckled with brown.

	inches.	lines.
Total length . . . . .	14	3
Length of the head . . . . .	0	5
Greatest width of the head . . . . .	0	3
Length of the trunk . . . . .	10	0
Length of the tail . . . . .	3	10

The maxillary teeth are of moderate size, of nearly equal length, in a continuous series, and entirely smooth.

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February 14, 1860.

John Gould, Esq., F.R.S., V.P., in the Chair.

Dr. Shortt, F.Z.S., made some remarks on the Civet-cats of India, and the native method of extracting the perfume.

Dr. Crisp exhibited two stuffed specimens of the Cock of the Rock (*Rupicola crocea*) which had been brought alive to and had died in this country.







SECTION OF THE STEM OF *PHLODENDRON*





PLATE LXXVIII.

PLATE LXXVIII.

SACCULATED PEYERIAN GLAND OF YOUNG GIRAFFE

Mr. Bartlett exhibited a head of a variety of the Common Goose in which the feathers at the back of the head were reversed so as to form a sort of ruff. It was stated that this variety had been perpetuated for several generations at the farm of J. C. Chaytor, Esq., at Croft near Darlington, and if properly treated by a judicious selection of breeding birds, might doubtless be made the origin of a new domestic breed of geese. Mr. Bartlett also exhibited the gizzard of a Nicobar Pigeon, from a specimen recently deceased in the Society's Gardens, and called attention to the peculiar stony development of the epithelial lining.

Mr. Scater exhibited a specimen of a large Horned Owl shot by Major W. E. Hay, F.Z.S., upon the borders of the Pângkông Lake in Thibet. He was disposed to consider the bird as a pale variety of *Bubo maximus*. Mr. Blyth (Journ. As. Soc. Beng. xix. p. 506) had noticed the report of the occurrence of this bird in the Himalayas, but Mr. Scater believed that this was the first recorded specimen which had been obtained and examined.

Mr. H. W. Bates exhibited a frugivorous Bat from Ega on the Upper Amazon, which he believed to belong to an undescribed species of *Phyllostoma*.

The following papers were read :—

1. CONTRIBUTIONS TO THE ANATOMY OF THE GIRAFFE. BY  
T. SPENCER COBBOLD, M.D., F.L.S.

(Mammalia, Plates LXXVII., LXXVIII.)

Notwithstanding the apparent completeness of that elaborate Memoir on the Giraffe by Prof. Joly and Mons. A. Lavocat, contained in the third volume of the 'Transactions of the Strasburg Natural History Society\*,' combined with the more recent 'Osteologische Bemerkungen' of Dr. George Jäger†, there are still many points of interest associated with the study of the structure of this aberrant ruminant which remain to be elucidated. Some of these are matters of dispute, and a few have reference to the existence of peculiarities not known to occur in any other living mammal.

The President and Office-bearers of the Zoological Society having liberally afforded me an opportunity of examining the carcass of a

\* Recherches historiques, zoologiques, anatomiques, et paléontologiques, sur la Giraffe (*Camelopardalis Giraffa*, Gmelin), par MM. N. Joly et A. Lavocat, Mém. de la Soc. d'Hist. Nat. de Strasbourg, tom. iii. livr. 3<sup>e</sup>, 1840-1846. This essay is illustrated by seventeen plates, many of the figures being borrowed from Prof. Owen's Memoirs, published in the Zoological Society's Transactions. It is satisfactory to notice, however, that the sources whence they have been obtained are carefully acknowledged.

† Osteologische Bemerkungen, von Dr. George Jaeger, Acta Acad. C. L. C. Nat. Cur. vol. xxvi. part i. 1855, Abschnitt 3. Oeffnung auf der Oberfläche des Stirnbeins einer jungen Giraffe, p. 99. Bemerkungen über die Hörner und Epiphysen, sowie über die Sinus des Schädels in Vergleichung mit andern Wiederkäuern. Vergleichung der Grossenverhältnisse einiger Knochen der Giraffe mit denen des fossilen Sivatherium, p. 102.

young male Giraffe, I have been enabled to confirm certain important discoveries previously made by myself in connexion with the intestinal canal, whilst, at the same time, I have some additional facts to contribute towards our knowledge of the development of the intracranial sinuses. The intestinal peculiarities above alluded to had been entirely overlooked by the Cuviers, Isidore and Etienne Geoffroy Saint-Hilaire, Home, Owen, and all other anatomists previous to the date when the facts I refer to were originally made public,—namely, at the meeting of the British Association held at Glasgow in 1855; and it may also, with equal truth, I believe, be remarked, that no one has, since that time, had an opportunity of confirming or refuting the statements then and there set forth. The anomalous structures in question are briefly described in my article “Ruminantia,” in the supplement to Dr. Todd’s ‘Cyclopædia of Anatomy and Physiology,’ and they have also been specially noticed elsewhere\*.

The young Giraffe which so recently formed an attractive feature in the Society’s menagerie was born in the Gardens on the 6th of July 1859. From the period of its birth until the day of its death, it had never exhibited any symptoms of indisposition, whilst its sportive gambols and rapid growth were the subject of general remark. Early in the morning of the 2nd of December, on entering the Giraffe-house the keeper observed the animal struggling to raise itself from the ground, but, in spite of timely assistance, these efforts proved unavailing. It soon became apparent that the limbs were partially paralysed, and the animal expired in about two hours from the time it was first observed prostrate. The young Giraffe had clearly sustained some injury, which was in all probability occasioned by a kick from the mother, when the former was attempting to reach the teat. This supposition derives strength from the circumstance that the mother would allow lactation to be carried on only at certain intervals, and therefore the importunate cravings of the “fawn” frequently exposed it to rough usage, or even violent resistance. I am informed by the experienced keeper (on whose care the condition of the young animal up to the time of its death reflects

\* Bearing upon this subject, I have contributed the following papers, notices, &c. :—

1. Account of the Dissection of a Giraffe. Physiological Soc. Rep. in Edin. Month. Journal for April 1854.
2. Notes on the Anatomy of the Giraffe. Communicated to the Royal Physical Soc. of Edin., and published in the Ann. and Mag. of Nat. Hist. for June 1854.
3. Description of a New Species of Trematode infesting the Giraffe. Read at the Glasgow Meeting of the Brit. Assoc. Sept. 1855. See Reports. Also published, with a coloured plate, in Edin. New. Phil. Journal, Oct. 1855.
4. On a remarkable pouched condition of the Glandula Peyerianæ in the Giraffe. Edin. New Phil. Journ. for Jan. 1856, with a coloured plate. Also noticed in British Assoc. Rep. for the preceding year.
5. See also, under “Intestinal Glands,” additional observations, Article “Ruminantia,” in Supp. to Dr. Todd’s Cyclopædia of Anat. and Physiol. p. 539, with two figures. 1859.
6. Also a brief notice (with good fig.) in the Mammalian Division of the “Museum of Natural History,” in the general characters of the Order Ruminantia, vol. i. div. i. p. 157, 1860.

the highest credit) that this resistance on the part of the parent is quite natural and frequent with giraffes in general; and this leads me to infer, therefore, that the young animal must have struck its head violently against the woodwork of the stall when in the act of escaping from the kicks of its annoyed parent.

In a formal note addressed to the Secretary, and dated 7th Dec. 1859, I have already communicated the results of a *post mortem* examination of this animal, made by Mr. Bartlett and myself. That dissection has fully explained the immediate cause of the Giraffe's death, for, as then observed, "a longitudinal section of the skull showed extensive injury to the vessels internally, the large sphenoidal sinus being filled with extravasated blood. The upper lip was rather deeply cut, evidently from sudden contact with the middle incisor-teeth. The vessels of the brain were gorged, but there was no laceration of the cerebral substance. All the viscera were perfectly healthy." The precise locality of the blood-extravasation is clearly indicated in the accompanying drawing (Pl. LXVII.). Here it will be noticed that the submucous tissues, both above and below the palato-maxillary bones, are completely ecchymosed, whilst the large sphenoidal sinus below the *basis cerebri* is choked with blackish clots. Traces of extravasation existed within the cranium, and the meningeal vessels were everywhere unnaturally distended.

If the drawing be further examined, and a comparison be instituted between it and the artistic figure of a similar longitudinal section of the dried adult cranium accompanying Prof. Owen's Memoir, published in the second volume of the Society's Transactions, it will be observed that the relative differences in the disposition of their parts are singularly marked. In the adult animal the fronto-parietal air-sinuses extend backwards from the centre of the facial region to the occipital border; but in the young giraffe under consideration, the anterior part of the head is only occupied by a single frontal sinus of comparatively limited dimensions, the cavity being situated immediately below the naso-frontal eminence. In the former, again, the sinuses are complicated by numerous lamellar partitions, which in the latter are merely represented by curved ridges whose smooth and rounded borders project internally from the parietes of the cavity; two or three of these linear elevations are seen in the annexed illustration. Another still more striking difference, and one which results from the non-development of the parietal sinuses, is that relating to the size and position of the brain. In the adult animal the transversal area of the cerebrum on section, taken immediately behind the lateral horns, is manifestly less than half that of the cranium divided at a similar spot; whereas in the Society's young giraffe, a like comparison will show that the transversal area of the brain is equivalent to at least two-thirds of that of the cranium. And even yet more noticeable is the circumstance that the brain of the full-grown giraffe lies on a plane almost level, and continuous, as it were, with the nasal passages; but in the young individual, the cerebrum, though nearly parallel in direction, is at the same time placed at a very much higher level. In the

one the upper border of the nasal passage is on a line with the inner or vitreous table of the fronto-parietal walls of the cranium, but in the other the same limiting border of the nasal inlet is almost level with the floor of the cerebral cavity. In the young animal the cavity of the frontal sinus extends somewhat further backwards at the sides than it does in the median plane; nevertheless, the accompanying illustration affords a tolerably fair estimate of its capacity. The sphenoidal sinus exhibits comparatively limited dimensions.

In the present communication I do not enter into details respecting the form and relations of the separate cranial elements, reserving these (as well as considerations affecting the dentition, and also certain skeletal peculiarities) for future observation, when I shall have had an opportunity of more minutely examining the dried bones. In the meantime, however, I cannot allow this opportunity to pass without distinctly expressing my adhesion to the early opinion and carefully recorded observations of Rüppell, as to the existence of a third epiphysial horn in the male Nubian Giraffe. I have satisfied myself as to the substantial accuracy of Rüppell's views, not merely from the dissection of two young males, but from a close inspection of several adult crania contained in the Museum of the Royal College of Surgeons; and I have been even more persuaded as to the certainty of the presence of a third so-called horn in this animal by an examination of the admirably prepared skeleton of a male giraffe preserved in Dr. Harrison's Museum at Trinity College, Dublin\*, together with the skull of another specimen which died in the Society's Menagerie about two years ago. I have recently been informed that the animal last mentioned was a female, which, if true, renders the argument still more interesting. At all events, I agree with those who, with Rüppell and Cuvier, insist upon the recognition of a third horn in the male, and, although opposed in this persuasion by the opinion of Prof. Owen, I am nevertheless glad to observe its existence fully corroborated by the independent researches of Jäger†.

\* The Dublin specimen (also bred in the Zoological Society's Menagerie) was a remarkably fine animal. The late Dr. Ball informed me that it died during sexual excitement, while in the act of assaulting a sheep which had been placed in the same paddock.

† Dr. Jäger makes the following statement in a foot note to his Memoir previously quoted:—"In the skull of a young male in the collection at Munich, whose horns are scarcely two inches long, and likewise separated, there is, in the place of the third central horn, a rather strongly marked elevation of the frontal bone, but no trace of an epiphysis. In the skull (19 inches long) of a male received a short time ago from the north of Africa, through Dr. Heuglin, which skull we believe to be mature, the suture of the hind horns (14 inches high) is still perceptible, but the serrated borders are almost firmly united to the frontal and parietal bones. The mesial horn, however, is still quite separated by the epiphysial cartilage from the frontal and nasal bones, whose sutures are not yet obliterated, as also obtains in the other cranial bones. The anterior margin of the central horn-bone projects about one inch over the posterior limit of the nasal bone. From thence the anterior part of the horn rises to the tip, forming a very gradual slope, while the posterior inclination is comparatively steep and short. It results from this that the central horn unites with the bones much later than the hinder horns, which are common to both sexes."



Before passing to the consideration of certain intestinal peculiarities, I cannot omit noticing a few additional points of general interest. As in the aged animal, so also in the young individual, the cerebellum is situated on a level with, and is not overlapped by, the cerebrum. In the Edinburgh specimen I found the rudimental uvula to consist of three small, conical, and closely approximated papillæ, but in the present example there are only two minute processes of a similar character, united at the base and subsequently diverging from one another at right angles. From former examinations, I feel quite certain that the fibres of the *ligamentum nuchæ* do not exhibit, under the microscope, any transverse striation, neither in the fresh state nor when dried, and I cannot but suppose that the appearances indicated by Prof. Quekett must have been accidental. Except in the truly anomalous instance described by Prof. Owen—where a double gall-bladder occurred in a female—all previously recorded dissections of the giraffe point to the absence of a gall-bladder; and this rule, which also holds good in the case before us, very strongly indicates the Cervine affinities of the genus.

Without entering upon a minute description of the parasites infesting the Giraffe, I may here notice that a careful scrutiny of the viscera of the Society's young specimen has enabled me to add yet another species to the list of Entozoa. From the liver and sublingual cellular tissues of the Edinburgh specimen I obtained numerous *Cysticerci* and *Cercariae*, together with about forty examples of an unusually large fluke\*; and though neither of these helminthic forms existed in the present instance, the cæcum was nevertheless abundantly supplied with *Trichocephali*, markedly different from those so commonly found in man. Provisionally, I recognize this nematode entozoon under the combined generic and specific title of *Trichocephalus gracilis*†.

In regard to certain peculiar modifications of structure found in the alimentary canal, I have, in the first place, to remark the presence of valvular folds at the anterior border of Peyer's glands. All the agminated follicles or patches do not exhibit this singular folding, only three or four of the glands being thus extended; in these, however, the duplication was even more developed than represented in my original figure in the Article "Ruminantia" previously cited. In the Society's young giraffe, also, the lateral margins of the glands are more elevated, whilst well-marked transverse ridges pass across the follicles from side to side. Morphologically speaking, these rudimental partitions undoubtedly represent the lobular foldings of ordinary compound glands—a view which is more clearly brought out by considering the complexity of that unique differentiation which I have next to notice. From the juvenile character of the Society's animal I scarcely expected to detect more than a mere

\* *Fasciola gigantea* mihi, in Mem. loc. cit.

† From other animals which have more or less recently died at the Society's Menagerie, I have procured a variety of interesting Entozoa. See two Memoirs in the Linnean Society's Transactions, vol. xxii. pp. 155, 363. Plates 31-33, and 63.

trace of those remarkable glandular pouches which I originally discovered in a giraffe about two years old; in this, however, I have been agreeably surprised, and have found a structure still more complicated, although the secreting or follicular tissue is so little marked as to be scarcely visible to the naked eye (Pl. LXXVIII.)\*. In Wombwell's giraffe, which died at Edinburgh, only seven of the sacs were found complete and bordered by very attenuated walls; but in the Society's specimen there are at least twenty circumscribed fossæ. Ten of these exhibit very small outlets, whilst two or three of the larger and more patent sacculi display secondary pouches in their interior. As the drawing sufficiently illustrates the relative form and disposition of these sacs, it is scarcely necessary to describe them more fully; but no one, I think, can possibly fail to recognize the morphological signification of this singular development in its entirety. Among the various known modes of extension of the intestinal glandular element, there is nothing comparable to it throughout the entire range of the vertebrate series. Special induplications of the alimentary membranes are here and there produced to meet the exigencies of certain mammalian species, but no one, I believe, has hitherto observed a similar development exclusively involving Peyer's patches. It is now, therefore, even more perceivable that the compound agminated follicles may be legitimately associated with the highly developed compound lobulated glands, such as the sublinguals, the parotids, and the tonsils; and the latter, again, may be regarded as morphologically analogous, and even serially homologous with the highly organized liver and pancreas. In the Giraffe, indeed, the tonsils display a remarkably capacious excretory outlet common to all the lobules—a circumstance rendering the above comparison still more significant.

There is also yet another aspect in which this honeycombed intestinal gland is entitled to assume especial prominence, namely, as a zoological character. Here I am aware that I am likely to meet with opposition from those who ignore the value of anatomical investigations; nevertheless, with all due deference to others, I must, in the present instance, be permitted to uphold the validity of the persuasion which argues that no viscus or system of tissues should be excluded from the characters employed in the determination of zoological affinity—certainly not, at least, when any marked deviation from a classic, ordinal, or generic type is sufficient to impart

\* It is remarkable that Prof. Owen should have entirely overlooked this peculiar formation, since nothing can be more precise and correct than his description of the subjacent ilio-colic valve. In the *Memoir, loc. cit.* p. 227, he says:—"The termination of the ilium forms a circular tumid lip within the cæcum, and presents a less efficient mechanical obstacle to regurgitation than in the human subject."

Prof. Joly and Mons. Lavocat, although they have given a complete résumé of the writings and investigations of no less than forty eminent anatomists and zoologists, thus summarily dismiss their account of the cæcum (*Mem. l. c.* p. 35):—"Le cæcum n'offre rien de particulier, si ce n'est son volume assez peu considérable, quand on le compare à celui des autres ruminants, et surtout à celui du cheval."

distinctive cogency to the balance of hypothetical analysis. I firmly believe that the comparative perfection of our knowledge of the proper definitive allocation and relative position of organized beings—whether arranged in groups, species, or individualities—depends solely on the accuracy and grasp which an extended experience and observation alone can supply; and I respectfully submit that no structural phenomenon, great or small, external or internal, scarce or invariable, can be too unimportant to be carelessly eschewed. We have seen the highest animal existences organically linked with the members of the vegetable kingdom by the discovery of starch in the human brain, whilst the abundant presence of cellulose in the Tunicated Molluscs affords a more striking illustration of the fundamental unity of all organized being. Without enlarging further, however, on general facts and principles, I return to the direct subject-matter of this paper, in order to enforce more strongly the zoological value of the glandular body above described. The giraffe is an animal admittedly osculant between the Cervine, Antilopine, and Cameline ruminants—partaking of characters more or less common to all these groups; and here we have (in addition to the peculiar horns, and the partially distinctive cranial, lingual, and external modifications subservient to the animal's mode of existence) an entirely unique development connected with the digestive system. When, therefore, it is considered that this marked peculiarity is not known to be shared by the allied families above referred to, and that the complexity of the organ has arrived at a point far beyond the ordinary development of Peyer's patches, I think it but fair that zoologists should candidly admit the utility of anatomical researches and welcome any structural discovery which gives aid to their definitions, and which, in the instance under consideration, palpably justifies the recognition of the giraffe as the type of a separate family. I consider the force of this argument is in no degree lessened by the circumstance, that, on separate and at the same time thoroughly judicious grounds, Dr. Gray and others have already advocated this separation, the most striking character which they employ for this purpose having reference to the existence of pseudo-ceratophorous epiphyses permanently invested by a hairy integument.

In conclusion, I may remark that zoological science should not be allowed to resemble an eviscerated carcass, but its proportions should be shaped and its constituent parts welded together by data gathered from every phase of biological inquiry, though this may occasionally involve a prominent recognition of deep-seated anatomical appearances, and sometimes even extend to purely chemico-vital manifestations.

## 2. ON THE OCCURRENCE OF AMERICAN BIRDS IN EUROPE. BY HERR H. GÄTKE OF HELIGOLAND.

The route by which American birds proceed to Europe is, as Yarrell justly terms it, "an interesting problem, of difficult solu-

tion." For years this solution has occupied my attention, and although I have myself always been convinced that such of these entirely American birds as occasionally visit Europe *do* reach us by a passage across the Atlantic, this remains a mere opinion, carrying no weight if unsupported by facts, or by at least sufficient argument to make good the question at issue.

The mere comparative review of the occasional visitors among the birds of Great Britain and of Germany will lead to the conclusion that the route of American birds to Europe must needs be a voyage across the Atlantic, for, almost all the additions to the birds of Europe, of species *purely American*, have been obtained in Great Britain—which could not have been the case if they had proceeded in any other than an eastern direction—whilst the additions by Germany, furnished to the European Ornis, consist nearly entirely of birds belonging to Asia.

However striking the result of such a comparative review may be, one question will always present itself, namely:—Whether it be possible for a bird to sustain an *uninterrupted* flight sufficient to carry it across the wide expanse of the Atlantic. I am convinced that this is possible, and shall endeavour to prove such possibility.

This purpose necessitates a measure for the rate of locomotion of a bird through the atmosphere. For a long time I vainly endeavoured to obtain reliable data upon which to found an estimation of the rate of flight of birds—when at last I hit upon a passage in Yarrell's 'British Birds,' ii. p. 295, where, speaking of the Carrier Pigeon, he mentions the fact of one of these birds having performed a flight of 150 miles in an hour and a half: it was on the 24th of June 1833; the Pigeon flew from Rouen to Ghent; sixteen others flew the same distance in two hours and a half.

Wonderful as this instance of swiftness of the flight of a bird may appear, it certainly is still surpassed by birds when on their periodical migrations; for, the above feat was accomplished by an individual hatched and reared in at least semi-confinement, whose powers of flight consequently could not be nearly so well developed as in a bird grown up wild and free, which nearly every hour of his life has to depend on the utility of its wings, either for the purpose of overtaking its prey, or for that of escaping from being caught.

Laying down, therefore, 100 geographical miles per hour as the rate of flight of birds during distant migration, one keeps—after the above—quite within safe bounds, and, at this rate, the 1600 geographical miles from Newfoundland to Ireland would be effected in sixteen hours. No ornithologist will doubt for a moment the capability of a healthy bird to sustain a flight of that duration; during the long summer days many of the *Hirundinidæ* are on the wing for as long a period, and although their flight may be interrupted by occasional rests of very short duration, it is performed in the lower, less buoyant atmosphere, and consists of so many evolutions, that most decidedly it must on the whole be much more tiresome than the straight path in the pure upper regions of a bird bent on the performance of one long pilgrimage.

Even supposing that birds become exhausted before accomplishing the passage across the ocean, observations I have made in the vicinity of this island have fully convinced me that small birds, such as Thrushes, Buntings, Finches, &c., are able to rest on the sea—even when a little in motion—and afterwards to resume and pursue their flight with fresh vigour. Of this I shall give the particulars further on; but, for the present, return to the above question, by giving an instance of endurance on the wing of a species which, with pretty good certainty, may be said every spring to perform in the period of one night a flight of more than 1200 geographical miles; namely, from Egypt to Heligoland—the bird in question being a particular form of Blue-throated Warbler, *Sylvia cœrulecula*, Pallas.

This pretty little bird, noted not at all either for rapidity or great endurance of flight, has its summer quarters in the high northern latitudes of Sweden, Finland, and Siberia, whereas during the winter months it is staying principally in Egypt. On its spring migration, which takes place during the earlier half of May, the first place north of Egypt where it is to be found with certainty in pretty considerable numbers is Heligoland. Nowhere in the whole intermediate distance is it met with but as a great rarity—not even on the neighbouring north coast of Germany—whilst here in Heligoland I have oftentimes obtained it in such numbers that more than twenty of the finest adult male birds have been bought by me in one day, and perhaps the same number by the bird-stuffers of the island. The foregoing admits of one conclusion only, namely, that this little bird performs the passage from Egypt to Heligoland in one uninterrupted flight, travelling—as many of the other small *Insectivora* do—during the night, starting towards sunset and arriving here about sunrise, or a little later, the time occupied being from twelve to fourteen hours. The distance from Egypt to Heligoland being about 400 geographical miles less than that between Newfoundland and Ireland, the rate of flight of this delicate little bird may be put down the same as that rendered by the above-mentioned Carrier-Pigeon, and consequently furnishes a further proof that a healthy well-flying bird is able to cross from the nearest point of America to Ireland without rest or any extraordinary support whatever.

In the foregoing I alluded to the aptness of non-natatorial birds of resting, in case of exhaustion, on the sea, and of rising from it after having recovered sufficient strength to resume their flight; and that at times too, when the water is far from being unruffled. This statement is based on the following observations. One day, when out in a boat shooting, about two or three miles from Heligoland, I observed a very small bird swimming on the water. Neither the boatman nor myself being able to discern what species it belonged to, we became very eager to secure the stranger—conjecturing that it would turn out to be some wonderful rarity. When preparing to fire, I fortunately discovered that the expected prize was nothing but a Song-thrush! Immediately our desire to kill was changed into compassion: the “poor Thrush” in so piteous a situation was to be “saved.” But how great was our astonishment, when, upon the approach of the

boat, the bird without any apparent difficulty rose from the water and flew towards Heligoland in first-rate style! Another time we saw a Snow-Bunting, evidently exhausted very much, because it was floating scarcely 500 yards from the island. At the approach of my boat, this bird also very lightly rose from the water, but it was so weak that it had to resume its unnatural resting-place after proceeding about thirty or forty yards towards the rocks. We went after it again, and for a third time, but with the same result, whereupon we refrained from all further attempts at forcing our well-intended assistance upon so obstinate a fellow—the more so, as we entertained no doubts that after a little rest he would obtain a more solid footing without any help of ours.

I will give one more instance of this propensity in birds—in all my experience, the most striking: this time it was a Mountain-Finch which had been compelled to alight for rest on the water of the sea; it was about three miles east of Heligoland. When this bird was approached by the boat, it rose very easily, mounted into the air to a great height—as birds do when starting for their migratorial excursions—and then struck out steadily in a southern direction, *without taking any notice whatever of the island.*

Although I believe in the foregoing to have proved sufficiently the *possibility* of birds being capable to cross on the wing from the United States of America to Great Britain, the greatest *probability* that they do so is still shown by the proportion the number of American birds obtained in Great Britain bears to that of those obtained in the whole of Europe. Yarrell, in his 'British Birds,' 1845, mentions more than forty instances of that description; *Tringa rufescens* and *Scolopax grisea* having been obtained six times each! whereas, Germany, Holland, and France together offer but very few instances—some of which scarcely rest on good authority.

Heligoland seems to form a happy centre. Here the Gulls of the Arctic Sea, *Larus rossii* and *sabini*, meet the Numidian Crane, *Grus virgo*, *Lanius phœnicurus*, and other African birds; whilst the United States send *Mimus rufus* and *T. lividus*, *Sylvicola virens*, *Charadrius virginicus*, and others, to meet deputations from the far east of Asia consisting of *Turdus ruficollis* and *T. varius*, *Sylvia javanica*, *S. caligata*, and *S. certhiola*, *Emberiza rustica*, *E. pusilla*, and *E. aureola*, *Pyrrhula rosea* and a great many others.

All these birds, together with a great number of acquisitions quite as valuable for the European Ornis, *all captured on this island*, are preserved in my collection—a collection, which, although scarcely approaching to three hundred specimens, has, by Blasius, been pronounced to be "the most interesting between Paris and Petersburg."

Heligoland, January 1860.





PLATE CLIX

M. & N. B. D. 1850

PYLIELIA MONSIEUR



3. ON SOME BIRDS COLLECTED IN ANGOLA. BY DR. G. HARTLAUB, OF BREMEN, AND J. J. MONTEIRO.

(Aves, Pl. CLXI.)

The twenty-two birds hereinafter enumerated were obtained by me in Angola, at the port of Ambriz, and at Bembe, about 130 miles in the interior, during my residence there in 1858 and 1859. Bembe is a Portuguese settlement, where there are Malachite copper-mines, at present worked by an English Company. It lies in a mountainous district, belonging to the clay-slate formation, traversed by numerous valleys and water-courses, in which the vegetation is very luxuriant. Dr. G. Hartlaub, of Bremen, who is our best authority on West African Ornithology, has kindly determined the species.—(J. J. M.)

1. *MICRONISUS MONOGRAMMICUS* (Temm.), var. *MERID.* *Differt a specimine Senegalensi fasciis abdominalibus latioribus; fascia caudæ media strictiore; notis longitudinalibus gutturis multo strictioribus minusque conspicuis.*

Long. tota circa  $13\frac{1}{2}''$ , alæ  $8'' 2'''$ , caudæ  $5\frac{1}{2}''$ , tarsi  $1'' 8'''$ .

I consider this bird to be a southern local race of the well-known *M. monogrammicus* of Senegambia and the upper Bahr-el-Abiad, where Brun-Rollet and Heuglin found it.—(G. H.) Brought to me alive at Ambriz on the coast, and kept some days alive.—(J. J. M.)

2. *CAPRIMULGUS FULVIVENTRIS*, n. sp. *Supra in fundo late fulvo-rufescente nigricante fasciolatus et vermiculatus; maculis pilei medii subtriquetris nigerrimis, pulchre conspicuis; alæ parte dorso proxima simili modo notata; remigibus nigris, macula alba ut in congeneribus notatis; tertiariis alarumque tectricibus fulvo nigroque variegatis; reatricibus 4 mediis obscurius nigro rufoque variegatis et irregulariter fasciatis, binis externis pro maxima parte albis, tertia parte basali unicolore nigra; gutture in fundo late fulvo nigro fasciato; macula gulari et vitta brevi triangulari albis; pectore et abdomine late fulvis, unicoloribus, subalaribus et subcaudalibus late fulvis; vibrissis rictalibus brevibus, debilibus, rostri apice nigro.*

Long.  $8\frac{1}{2}''$ , alæ  $5'' 7'''$ , caudæ  $3\frac{1}{2}''$ , rostr. a fr.  $5'''$ .

A true *Caprimulgus*, and very probably a new one.—(G. H.) Common at Bembe and on the coast. In flocks of five or six, hawking for flies in the evening close to the ground. Eyes very large. Native name "*Lubutarubuta*."—(J. J. M.)

3. *CORACIAS CAUDATA*, L.

Very common on the coast, but not met with inland beyond twenty or thirty miles. Seen flying about with irregular flight all through the day, chattering much, and feeding on *Orthoptera*. One kept five months in captivity subsisted on raw beef. Native name "*Tacamantaca*."—(J. J. M.)

## 4. HALCYON CINEREIFRONS, Vieill.

The first description of this well-known and widely distributed species was made from an Angolan specimen obtained by Perrein. Cassin has indicated it as occurring about Natal.—(G. H.)

Not uncommon near Bembe in the thick woods at the bottoms of the ravines, where there is water. Subsists on insects. Seen sitting on a branch, head aloft, whence they dart forth to secure their prey, and return. Called "*Telampuica*."—(J. J. M.)

## 5. NECTARINIA ANGOLENSIS, Less.

## 6. NECTARINIA CYANOLÆMA, Jard.

## 7. NECTARINIA CHLOROLÆMA, Jard.

## 8. NECTARINIA CYANOCEPHALA, Sh.

These four Sunbirds were all obtained at Bembe, where this group of birds is abundant, both in species and individuals. They are seen in the hottest part of the day haunting the flowering plants, never settling but hovering, whilst they extract the honey from the flowers.—(J. J. M.)

Three of those *Nectariniæ*, Nos. 5, 7 and 8, were already known to inhabit Angola, the fourth, *N. cyanolæma*, had been collected only in those northern parts of Western Africa, Fernando Po, Gaboon, and even as high up as Galam, whence there is a specimen in the Paris Museum. Three very fine species of *Nectariniæ* collected by Perrein in Angola, *N. erythrothorax*, *N. rubescens*, and *N. perreinii*, all three described by Vieillot, have never been found again, and do not exist in any collection. We call the particular attention of Mr. Monteiro to these lost species.—(G. H.)

## 9. ANTHUS GOULDII, Fras.

Very probably this species. The pectoral spots nearly obsolete. The whole colouring singularly uniform.—(G. H.) Very common on the grassy plains near Bembe. Rises with a whirring noise from the grass when disturbed, but does not sing or utter any note.—(J. J. M.)

## 10. COSSYPHA NATALENSIS, Smith.

This fine species was never known before to inhabit Western Africa.—(G. H.) Frequents the woody ravines near Bembe. The muscular stomach of one specimen examined contained remains of insects. Native name "*Taranganga*."—(J. J. M.)

11. BUTALIS LUGENS, n. sp. *Cinerea, subtus pallidior, abdomine imo medio, crisso et subcaudalibus albis; subalaribus cinereis; gula nonnihil longitudinaliter varia; alis et cauda fusciscenti-nigris; scapis plumarum pilei nigris; tectricibus alæ minoribus scapularibusque nigris, obsolete cinerascete limbatis; rostro nigro, pedibus fuscis.*

Long.  $5\frac{1}{2}''$ , rostr. a fr.  $6'''$ , alæ  $2'' 8'''$ , caud. a bas.  $2'' 3'''$ , tars.  $6\frac{1}{2}'''$ .

Apparently a true *Muscicapa*, or, subgenerically, a *Butalis*, though the beak is rather long. In the Stutgardt collection there is a specimen of this bird from the interior of South Africa. I have tried without success to discover a description of it somewhere.—(G. H.) Not very common at Bembe, and, I believe, unknown on the coast. Shot in a wooded ravine near a rivulet. Called "*Engumbeashedioco*."—(J. J. M.)

12. *TCHITREA MELAMPYRA*, Verr.

Common in the wooded ravines near Bembe; native name "*Engundobeoli anfinda*;" recognizable by its peculiar cry, but difficult to see, keeping in the densest thickets.—(J. J. M.)

13. *DRYOSOPUS ANGOLENSIS*, Hartlaub, n. sp. *Supra obscure cinereus, uropygio pallidiore; remigibus fuscis, cinerascete marginatis; pileo toto, nucha colloque postico nigerrimis, nitore nonnullo chalybeo, plumulis pilei sericeis, brevissimis; reetricibus obsolete fusciscentibus, mediis potius cinerascens, scapis supra nigris, subtus albis; subtus pallide cinerascens, gutture et subalaribus albis; rostro nigro, pedibus fuscis; iride obscure cærulea.*

Long. circa  $7\frac{3}{4}$ " , rostr. a fr.  $8\frac{1}{2}$ " , alæ  $3'' 2'''$  , caud. a bas.  $3''$  , tars.  $9\frac{1}{2}'''$  .

Decidedly new, and *not quite typical*. The characteristic development of the rump-feathers, so conspicuous in all the typical *Dryoscopi*, is very little apparent in this new one, and the structure of the curiously short and silk-like feathers of the crown is also very peculiar. Beak strongly carinated.—(G. H.) Common near Bembe in the thick wood. Stomach very large, and full of Indian corn and seeds. Native name "*Entuecula*."—(J. J. M.)

14. *EUPLECTES FLAMMICEPS*, Sw.

Angola is certainly the most southern locality of this species on the west coast. Its northern frontier seems to be the Gambia. Von Pelzeln writes me that there is a specimen at Vienna obtained by Bojer on the island of Zanzibar.—(G. H.) Very common at Bembe, but not seen on the coast; found among the high grass.—(J. J. M.)

15. *SPERMESTES POËNSIS*, Fras.

Seen in flocks in the high grass at Bembe.—(J. J. M.)

16. *PYTELIA MONTEIRI*, n. sp. (Pl. CLXI.) *Supra cinerea, dorso distincte olivascete; uropygio et supra-caudalibus obscure coccineis, maculis nonnullis albis, rotundatis; alis et cauda brunneo-cinerascens; macula gulari longitudinali intense cinnabarina; pectore et abdomine dilute et late cinnamomeis, maculis rotundatis albis pulchre et confertim notatis; subalaribus pallidius rufo alboque variis; subcaudalibus brunneo alboque late et conspicue fasciatis; rostro nigricante; pedibus rubellis.*

Long.  $4\frac{1}{4}$ " , rostr. a fr.  $5''$  , alæ  $2'' 2'''$  , caudæ  $1\frac{1}{2}''$  , tars.  $6'''$  .

This beautiful little Finch is the pride of Mr. Monteiro's collection.

It is undoubtedly new, and I take great pleasure in naming it after its discoverer. May he add many more interesting novelties to our knowledge of African ornithology!—(G. H.) Only one specimen was obtained of this Finch. It was brought to me alive, having been trapped by a native near Bembe. Said to be found in flocks, like *Spermestes poënsis*.—(J. J. M.)

17. *LAMPROCOLIUS SPLENDIDUS* (Vieill.).

Tolerably common at Bembe, and more so near the coast, being found in flocks of from twenty to thirty. It has a clear whistle like a Starling (*Sturnus*). There is another smaller species of this group very abundant.

18. *ZANCLOSTOMUS ÆNEUS*, Vieill.

First described by Perreïn from an Angolan specimen.—(G. H.) Found only in the interior.—(J. J. M.)

19. *CHALCITES SMARAGDINEUS*, Sw.

Brought to me alive from Encôge, two days' journey to the south of Bembe, where they are said to be abundant.—(J. J. M.)

20. *TRERON NUDIROSTRIS*, Sw.

Identical with Abyssinian specimens.—(G. H.) Very common both on the coast and in the interior. Fat and good to eat. Found generally among the branches of the *Adansonia digitata*, which is very abundant on the coast. This pigeon is called "*Encuturuga*."—(J. J. M.)

21. *PORPHYRIO ALLENI*, Thomp.

Differing from Abyssinian specimens only in the rather darker and more olive shade of the back.—(G. H.) Very abundant in the interior. I had seven alive at one time in my garden at Bembe. They are very tame in captivity. In a wild state, they haunt the rivulets and marshes, and are known as "*Ensuso en maza*," or Waterhen.—(J. J. M.)

22. *SULA CAPENSIS*, Licht.

Seen at Ambriz on the beach, where it is common, and subsequently at Loanda.—(J. J. M.)

In conclusion, I may remark that the Black-cheeked Monkey (*Cercopithecus melanogenys*) described by Dr. Gray in the Proceedings of this Society for 1849, and figured Mamm. Pl. IX. fig. 1, is very abundant at Encôge, three days' journey to the south of Bembe. About Bembe I have seen but one species, probably of the same genus, but of much larger size and of uniform colouring.—(J. J. M.)





4. NOTES ON THE HABITS OF *MENURA ALBERTI*. BY A. A. LEYCESTER, ESQ. (IN A LETTER ADDRESSED TO JOHN GOULD, ESQ., F.R.S., &C.)

The habits of this bird are very similar to those of the *Menura superba*, as described by Mr. Gould, but, as that gentleman has begged for a full description of them, I send all the particulars I have been able to collect.

The *Menura alberti* is famous for its most extraordinary mocking capabilities. It is found only on the Brisbane and Tweed rivers and in the neighbourhood of their waters. It inhabits the rushes, and generally chooses a sandy soil for its locality. I never saw more than a pair together, male and female. Each male bird has his walk or boundary, and gives battle if another male encroaches on it. He commences singing some time before the dawn of day, being the earliest of the forest-birds in this respect. His song is much varied, as besides his own peculiar note he imitates the cries of all the birds in the bush, such as the Laughing Jackass (*Dacelo gigas*), and even the mournful howl of the Owl and the thrilling scream of the Curlew. When singing and playing about he spreads his tail over his back like a peacock. He scratches and picks at the earth while singing, which he generally does until about an hour after sunrise. He then becomes silent, and remains so until about an hour before sunset, when he again commences, and continues singing and playing about until it is quite dark. This *Menura* feeds entirely upon insects, mostly small beetles, mingled with a goodly proportion of sand. It has no crop or upper stomach. The male bird is about four years old before he gets his full tail, as I have proved by shooting examples in full feather with the tail in four different stages of development; the two centre curved feathers are the last to make their appearance. It breeds in winter, commencing its nest in May, laying in June, and hatching its young in July. It generally builds on some bare rock where there is a sufficient shelter for a lodgment, so that no animals or vermin can approach. The nest is constructed of small sticks interwoven with long dry roots and moss, the inside being composed of the skeleton leaf of the parasitical tree-fern, which makes an inside lining, and is very similar to horse-hair. It is completely rain-proof, and has an entrance at the side. The hen lays only one egg of a very dull colour, looking as if it had been blotched over with ink. The young bird when first hatched is covered with a white down, and remains in the nest about six weeks before it takes its departure. The flesh is not good for food, being of a dark colour, tough and dry. The aboriginal name is *Colwin*.

5. ON THE REPTILES OF SIAM. BY DR. ALBERT GÜNTHER.  
(Reptilia, Pl. XXIII.)

There is no part of Tropical Asia of which the Amphibio-fauna is so little known as that of Siam. The only information on the No. 424.—PROCEEDINGS OF THE ZOOLOGICAL SOCIETY.

subject must be gathered from some old works, and this is scanty enough, as we shall see hereafter. And yet, what has been considered down to the present day the scarcest and most remarkable species of Snake—*Herpeton tentaculatum*—proves now to be an inhabitant of this very country. A collection of reptiles, transmitted last year by M. Mouhot to the British Museum, contains two specimens of this Reptile, beautifully preserved in every respect, and also twenty-two other species. We thus gain a first step to a fuller knowledge of Siamese Herpetology. I proceed to give an account of this collection.

1. *EMYS SIAMENSIS*, Gray.
2. *CALOTES VERSICOLOR*, Daud.
3. *GECKO VERUS*, Merr.
4. *TILQUA RUFESCENS*, Shaw.

This species varies very much: the posterior frontals form a more or less broad suture together in some of the specimens, whilst in others they are entirely separated from each other by the intervening medial shield. The black lateral streak is most conspicuous in individuals of middle age, and is gradually lost in older ones; it disappears entirely if the epidermis is stripped off. Young individuals are uniform blackish-ash, minutely speckled with whitish.

5. *XENOPELTIS UNICOLOR*, Reinw.
6. *TYPHLOPS DIARDII*.
7. *CALAMARIA QUADRIMACULATA*, Dum. et Bibr.
8. *SIMOTES TRINOTATUS*, Dum. et Bibr., var.

Duméril states correctly the number of longitudinal series of scales, which is twenty-one. The Siamese specimen, however, differs in the coloration, having the belly pure white, the back reddish-olive, some scales being blackish, and forming transverse streaks in regular interspaces, but not three distinct series of spots.

9. *TROPIDONOTUS QUINCUNCIATUS*, Schleg. var. F., Gthr.
10. *HYPsirrhina ær*, Wagl. Variety without series of spots on the belly or tail.
11. *HERPETON TENTACULATUM*, Lacép. (Pl. XXIII.)

This Snake is hitherto known from a single discoloured specimen only, which has served for all the descriptions published. After the account and the figure given by Schlegel, it does not appear necessary to repeat a description of the form, or of the shields and scales, in which our specimens do not show any difference. The larger of



the specimens is an adult male, 25 inches long, the smaller half-grown, 13 inches long. The coloration and the dentition are as follows:—

The ground-colour of the broad back is brown or olive-brown, bordered on each side by a black line, which becomes indistinct posteriorly, and is more conspicuous in the young specimen; those black lines are separated from each other by five or six series of scales, and show button-like swellings in regular interspaces; black transverse lines run obliquely from one line to the other, most conspicuous on the anterior part of the trunk, whilst they appear in the form of specks towards the middle of the length, entirely disappearing posteriorly. A blackish-brown band proceeds from the tentacle through the upper half of the eye along the side of the body to the end of the tail; it occupies two to three series of scales, and is separated from another similar band, running along the lower part of the side, by a brownish-yellow band-like interspace. The lower of the blackish bands is confluent with the upper on the side of the vent. The lower parts are brownish-yellow, with a pair of darker longitudinal streaks, flanking the abdominal shields. There is a series of white or faint rose-coloured, posteriorly black-edged, spots on each side between the ventral and the lower lateral band; they form very distinct and elegant markings in the younger specimen, where they are continued to the vent, forming altogether twenty-four pairs; some of them are opposite to those of the other side, others alternate with them. These spots are less bright in the old specimen, and distinct only on the anterior part of the belly. The lower lip has a yellowish margin, and there are two wavy yellow lines along the throat.

Duméril made a mistake in suggesting that *Herpeton* has a long and grooved posterior maxillary tooth, like the snakes of his family of "*Platyrrhiniens*." All the teeth are of equal length, and not one is grooved. They are of moderate strength and somewhat closely set, and there are ten in the upper, and as many in the lower jaw. The series of the palatine and pterygoid bones is formed of fifteen or sixteen. Another very remarkable peculiarity is found in the structure of the intestines, which in the posterior third of the length of the trunk form a big mass of twelve or thirteen convolutions. Having found the same in *Acrochordus javanicus*, I do not hesitate to remove *Herpeton* from *Homalopsis* and the genera allied to it (which have the usual simple intestinal tractus), and to place it beside *Acrochordus*. *Hornstedt* has found undigested fruits in the stomach of the latter.

12. *SPILOTES RADIATUS*, Reinw.

13. *CORYPHODON BLUMENBACHII*, Merr. The keels of the scales are not distinct in very young individuals.

14. *CORYPHODON KORROS*, Reinw.

15. *CHRYSOPELEA ORNATA*, Shaw, var.  $\beta$ , Gthr.

16. *TRIMESURUS ALBOLABRIS*, Gray.

17. OXYGLOSSUS LIMA, Tschudi.
18. RANA VITTIGERA, Wiegman.
19. BUFO MELANOSTICTUS, Schneid.
20. POLYPEDATES MACULATUS, Gray.
21. HYLARANA ERYTHREA, Schleg.
22. KALOULA PULCHRA, Gray.
23. PLETHODON PERSIMILIS, Gray.

The earliest notice of Siamese Reptiles is found in *Tavernier* ('Collection of Travels through Turkey into Persia and the East Indies,' Lond. 1684, fol.). In Part 2, book iii. chap. xviii., speaking of the kingdom of Siam, he says, p. 189, "There are some serpents, two foot long, with two heads; but one of them has no motion. There is also another creature, like our Salamander, with a forked tail, and very venomous."

We learn more from the Jesuit *Tachard*, who published a 'Voyage de Siam des pères Jésuites,' Amsterd. 1689, 8vo. He mentions, p. 155, *Gecko verus* with the name of *Toquet*, and describes the species as "Lézards fort vénimeux, trouvés dans les maisons de la ville de Siam" (Juthia). In his other work, 'Second voyage du père Tachard et des Jésuites envoyés par le roy au royaume de Siam,' Paris, 1689, 4to, he gives a figure of the same species, and describes its anatomy, p. 276.

*P. Goÿe* ('Observations physiques et mathématiques, envoyées de Siam à l'Académie royale par les pères Jésuites,' etc., Paris, 1688, 8vo.) knows two Siamese reptiles: the one (p. 47, pl. 3) is again *Gecko verus*: "Le toc-kaie est deux fois plus gros que les lézards verts qu'on voit en France," etc. "En criant il articule très distinctement les deux syllabes toc-kaie." The other is a Crocodile (p. 2, pl. 1, 2) "trouvée dans la fleuve Menam, qui baigne le pied des remparts de Louvo; nom. *Ta-kaie*." Cuvier (Ann. Mus. x. p. 51. pl. 1, f. 9) has established *Crocodilus galeatus*, from Goÿe's account, and a skull sent by the Jesuits to Paris. Nothing else is known of this species.

*Kämpfer*, who had visited Siam in 1690, mentions in his 'Geschichte und Beschreibung von Japan,' Lemgo, 1777, 4to. p. 24, venomous water-snakes in the river of Juthia, making their appearance every seventh or tenth year, at the end of the month of May. Several people, bitten by the snakes, died, and every body was prohibited, by a royal order, to bathe or to wash in the river. The snakes are said to be not longer than a finger, and not bigger than a leech, brown- or blue-coloured. This story of small venomous freshwater-snakes is not less doubtful than that of the big Sea-serpent.

*Crawford* ('Journal of an Embassy to the Courts of Siam and

Cochinchina,' Lond. 1828, 4to.) observes, pp. 434, 435, that Tortoises and Crocodiles are not so frequent in the Menam as in the Ganges, that Lizards and Snakes are very numerous: "some were obtained even in the court-yard of our dwelling; among those we found no poisonous ones. The Hooded-snake, *Coluber naja*, is known to exist; also a *Python* 12-13 feet long."

From notices made by Sir J. Bowring in 'The Kingdom and People of Siam,' Lond. 1857, 8vo., vol. i., it is evident that there is yet a wide field for the Herpetologist in Siam. P. 228, "The reptiles of Siam are multitudinous; Crocodiles live in the rivers from their mouths to their shallows." P. 230, "There are many species of lizards; the largest is the *Tackuet*, the tongue of which is divided in two; the noisy *Tookay*, destroying vermin; *Chamæleons*, *Flying-lizards*; Serpents from the most gigantic to the smallest species." P. 231, "a snake called 'Sun-beam' from its very brilliant colours, inert, the bite of which is said to be mortal; an immense frog sings, especially during rain."

We see from the notes quoted that we can add to the above list some other reptiles: those specifically determined are *Naja tripudians* and *Crocodilus galeatus*, those generically, *Chamæleo* and *Draco*, the Tortoises being mentioned in too general terms to admit of any further suggestion.

## 6. DESCRIPTION OF NEW SPECIES OF THE GENERA DOSINIA AND CYCLINA FROM THE COLLECTION OF H. CUMING, ESQ. BY DR. E. RÖMER OF CASSEL.

1. *DOSINIA ERYTHRAEA*, Römer. *D. testa subquadrato-orbiculari solidiuscula, medio tumidiuscula, postice compressa et peculiariter inflexa, inæquilaterali; liris crassiusculis, elevatis, sub-irregularibus, sæpe furcatis, postice confluentibus et valde sursum flexis, his scabris sensim extenuatis circumcincta; albida, vel sordide alba, maculis sanguineis lividisve, præcipue ad umbones, infecta, interdum radiis pallide rubris in extremitate postica ornata; umbonibus vix prominentibus, valde incurvatis, paulo retroversis, tenuissime striatis, ferrugineis, in  $\frac{1}{3}$  longitudinis positis; margine ventrali medio dependente, anticè exacte curvato, postice subito oblique ascendente; margine dorsali antico brevi, concavo, postice subdeclivi et longe curvato, vix in alæ formam surrecto; lunula profundissima, cordata, linea argutissime circumscripta, longitudinaliter sublamellosa, fusco maculata; area anguste lanceolata, labiis valde elevatis, hiantibus; ligamento profunde immerso; intus flavescente; sinu palliari magno, triangulari, ab initio modice lato, superne multo deminuto, in apice angustissimo, rotundato; lamina cardinali latissima, dentibus cardinalibus crassis, ultimo in valva sinistra pertenui, dente lunulari valido, papilliformi.*

Long. 51, alt. 50, crass. 26 mill.

*Hab.* Mare Rubrum (Hemprich et Ehrenberg), Aden (Cuming).

This is the second example I have seen of this interesting species. A year since, I named, but did not publish it, after a smaller shell than the above in the Royal Museum at Berlin. This species is referable to the same section as *D. exoleta*, and is most allied to *D. amphidesmoides* of Reeve; but it is very distinct in its form and sculpture, in its area, which is more impressed than in any related species, and particularly in its produced small triangular pallial sinus, which is rounded at the apex. The concentric striæ are elevated and rounded in the middle of the shell, and diminish very much near the extremities; in the posterior part there is a peculiar compression of the valves, at the place where the striæ converge, whilst the latter suddenly turn upwards and become thinner by degrees.

2. *DOSINIA TENELLA*, Römer. *D. testa subquadrato-orbiculata, vix longiore quam alta, tenui, translucida, compressiuscula, inæquilaterali; lineis transversis densis, regularibus, postice vix convergentibus, et vix elevatioribus, superficie proinde serico simili nitente; pallide ferrugineo-alba, umbonibus saturatioribus, mediocriter prominulis, acutiusculis, recurvis, longitudinem in ratione 1:2 dividens; margine ventrali semicirculari, ante et pone æqualiter et valde ascendente; margine dorsali antico perbrevis, subrecto, obliquo, infra rotundatim prosiliente, postico declivi, producto, in marginem ventralem cum angulo rotundato transiente; lunula lanceolato-cordata, impressa, circumscripta, medio elevata; area subplana, angusta, ligamento subimmerso, sub labiis hiantibus conspicuo; intus albida, medio opaca; sinu palliari magno, triangulari, lineis includentibus rectis, in apice rotundato; lamina cardinali tenui, angusta; dente cardinali antico in valva sinistra tenui, obliquo, cum secundo, crassissimo complicato, dente lunulari mediocri, compresso.*

Long. 22, alt. 20·5, crass. 10·5 mill.

*Hab.* Australia.

In general appearance this small shell reminds one of *D. subrosea* Gray; the shape is nearly the same, but the angle of the posterior end is more rounded than in that species, and the posterior slope more descending. The forms of the area and lunula are very different from those in *D. subrosea*, being not so much impressed, and the latter, which in *D. subrosea* is exactly heart-shaped, is in *D. tenella* more lanceolate. The concentric striæ are so thin and regular as to produce an aspect like silk, whilst the striæ in *D. subrosea* are flat and much broader. Besides the more solid growth of the latter, a most remarkable difference exists in the form of the *pallial sinus*, which in *D. subrosea* is broad and acute at the apex, while in *D. tenella* it is large and rounded at the top. In the latter the plate of the hinge is very small and thin.

3. *DOSINIA AMETHYSTINA*, Römer. *D. testa quadrato-rotundata, solida, compressiuscula, postice valde compressa, satis inæquilaterali; transversim lirata, liris æqualibus, distantibus, filiformibus, extremitates versus confluentibus, striisque transversis*

*minoribus cincta; interstitiis longitudinaliter dense et undulatum striatis; violacescenti-albida, ad umbonum regionem amethystina; umbonibus acutis, subprominentibus, valde antrorsum inclinatis, in  $\frac{1}{4}$  longitudinis collocatis; margine ventrali medio subcurvato, postice subito subrecte, et antice subcurvatim, in utroque latere valde adscendente; margine dorsali antico brevissimo, concavo, postico subhorizontali, vix curvato, infra angulo obtuso formante; lunula ovali, lateraliter compressa, medio acute elevata, lamellis curvatis oblecta, alba, linea argutissima circumscripta; area lanceolata, ad basin lineis impressissimis constricta, medio in alæ formam surrecta, lamellosa, area secunda lineari, ligamento immerso, sub labiis hiantibus conspicuo; intus amethystina, disco et impressionibus muscularibus pallidioribus; sinu palliari magno, triangulari, apice late rotundato; dente laterali crassissimo, papilliformi.*

Long. 30, alt. 28, crass. 14 mill.

*Hab.* Australia.

A very peculiar shell, differing from all its congeners. The outline is that of *D. pubescens*, Phil. (*cælata?* Reeve), and the wing-like elevation of the ligament-area is also similarly formed; but in other respects there exists no relation between these species. The amethystine colour is dark near the umbones; towards the basal margin it becomes lighter, and changes at last into a pale bluish white. The concentric striæ are small and thread-like, moderately elevated, running almost equidistant from each other, and converging at the sides. The greatest peculiarity consists in the close undulated striæ going from the apex to the base, but only in the interstices, which are thrice as broad as the concentric elevated lines. The white wing-like ligament-area and the white lunula, laterally compressed, and therefore shaped like the former, and both elevated on an amethystine ground, produce a very agreeable aspect. It is a characteristic sign of *Dosinia* that the lateral tooth of the hinge is very small, shaped like a wart, and very near the cardinal-teeth; in this example the lateral tooth is as large and broad as in any known species.

4. *DOSINIA OVALIS*, Römer. *D. testa rotundato-ovali, solida, tumidiuscula, posterius obtusissime angulata, valde inæquilaterali, liris transversis densis, sublatis, rotundatis, ad latera, præcipue postice, subundulatis, vix elevatioribus cincta; pallidissime ferrugineo-alba; umbonibus acutis, vix prominulis, mediocriter reflexis, in  $\frac{1}{2}$  longitudinis positis; margine dorsali postico prælongo, arcuato, declivi, antico concavo, brevi, margine ventrali fere semicirculari, in utraque extremitate rotundatim et æqualiter adscendente; lunula cordata, convexiuscula, maxime impressa, argutissime circumscripta, longitudinaliter striata; area lanceolata, concaviuscula, striata, ligamento subimmerso, conspicuo; pagina interna ferrugineo-alba, fere omnino opaca; sinu palliari magno, angustissime triangulari, valde adscendente, apice obtusiusculo, lineis subrectis incluso; dente lunulari crasso, lateraliter com-*

*presso, cardinalibus valde accesso; dente cardinali secundo in valva sinistra latissimo, cuneiformi, sensim assurgente.*

Long. 57, alt. 53, crass. 26 mill.

*Hab.* —?

The *Dosinia scalaris*, Menke, is a very peculiar shell, and has affinities with three species, by which it is connected with other groups, at the first sight remote from it. One of these species is *D. deshayesii* of A. Adams; the second, from the Royal Museum at Stuttgart, named by me *D. affinis*; the third is the above. The shape of this last is nearly the same as that of *D. scalaris*, but the sculpture is very different, consisting in *D. ovalis* of close-set rounded and not elevated striæ, which at the sides do not change into lamellæ. The greatest difference is expressed by the size and form of the *pallial sinus*, which in *D. scalaris* is very broad and moderately deep, inclosed by concave lines, and with a large rounded apex, whilst in *D. ovalis* it is very small and long, and considerably ascending. In the former, the second cardinal-tooth of the left valve is broad and thick; in the latter it is wedge-shaped, and increases by degrees from the base to the very sharp and linear top. Accordingly, the last tooth in the right valve is very remote from the second, and both of them are separated by a broad triangular cavity.

5. *DOSINIA EBURNEA*, Römer. *D. testa cordato-orbiculari, tumida, diaphana, postice distincte angulata, antice rotundata, valde inæquilaterali; liris transversis, medio latis, planis, densis, extremitates versus numero valde decreescentibus et in lamellis tenuibus, sparsis, dorsum reflexis, postice elevatioribus, mutatis; eburnea, nitidissima, zonis transversalibus pallidissime luteis ornata; umbonibus tumidis, valde recurvis, longitudinem in ratione 1 : 3 discludentibus; margine ventrali regulariter arcuato, antice eximie adscendente, dorsali antico perbrevis, concavo, postico producto, curvato, oblique descendente; lunula late cordata, impressissima, subplana; area lanceolata, subexcisa, sublevigata, lamellis brevibus, raris, e liris transversis excurrentibus, cincta; ligamento subimmerso, conspicuo; intus eburnea, nitida, disco opaco; sinu palliari mediocri, lingulato, in apice late rotundato, linea superiore horizontali; dente lunulari crassissimo, dentibus cardinalibus tenuibus.*

Long. 37, alt. 34, crass. 20 mill.

*Hab.* Insula Ceylon.

In the middle of the shell the transverse striæ are formed as in *D. dunkeri*, Phil.; they therefore produce the same shining aspect and interference of light, consisting in alternately bright and dark longitudinal traces. Near the posterior end these striæ grow smaller and more elevated, till at last the second or third of them remains in the form of a thin and bent-down lamella; near the anterior extremity the same thing is to be seen, but the lamellæ are less produced. The pallial sinus is tongue-shaped, and its upper line runs in a horizontal direction. The valves are tolerably solid, but transparent, and the teeth of the hinge are very thin, except the lateral

one, which is uncommonly thick and elevated. This very fine species is distinguished by many peculiarities from all others I am acquainted with.

6. *DOSINIA SPECULARIS*, Römer. *D. testa subcordato-orbiculari, vix altiore quam longa, postice obtuse angulata, tumida, solida, valde inæquilaterali; concentricè tenui-striata, striis planis, densis, ad latera furcatis, elevatioribus et in lamellis brevibus, præcipue postice terminatis; strigillis longitudinalibus interruptis, irregularibus, extremitates versus evanescentibus; sordide alba; umbonibus pallide luteis, valde prominulis, recurvisque, in  $\frac{1}{4}$  longitudinis collocatis; margine ventrali semicirculari, antice et postice valde ascendente; dorsali antico perbrevis, concavo, postico maxime declivi, longe curvatim descendente; lunula late cordata, impressa, plana, circumscripta; area lanceolata, profunde excavata, longitudinaliter strigillata, marginibus acutis, lamellis brevibus limitatis; ligamento immerso, vix conspicuo; pagina interna alba; sinu palliari mediocri, triangulari, apice acuto, lineis subrectis incluso, linea superiore horizontali; dente laterali incrassato, secundo cardinali in valva sinistra crassissimo, irregulariter plicato, reliquis tenuibus.*

Long. 28, alt. 29, crass. 16 mill.

*Hab.* Malacca.

In general appearance like *D. adansonii* of Philippi (which is neither *Le Dosin* of Adanson, nor *D. africana* of Gray), but a thicker and more oblique shell, having the concentric striæ lamellar at the sides, whilst in *D. adansonii* they are uniformly flat; the ligament-area is more excavated in *D. specularis* than in the latter, and the pallial sinus is shorter and forms an acute angle, being in *D. adansonii* rounded in the apex. The scar of the posterior muscle is uncommonly small and nearly circular.

7. *DOSINIA RUSTICA*, Römer. *D. testa ovato-orbiculari, longiore quam alta, postice distincte angulata, tumidiuscula, valde inæquilaterali; liris transversalibus, subdensis, inæqualibus, elevatis, sublamellosis, antice posticeque in lamellis tenuibus mutatis, scabra; sordide alba; umbonibus tumidiusculis, subprominulis, satis antrorsum recurvatis, in  $\frac{2}{7}$  longitudinis positis; margine ventrali semicirculari, postice vix producto, antice rotundato et valde ascendente; margine dorsali antico brevi, concavo, postico valde declivi, curvatim longe descendente; lunula cordata, impressa, circumscripta, subplana, longitudinaliter striata; area late lanceolata, subexcavata, strigillata; ligamento immerso, vix conspicuo; intus albida, medio ferrugineo maculata; sinu palliari mediocri, triangulari, haud aperto, apice obtusiusculo, lineis subconcavis incluso, superiore fere horizontali; dente laterali crasso, papilliformi.*

Long. 28, alt. 26, crass. 14 mill.

*Hab.* — ?

The outline is that of *D. aspera*, Reeve, which is a smaller shell

and has a very different sculpture and pallial sinus. The concentric striæ are a little broader than the interstices, elevated, but of an unequal height, not diminishing much towards the sides, and there becoming lamellar. The pallial sinus is not widely open, is extended to the middle of the shell, and included by lines which are a little concave and form a small round vertex. The latter is marked with a pale rust-coloured stain, which is produced upwards, and disappears by degrees.

8. *DOSINIA SALEBROSA*, Römer. *D. testa oblique quadrangulâri rotundata, vix altiore quam longa, antice posticeque obtuse et rotundatim truncata et biangulata, tumida, valde inæquilaterali; lamellis transversis, densis, tenuibus, irregularibus, ad extremitates in foliis sparsis, erectis conversis; calcarea, opaca; umbonibus tumidiusculis, prominentibus, recurvis, in  $\frac{1}{4}$  longitudinis sitis; margine ventrali postice dependente, medio subcurvato, antice fere perpendiculariter, postice oblique ascendente; margine dorsali antico brevi, vix concavo, postico valde descendente, longe curvato; lunula triangulari-cordata, impressa, circumscripta, longitudinaliter striata, foliis brevissimis circumdata; area anguste lanceolata, valde excavata, foliis parvis cincta; ligamento valde immerso, vix conspicuo; intus alba; sinu palliari mediocri, late aperto, in apice rotundato, lineis includentibus subrectis, superiore subhorizontali; dente laterali mediocri, papilliformi, secundo cardinali in valva sinistra crasso, tertio in dextra lato, producto, profunde inciso.*

Long. 22·5, alt. 23·5, crass. 13 mill.

*Hab.* Malacca.

In the outline this shell much resembles *D. lucinoides* of Reeve, but by the sculpture and size can be readily distinguished from it. In consequence of the straightness of the basal margin, and the rounded truncation of the sides, there are produced four obtuse angles on the margins, whilst the posterior part of the basal margin projects a little downwards. All the surface is covered with fine, close-set, slightly elevated lamellæ, running irregularly and growing elevated and leaf-like at the sides, particularly on the hinder part, so as to terminate the ligament-area with a wreath of short leaf-work. The pallial sinus is distinguished by its wide opening, and by its broadly rounded apex. The exterior of this shell is calcareous, without any lustre.

9. *DOSINIA TRIPLA*, Römer. *D. testa rotundato-triangulâri, subinæquilaterali, inflata, tenui, vix longiore quam alta; striis transversalibus, subrotundatis, vix elevatis, interstitiis æquantibus, subregularibus, ad latera tenuibus, non elevatioribus cincta; albida; umbonibus acutiusculis, maxime prominulis, incurvis, in  $\frac{2}{5}$  longitudinis positis; margine ventrali subcurvato, ad latera vix ascendente; margine dorsali antice oblique et subrecte descendente, postice obliquo, subcurvato, in utroque latere fere usque ad basin producto; lunula maxima, totam declivitatem anticam occupante,*



*late lanceolata, superficialia, medio elevata, e striarum transversarum processu crebro striata, linea subelevata circumdata; area lanceolata, subincisa, obtuse limitata; ligamento immerso, sub labiis late hiantibus conspicuo; pagina interna alba, medio pallide luteo infecta; sinu palliari magno, sublato aperto, apice acuto, lineis subconcavis incluso; impressione musculari antica angusta, usque ad laminam cardinalem producta, postica latissime pyri-formi; lamina cardinali angusta, tenui; dente lunulari elevato, acutiusculo, valde remoto, dentibus cardinalibus tenuibus, secundo in valva dextra crasso, tertio permagno, perobliquo, bisulcato.*

Long. 37, alt. 35, crass. 20 mill.

*Hab.* Malacca.

This fine species belongs to the section represented by *D. excisa* of Chemnitz and *D. trigona* of Reeve; it differs from both not only in its thinner shell, the transverse striæ of which are much finer, but still more in the following particulars. In *D. excisa*, the umbones are situated at  $\frac{2}{7}$ , in *D. trigona* at  $\frac{1}{2}$ , and in *D. tripla* at  $\frac{2}{5}$  of the whole length, so as to produce nearly the aspect of an isosceles triangle; the ligament-area is very deeply excavated in the first, very narrowly lanceolate and but a little hollowed in the second, deeper and less narrowly lanceolate, but with rounded limits, in the third; the lunula is flat in *D. excisa* and *trigona*, being in the latter much broader than in the former, whilst it is swollen and convex in the middle, and more lanceolate in *D. tripla*. The pallial sinus is broad and roundly triangular in both the former species, but less opened and acute at the apex in the latter, which has also a very thin and small hinge-plate.

10. *DOSINIA DERUPTA*, Römer. *D. testa rotundato-triangulari, subinaequilaterali, tumidiuscula, tenuicula, vix latiore quam alta; liris transversalibus regularibus, rotundatis, elevatis, interstitiis aquantibus, postice valde confluentibus cincta, interstitiis lirisque tenuissime transversim striatis; pallide luteo-alba; umbonibus marginibus, lunulaque ut in D. tripla; area angustissime lanceolata, subexcisa, exacte ut in D. trigona; intus alba; sinu palliari latissime aperto, magno, apice acuto, lineis concavis incluso; lamina cardinali angusta, subtenui; cardine ut in D. tripla, sed dente cardinali medio in valva sinistra crassiore, tertio in dextra obsolete bisulcato.*

Long. 26, alt. 24, crass. 15 mill.

*Hab.* Malacca.

This species is nearly related to *D. trigona*; the outline is almost the same, the extremities being only a little more rounded. But the concentric striæ, notwithstanding the smaller size of the shell, are far thicker, as broad as the interstices, and, both being finely striated, produce the effect of smaller transverse striæ. The ligament-area is formed exactly as in *D. trigona*. The pallial sinus is broadly open with an acute apex, the upper line being horizontally directed. From this it may be seen that *D. derupta* unites several of the characters of *D. trigona* and *D. tripla*; but the size, the sculpture, the pallial

impression, and the hinge, prove it to be different from each of those species.

11. *CYCLINA SPLENDIDA*, Römer. *C. testa subquadrato-orbiculari, lentiformi, vix altiore quam longa, tumida, subinæquilaterali; concentricæ grosse lirata, liris in parte inferiore remotis, rotundatis, in medio subregularibus, extremitates versus irregulariter confluentibus, bifurcatisque, postice tumidioribus, liris ad umbonum regionem sensim densioribus, denique tenuissimis; interstitiis transversim striatis; nitida, pallide crocea, marginibus albidis; umbonibus tumidis, valde prominulis, incurvis, fere contiguis, in  $\frac{2}{5}$  longitudinis collocatis; margine ventrali medio dependente, subrotundato, tum in utroque latere oblique et subrecte adscendente; margine dorsali regulariter curvato, postice valde prosiliente et in utraque extremitate cum margine ventrali angulum vix distinctum, rotundatum formante; lunula areaque nullis, ligamento occulto, longe conspicuo; pagina interna luteo-alba, ad marginem pallidissime albido-cærulescente; sinu palliari magno, late triangulari, valde sursum directo, in apice rotundatim biangulato, lineis subrectis incluso; lamina cardinali lata, planissima, dentibus in valva sinistra fere æqualiter configuratis, tertio in valva dextra crassissimo, subprofunde bisulcato; margine interiore subdense denticulato.*

Long. 46, alt. 48, crass. 27·5 mill.

*Hab.* Japan.

The characters of this pretty shell bear a strong resemblance to those of *C. flavida* of Deshayes, and it was after much hesitation that I decided to separate it as species. I find it differing, in its more quadrangular outline, in its more oblique shape, the umbones being a little nearer to the anterior extremity, in the absence of the longitudinal lines, which are present at the hinder part of *C. flavida*, in the broader sinus of the pallial impression which is biangulated at the apex, and in the character of the hinge, viz. the teeth in the left valve being all of similar strength, and the third tooth in the right valve very much elevated, produced, and deeply divided.

12. *CYCLINA BOMBYCINA*, Römer. *C. testa fere exacte orbiculari, solidiuscula, antice rotundatim productiuscula, lentiformi, modice tumida, subæquilaterali; concentricæ dense lirata, liris rotundatis, ad apices tenuissimis, basin versus sensim vix crassioribus, medio regularibus, ad extremitatem posticam rudibus, irregulariter confluentibus, lineis longitudinalibus impressis, cærulescentibus, per liras concentricas interruptis, medio exilissimis, densissimis, ad latera, præcipue postice, remotioribus, expressioribus ornata; colore e zonis pallide cærulescentibus et flavicantibus mixto, superficie serico simili nitente; umbonibus acutiusculis, subrecte elevatis, incurvatis, contiguisque, vix medianis; lunula areaque nullis; ligamento immerso, conspicuo; pagina interna albida, medio flavicante, supra pallide cærulea, ad marginem ianthina; sinu palliari mediocri, sublato aperto, in apice anguste rotundato, lineis inclu-*

*dentibus subundulatis; dentibus cardinalibus anticis in valva sinistra superficialiter bisulcatis, tertio pertenui, dente medio in valva dextra cuneato, e lumellis duabus complicatis composito, tertio curvato, profunde diviso; margine interno dense et fortiter dentato.*

Long. 38, alt. 37·5, crass. 21 mill.

*Hab.* Japan.

Var. *Testa tumidiore, zonis flavidis prævalentibus, liris transversis infra remotioribus, lineis longitudinalibus medio obsoletis.*

*Hab.* China.

This species is easily known by its being nearly equilateral and well-rounded, and by the fine impressed lines running from the apex to the base, which are scarcely visible in the middle, but grow stronger at the sides, particularly at the hinder part of the shell, where they show a pale cerulean colour. The regular and close-set transverse striæ produce a kind of silky appearance, which, in connexion with the pale bluish and yellowish bands, gives the shell a very agreeable aspect. There are peculiarities of the pallial sinus and of the hinge which also distinguish this species from all its congeners.

13. *CYCLINA PECTUNCULUS*, Römer. *C. testa orbiculari, vix altiore quam longa, antice rotundatim productiore, ad marginem basalem posticum vix dependente, lentiformi, valde tumida, solidiuscula, attamen diaphana, modice inæquilaterali; umbonum regione transversim tenuissime striata, striis marginem ventralem versus crassioribus, et infra in liris rotundatis, irregularibus, mutatis; albida, irregulariter ferrugineo maculata et punctata, superficie subnitente; umbonibus tumidis, valde prominulis, oblique incurvis, contiguis, in  $\frac{2}{3}$  longitudinis collocatis; area lunulaque nullis, ligamento late conspicuo; intus lactea, nitida; sinu palliari mediocri, sublate aperto, apice expanso, subrotundato, lineis subrectis incluso; lamina cardinali lata, dentibus cardinalibus validis, medio in valva dextra cuneiformi, subacuto, tertio crasso, oblique producto superficialiter bisulcato; margine interno dense denticulato.*

Long. 39, alt. 40, crass. 26 mill.

*Hab.* China.

Among the little varied forms presented by the genus *Cyclina*, the species described is remarkable for the elevation of its umbones and the produced dependent hinder part of its basal margin. It is therefore not unlike in shape to a *Pectunculus*, and I know only one species in my own collection, and named by me *Cyclina intumescens*, with which it can be compared. Near the umbones the surface is covered with very fine transverse lines, which become stronger by degrees and finally change into rude, irregular, thick-set striæ. Although the valves are tolerably solid, yet they are prettily transparent, and produce at the inner part a china-like lustre. *C. intumescens* is a thicker and more oblique shell, of a rounded quadrangular outline, presenting fine longitudinal lines.

*Note.*—In the genus *Cyclina*, there are usually placed several species with no denticulated inner margin, with thin valves, very fine transverse lines at the surface, and which seem to have always a superficial lunula circumscribed by an impressed line. These species are :—*Venus kröyeri*, Philippi, *Abbild. etc.* iii. p. 26. 78. No. 9. t. 7. f. 9; *Dosinia tenuis*, Recluz, *Journ. de Conch.* tome 3<sup>me</sup>, 1852, p. 250. t. 10. f. 1, which is decidedly no *Dosinia*; *Artemis inflata*, Sow., *Thesaur. Conch.* p. 661. No. 22. t. 171. f. 25; *Artemis tenuis*, Sow. *ibid.* No. 23. t. 141. f. 22; *Cyclina subquadrata*, Hanley, *B.M. Maz. Cat.* p. 66. No. 91 (*Artemis saccata*, Gould); *Cyclina producta*, Carpenter, *Proc. Z.S.L.* 1856, p. 161. No. 6. I think these species do not agree very well with *Cyclina*, and that it would be justifiable to separate them as a subgenus. These observations show the importance of studying the animals of both groups, between which, when examined, I am convinced there will be found to exist considerable differences.

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February 28th.

John Gould, Esq., F.R.S., V.P., in the Chair.

The following papers were read :—

1. NOTE ON THE PUNJAB SHEEP LIVING IN THE SOCIETY'S GARDENS. BY PHILIP LUTLEY SCLATER, M.A., SECRETARY TO THE SOCIETY.

(Mammalia, Pls. LXXIX., LXXX.)

In August 1854 the Society received from Brigadier-General Harsey, of the Bengal Army, and Lieut. Bartlett, a fine living pair of Wild Sheep, which had been obtained by those gentlemen in the Salt-range of the Punjab in 1853. The female has twice bred in the Gardens, in 1858 and 1859, and produced on each occasion two female kids, so that we now possess a male and five females of this animal, all in a robust state of health, and likely to continue to propagate their species.

This Sheep has hitherto been labelled Vigne's Wild Sheep (*Ovis vignii*), under the supposition that it belonged to the species described under that name by Mr. Blyth in our 'Proceedings' (1840, p. 70), and subsequently in the 'Annals and Magazine of Natural History' (vii. p. 251). My present object is to prove that we have misnamed this animal, and that it is really quite distinct from the *Shapoo* or Wild Sheep of Ladakh and Thibet, which should more properly bear the name of *Ovis vignii*.

My attention was first called to this point by my friend Captain











Speke, who, upon seeing the present animals in the Gardens, at once declared them to be very different from those which he had himself pursued and shot in the higher regions of Little Thibet. There seems to be little doubt that Mr. Blyth's original name, *Ovis vignii*, comprehends both species. He associates together under the same scientific appellation "the *Shá*" (Shapoo) "of Little Thibet," and the "*Koch* of the Sulimani range between India and Khorasan\*." His description is perhaps rather referable to the latter, being the animal which we have alive in our Gardens. Now I think that the name *Ovis vignii* should be restricted to the Tibetan animal for two reasons: first, because the Sheep discovered by Mr. Vigne in "Little Tibet, where the river breaks through the chain of the Himalayas†," and dedicated to its discoverer by Mr. Blyth, was doubtless the *Shá*poo; secondly, because the other animal, the *Koch*, or *Oorial* of the Sulimani range, has already been well described by, and received another scientific name from, Capt. Hutton; so that by this course the objectionable necessity of proposing a new name is obviated.

I now proceed to endeavour to show the differences between these two species:—



1. *Ovis vignii*. The Shapoo. (Pl. LXXIX.)

*Ovis vignii*, Blyth, P. Z. S. 1840, p. 70; Ann. N. H. vii. p. 251; Journ. As. Soc. Beng. x. p. 873 (*partim*); Horsfield, Cat. Mus. E. I. C. p. 175 (specimen A, from Strachey's collection); Gray's Cat. Ungulata in Brit. Mus. (1852) p. 172; Adams, P. Z. S. 1858, p. 526 (*partim*).—*Shá* of Little Thibet (Blyth).—*Shapoo* of the Tibetans (Speke).

*Male*.—Horns subtriangular, rather compressed laterally, rounded

\* P. Z. S. 1840, p. 70.

† P. Z. S. 1840, p. 72.

posteriorly, transversely sulcated, curving outwards and backwards from the skull, points divergent; general colour above brownish-grey, beneath paler; belly white; beard short, of stiffish brownish hairs.

*Female*.—Very similar to the male, but with the horns shorter (?).

*Hab.* Ladakh, at an alt. of 12–14,000 feet (*Speke*) (*Strachey*).

*Mus.* Brit., East India Company.

This Wild Sheep inhabits the elevated regions of Ladakh, where it has been pursued and obtained by Capt. Speke, Capt. Strachey, and others since its discovery by Vigne. There are examples in the British Museum and in the collection of the East India Company, from the latter of which the figure is taken, being the specimen procured in Ladakh by Capt. Strachey.



## 2. OVIS CYCLOCEROS. The Oorial. (Pl. LXXX.)

*Wild Sheep of Hindoo Koosh*, Capt. Hay, Journ. As. Soc. Beng. ix. p. 440.—*Ovis cycloceros*, Hutton, Calcutta Journ. N. H. ii. 1842, p. 514. pl. 19 (1842).—*Ovis vignii*, Blyth (*partim*): Adams, P. Z. S. 1858, p. 526; Horsfield, Cat. Mus. E. I. C. p. 175 (spec. B.).

*Male*.—Horns subtriangular, much compressed laterally and posteriorly, transversely sulcated; curving outwards and returning inwards towards the face, points convergent; general colour rufous-brown, face livid, side of mouth and chin white; belly, legs below the knees, and feet white; blotch on flanks, outside of legs, and strong lateral line blackish; a profuse black beard from throat to breast, intermixed with some white hairs, reaching to the level of the knees.

*Female*.—More uniform pale brown, beneath paler, belly whitish, no beard; horns quite short and straight, about 3 inches long.

*Hab.* Sulimani, range of Punjab, altitude 2000 feet, and extending into Afghanistan; Kojeh Amraun, Hindoo Koosh, and Huzarreh Hills (*Hutton*).

*Mus.* East India Company (horns).

*Vivario*, Soc. Zool. Londinensis.

The very fact of this animal inhabiting the low Salt range of the Punjab, at an altitude of 2000 feet, would indicate the probability of its distinctness from the preceding, which is not found under an elevation of 12,000. The Oorial has been well described by Major Hay, Captain Hutton, and Dr. Adams, as above referred to, and it is hardly necessary to repeat the details of its habits and manners. The differences in the horns, as well as those of its general external appearance, are sufficiently obvious, as will appear on examination of the figures, to leave no doubt as to its specific difference from the *Shapoo*. The skull and horns from Griffith's Afghanistan collection, referred to in Dr. Horsfield's 'Catalogue of Mammalia' (p. 175), belong to this species. On comparing the skull with that of the *Shapoo*, we observe a general resemblance. But it may be noted that the suborbital pits in the present species are smaller, deeper, and more rounded, the nasal bones are considerably shorter and more pointed, and the series of molar teeth (formed in each skull of three premolars and three true molars) measures only 2·85 instead of 3·20 inches in total length.

At least *two* other distinct species of Wild Sheep are found within the limits of our Indian possessions. Through the kindness of Mr. Leadbeater, Capt. Speke, Mr. F. Moore, and others, I am enabled to exhibit a tolerably complete series of the skulls, the horns of these, and those before alluded to, by which the differences of all four species are appreciable at first glance.

1. The *Ovis hodgsoni*, Blyth, P. Z. S. 1840, p. 65; *Ovis ammon* et *O. ammonoides*, Hodgk.; *Ovis argali*, ex Mont. Himalay., J. E. Gray, the Ammon or Argali of the higher Himalayan ranges, the *Banbhera* of Nepal, and *N'yan* of Thibet. It is, I believe, not yet quite certain that this magnificent Sheep is identical with the *Ovis ammon*, Linn. (*Ægoceros argali*, Pallas), of Siberia. Mr. Blyth's appellation appears to be the first given to the Himalayan animal. Two fine males and a female of this species are in the Museum of the East India Company.

*Hab.* Cachar region of Nepal (*Hodgs.*); Ladakh (*Speke*).

2. *Ovis nahoor*, Hodgson (*O. burrhel*, Blyth?); the *Burrhel* or *Bhārāl* of English sportsmen; *Nahoor* of Nepal.

I confess I am not able at present to appreciate thoroughly the differences between the *O. nahoor* and *O. burrhel* as insisted on by Mr. Blyth\*. There are not sufficient specimens of the whole animal at present accessible to enable one to express a decided opinion on

\* P. Z. S. 1840, pp. 66, 67.

the subject. But, comparing the horns of *O. nahoor* in the British Museum, sent by Mr. Hodgson from Nepal, with those of the only example of the Burrhel in the same collection (being the specimen noticed by Mr. Ogilby in P. Z. S. 1838, p. 79, as obtained by Lieut. Thomas Smith near the Barinda Pass, and referred to as belonging to this species by Mr. Blyth himself, P. Z. S. 1840, p. 68), I can see but slight grounds for distinction, as far as the horns go. The specimen in question is certainly coloured in an extraordinary way, being of a "dark and rich chestnut-brown." The ordinary Burrhel (*Ovis nahoor*), as may be seen by the fine skins of both sexes of this species, obtained by Capt. Townley Parker, now before us, is of a light brownish ash-colour, white below, with the breast-mark, a stripe on each side, and a stripe down the front of each leg, dark chestnut. According to "Mountaineer," who has given an excellent account of the Burrhel and its habits in the 'India Sporting Review' (vol. vi. p. 152), these chestnut markings become black in fully adult males, and are "most observable immediately after the animal changes his coat, which happens in July." With reference to the *Ovis burrhel* of Mr. Blyth, "of a dark mahogany colour," the same experienced observer remarks, "Amongst some hundreds I have killed and many thousands I have seen in my excursions I have never met with but one variety." This he describes nearly in the same terms as I have mentioned above.

The horns of the *Ovis polii* of Central Asia are sometimes brought to this country from the Himalayas; but there is no reason to believe that this animal occurs nearer to India than the plateau of Pamîr.

## 2. NOTES ON SOME YOUNG HYBRID BEARS BRED IN THE GARDENS OF THE ZOOLOGICAL SOCIETY. BY A. D. BARLETT.

In the Bear-pit in the Gardens a male Black Bear of America (*Ursus americanus*) has been kept for a long time with a female of the European Brown Bear (*Ursus arctos*). In the month of May these bears were seen to copulate, and on the 31st of last December the female produced three young ones; which, when born, were *naked* and *blind*, and about the size of a full-grown rat.

The mother was seen to carry one of these young ones in her mouth a day or two after they were born, and, as it disappeared, it is supposed that she devoured it. Probably it was not healthy. The other two remained and continued to grow, and at the age of five weeks were as large as a common rabbit. Their eyes began to open by this time; they were covered with a short thick fur, and were nearly black.

On examining these young bears it was found they were male and female, and the number and situation of the teats appears somewhat remarkable. They have six teats, four of them placed in front between the fore legs, and two of them in the lower part of the abdomen. Another singular fact is, that the female during the time she

was suckling these young ones fed most sparingly, and rarely took any drink. From the before-mentioned observations we may infer that the period of gestation of the Bears is about seven months.

3. NOTE ON THE SUPPOSED OCCURRENCE OF THE *HIRUNDO BICOLOR* OF NORTH AMERICA IN ENGLAND. BY ALFRED NEWTON, M.A., F.Z.S., &c.

I venture to send for exhibition a skin of the North American *Hirundo bicolor* of Vieillot, which was formerly the property of my late very good friend Mr. John Wolley, and which there can be little doubt was obtained from a bird killed in this country, though Mr. Wolley, with that admirable caution which distinguished him in recording the reported occurrence ('Zoologist,' 1853, p. 3806), was careful to mention that there was "a possibility of mistake" in the matter.

I think that perhaps some members of the Society will view this specimen with a certain amount of interest; but, apart from this, my object in its exhibition is mainly to draw the attention of naturalists to a matter which is every day becoming of greater consequence to those ornithologists who chiefly occupy themselves with the Avifauna of any one district. I refer to the occurrence within particular limits of strong examples of exotic species. It is not only "British bird" students who find in these alien immigrants a great cause of perplexity. To whatever country we go, we are, perhaps before we have well ascertained the number of the *bonâ fide* species, puzzled by some wanderer turning up exactly where he was least wanted. In my own opinion, the ornithologist must accept his position with all its responsibilities; he chooses to study a class of beings, some of whom, for all sublunary purposes at least, are blest with almost infinite powers of locomotion. He must, therefore, not complain if in the course of a morning's walk here in England, an Australian Swift flies in his face, or he picks up a dead Crossbill of a Transatlantic species; and he must invoke no *Deus ex machina* in the shape of an auxiliary-screw clipper or a careless aviary-keeper to account for the incident. Facts like these hardly admit of a doubt, and force themselves day by day more and more upon the notice of the thoughtful naturalist. For some time, indeed, European ornithologists have been accustomed to regard the properly authenticated appearance of an exotic species, which there may be good reason to suppose have reached our shores without intentional human aid, as sufficient ground for including it in the list of our birds. But as observers have of late so largely increased, so have these occurrences been more frequently noticed; and it seems absolutely necessary to prescribe some limit to prevent our really native species from being outnumbered by these foreigners. The difficulty is to know where to draw the line; and to this point I would invite the careful consideration of naturalists. It may be all very well to call *Thalassi-*

*droma wilsoni* and *Mergus cucullatus* European birds; but because a single individual of *Regulus calendulus* or *Dendroica virens* has reached the Old World, it is absurd to include either of those species in its Fauna. I cite these instances, because they are all from that continent whence most of our occasional visitants arrive; so much so, that one is almost driven to the conclusion that there is no *primâ facie* reason why examples of the greater number of birds of Eastern North America should not, *favente zephyro* (the prevailing strong wind in Western Europe), make their appearance on our shores in course of time. Then, on the other hand, the last two additions to the list of so-called "British birds" have been from the opposite quarter. Are *Syrnhaptus paradoxus* and *Xema ichthyætus* to take their places in the books elucidating British Ornithology by the side of the Red Grouse and the Peewit Gull? It appears to me that we gain nothing by deferring a decision on the subject, and I trust that these remarks will not be deemed unnecessary by those who are competent to deal with the matter.

Elveden, 28 February, 1860.

4. DESCRIPTION OF A NEW GENUS OF BOIDÆ DISCOVERED BY MR. BATES ON THE UPPER AMAZON. BY DR. J. E. GRAY.

(Reptilia, Pl. XXIV.)

Fam. BOIDÆ.

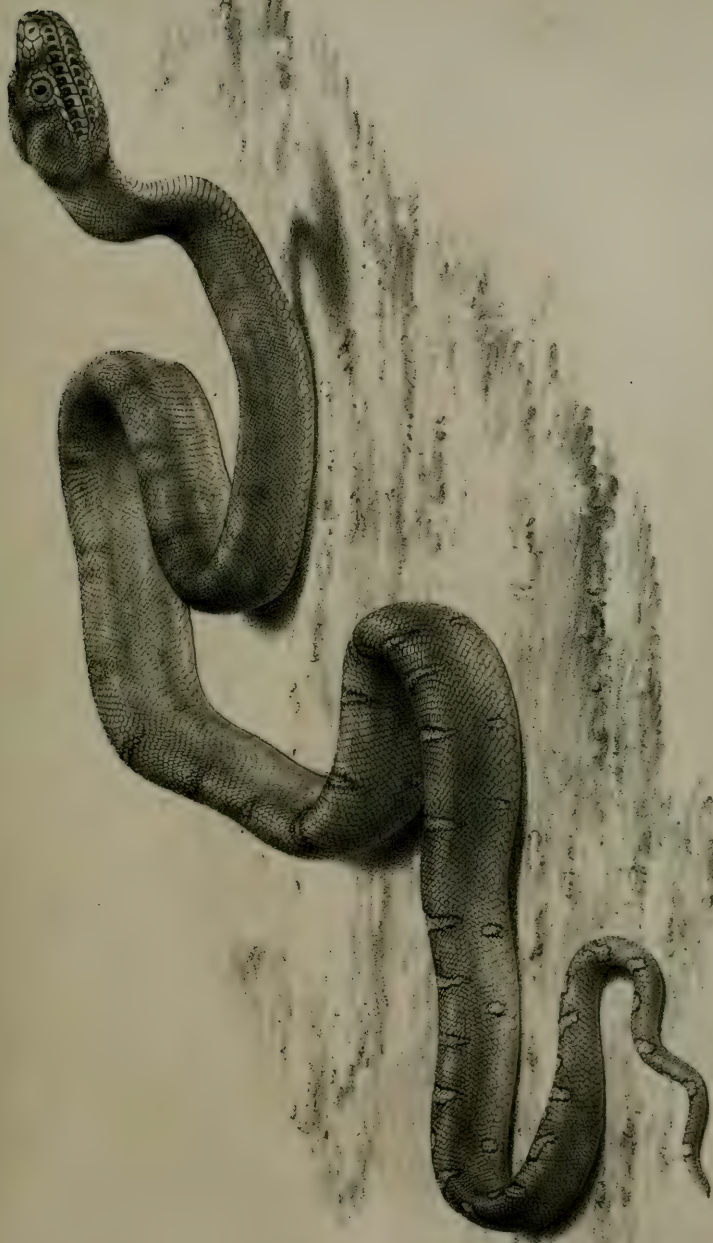
CHRYSENIS, n. g.

Head rather large, rather depressed, covered with scales, the front half covered with small symmetrical shields, as follows:—two pair in an arched series behind the rostral and nasal, and four pair forming a ring round the pair of small central frontal shields; loreal shields two; eyes surrounded by a series of small shields, with a series of four or five small superciliary shields above them; forehead, crown, and cheeks covered with small granular scales; rostral plate with a pit on each edge; upper labial shields low, with a large deep pit on their hinder edge; front lower labial shields simple, high, the hinder short, with a very deep pit on the hinder edge of each of them; nostrils situate between two moderately sized, nearly equal, nasal shields; pupils erect, oblong; body compressed, rounded above and below; tail conical, with a single series of subcaudal plates.

This genus resembles *Epicrates* as to the shields on the muzzle, but differs in the distinctness and form of the pits on the labial shields.

CHRYSENIS BATESII (Pl. XXIV.).

Pale brown, with a series of oblong subangular black-edged pale spots on the hinder part of the back, which become broader and more distinct as they approach the end of the tail, and with a series of distant small roundish black-edged spots on the lower part of the



*Chrysenis batesii*









G. B. Sowerby, lith.

Vincent Brooks lith

1. *Cylindrella splendida*, Pfr. 2. *C. arctospira*, Pfr. 3. *C. grandis*, Pfr.  
 4. *Helix acmella*, Pfr. 5. *H. mouhoti*, Pfr. 6. *H. æquatoria*, Pfr.  
 7. *H. bougainvillei*, Pfr. 8. *H. isis*, Pfr. 9. *H. apollo*, Pfr.





J. S. Sowerby, lith.

Vanessa Press, Imp.

1 *Cypraea conpta* *Linea* 2 *Cypraea* *caerensis* *Bo* 3 *Cypraea* *caerensis* *Bo* 4 *Cypraea* *caerensis* *Bo*  
 5 *Strophomena* *caerensis* *Bo* 6 *Strophomena* *caerensis* *Bo* 7 *Strophomena* *caerensis* *Bo*  
 8 *Strophomena* *caerensis* *Bo* 9 *Strophomena* *caerensis* *Bo* 10 *Strophomena* *caerensis* *Bo*  
 11 *Strophomena* *caerensis* *Bo*

middle of the body, the hinder spot largest and nearest to the edge of the ventral shield.

*Hab.* Upper Amazon.

5. DESCRIPTIONS OF THIRTY-SIX NEW SPECIES OF LAND-SHELLS FROM MR. H. CUMING'S COLLECTION. BY DR. L. PFEIFFER.

(Mollusca, Pls. L., LI.)

1. *HELIX BOUGAINVILLEI*, Pfr. (Pl. L. fig. 7.) *T. imperforata, globoso-conoidea, solidiuscula, striatula, irregulariter malleata et sulcis nonnullis spiralibus notata, nitida, saturate castanea; spira conoidea, vertice subtili, obtusulo; sutura pallide marginata; anfr. 5 modice convexi, regulariter accrescentes, ultimus rotundatus, periphæria obtuse angulatus; columella lata, oblique substrictè descendens; apertura diagonalis, rotundato-lunaris, intus nitide cærulescens; peristoma albo-callosum, breviter expansum, marginibus callo crassiusculo junctis, dextro regulariter arcuato.*

Diam. maj.  $62\frac{1}{2}$ , min. 51, alt. 39 mill.

*Hab.* Bougainville Island.

2. *HELIX APOLLO*, Pfr. (Pl. L. fig. 9.) *T. imperforata, turbinate-depressa, solida, carinata, oblique striata et sub lente minutissime granulata, opaca, lutea, lineis fuscis irregulariter circumdata; spira breviter conoidea, obtusa; anfr. 4 vix convexiusculi, ultimus acute carinatus, antice leviter descendens, basi convexus; apertura diagonalis, rhombéo-lunaris, intus lactea; perist. crassum, album, breviter reflexum, margine basali dilatato, in regione umbilicali adnato, tuberculo elongato prope insertionem prædito.*

Diam. maj.  $46\frac{1}{2}$ , min.  $87\frac{1}{2}$ , alt. 22 mill.

*Hab.* Isle of Cuba.

3. *HELIX ISIS*, Pfr. (Pl. L. fig. 8.) *T. umbilicata, depressa, solidula, striatula, unicolor castanea; spira vix elevata; anfr. 5 vix convexiusculi, sensim accrescentes, ultimus antice subdeflexus, periphæria obsolete angulatus, subtus convexior; apertura obliqua, late lunaris, intus submargaritacea; perist. album, marginibus vix convergentibus, supero subhorizontali, expanso, basali late reflexo, ad insertionem breviter ascendente, umbilicum mediocrem lamina dilatata semioccultante.*

Diam. maj. 45, min. 38, alt. 19 mill.

*Hab.* Admiralty Islands.

4. *HELIX ÆQUATORIA*, Pfr. (Pl. L. fig. 6.) *T. imperforata, conoideo-depressa, solida, striatula et subtilissime punctato-granulata, subcarinata, saturate castanea; spira convexo-conoidea; anfr. 5, convexiusculi, ultimus antice deflexus, rotundatus, turgidus; apertura perobliqua, sinuato-lunaris; perist.*

*fusco-carneum, incrassatum, reflexum, marginibus callo funiculari junctis, supero arcuato, intus calloso (callo ad dextram abrupte desinente), dextro acute unidentato, basali dilatato subappresso, intus medio tuberculo valido compresso munito.*

Diam. maj. 38, min. 32, alt. 20 mill.

*Hab.* Republic of Ecuador (*Mr. Fraser*).

5. *HELIX LIVESAYI*, Pfr. *T. umbilicata, lenticularis, carinata, solidiuscula, capillaceo-striata et striis spiralibus obsolete granulata, sericea, corneo-albida, fasciis castaneis superne 2, basi unica ornata; spira conidea, obtusa; sutura albomarginata; anfr. 5 convexiusculi, ultimus carina acuta, prominente, alba munitus, aperturam versus superne convexior, inde angustatus, subito deflexus, subtus scrobiculatus; apertura fere horizontalis, transverse subrhombico-ovalis; perist. continuum, album, expansum et reflexum, margine basali intus valide unidentatum, umbilicum angustum semitegente.*

Diam. maj. 25, min. 21, alt. 10 mill.

*Hab.* Philippine Islands.

6. *HELIX CASEUS*, Pfr. *T. umbilicata, depressa, tenuiuscula, irregulariter striata et sub lente minutissime granulata, diaphana, albido-cornea vel pallide rufescens; spira vix elevata; sutura impressa; anfr. 4½ planiusculi, ultimus superne obtuse carinatus, antice deflexus, basi turgidus, circa umbilicum conicum angulatus; apertura diagonalis, subelliptica; perist. album, undique sublata reflexum, marginibus approximatis, basali leviter arcuato, juxta umbilicum dilatato.*

Diam. maj. 18, min. 15, alt. 9 mill.

*Hab.* Siam.

7. *HELIX ALBICOSTIS*, Pfr. *T. sublata umbilicata, depressa, tenuis, granulato-rugosa et pilis brevibus obsita, cornea, costulis obliquis albidis munita; spira parum elevata; anfr. 4 convexiusculi, ultimus superne subangulatus, supra angulum leviter sulcatus, antice deflexus; apertura perobliqua, ovalis; perist. tenue, marginibus fere contiguis, supero expansiusculo, basali breviter reflexo.*

Diam. maj. 9½, min. 8, alt. 4½ mill.

*Hab.* Ahmednuggur, India.

8. *HELIX HETÆRA*, Pfr. *T. mediocriter umbilicata, conoideo-depressa, tenuiuscula, oblique irregulariter rugulata et undique minute granulata, pallide lutescens, fasciis 3 rufis, 1 suturali, 2 approximatis periphericis cincta; spira breviter conoidea; anfr. 6 modice convexi, lente accrescentes, ultimus antice vix descendens; apertura obliqua, lunaris, intus submargaritacea; perist. fusco-carneum, breviter reflexum, juxta umbilicum dilatatum.*

Diam. maj. 19, min. 16, alt. 10½ mill.

*Hab.* Unknown.

9. *HELIX ACMELLA*, Pfr. (Pl. L. fig. 4.) *T. subobtecte perforata, turbinata, solidula, lævigata, nitida, lutea, sursum pallidior; spira regulariter turbinata, vertice minutissimo, acuto; anfr. 6 convexi, ultimus non descendens, basi planior; apertura diagonalis, subquadrangulari-ovalis; perist. album, reflexum, margine dextro subflexuoso, columellari longe adnato, umbilicum canaliformem fingente.*

Diam. maj. 26, min. 22, alt. 25 mill.

*Hab.* Admiralty Islands.

10. *HELIX LIRATULA*, Pfr. *T. umbilicata, trochiformis, tenuiuscula, striata et liris filiformibus subconfertis cincta, diaphana, oleoso-micans, pallide corneo-lutescens; spira conica, apice obtusa; sutura impressa; anfr. 7½ convexiusculi, ultimus angulatus, non descendens, basi lævior, convexior; apertura vix obliqua, subangulato-lunaris; perist. simplex, rectum, margine columellari declivi, juxta umbilicum perangustum subdilata-to.*

Diam. maj. 6, min. 5½, alt. 4 mill.

*Hab.* Ceylon, 6000', under decayed woods (Mr. Thwaites).

11. *HELIX BATESII*, Pfr. *T. umbilicata, depressa, tenuis, dense et oblique plicatula, cornea, pliculis albidis; spira convexa, parum elata; anfr. 5 convexiusculi, regulariter accrescentes, ultimus non descendens, subdepressus, basi convexior; umbilicus latus, ¼ diametri subæquans; apertura diagonalis, rotundato-lunaris; perist. simplex, rectum, margine basali arcuato, ad insertionem vix patente.*

Diam. maj. 11, min. 9½, alt. 5 mill.

*Hab.* Upper Amazon (Mr. Bates).

12. *HELIX TURNERI*, Pfr. *T. anguste et clauso-umbilicata, depressa, subdiscoidea, tenuiuscula, conferte plicato-costata, diaphana, nitidula, corneo-lutescens, rufo variiegata et ad suturam distincte maculata; spira vix elevata; sutura denticulata; anfr. 4 convexiusculi, regulariter accrescentes, ultimus, subdepressus, non descendens, loco umbilici lamina vitrea obtectus; apertura fere diagonalis, subtriangulari-lunaris; perist. simplex, rectum, marginibus distantibus, supero antrorsum arcuato, basali medio denticulo albo munito, ad insertionem subdilata-to.*

Diam. maj. 7¼, min. 6¼, alt 3 mill.

*Hab.* New Caledonia (Mr. Turner).

13. *HELIX NAGPORENSIS*, Pfr. *T. latissime umbilicata, depressa, tenuiuscula, oblique striata, opaca, carneo-albida; spira medio vix prominula; anfr. 4 convexiusculi, ultimus subtus vix latior, antice deflexus et subtus subconstrictus; apertura perobliqua, transverse ovalis; perist. tenue, marginibus convergentibus, supero recto, basali breviter reflexo.*

Diam. maj. 10, min. 8, alt. 4 mill.

*Hab.* Nagpore, India (Mr. Jerdon).

14. *HELIX TRISTRAMI*, Pfr. *T. late umbilicata, perdepressa, acute carinata, tenuis, oblique plicato-strata, opaca, sordide albida, corneo obsolete variegata; spira vix elevata; sutura carina leviter exserta marginata; anfr. 5 planiusculi sensim accrescentes, ultimus infra carinam compressam, crenulatam convexus, antice non descendens; apertura obliqua, subsecuri-formis; perist. rectum, intus sublabiatum, margine supero antrosum arcuato.*

Diam. maj. 12, min.  $10\frac{1}{2}$ , alt. 4 mill.

*Hab.* Interior of Tunis (Mr. Tristram).

15. *HELIX MENDICARIA*, Pfr. *T. mediocriter umbilicata, conoideo-semiglobosa, solidula, striata et sub lente breviter pilosa, cornea; spira conoidea, vertice subtili nitido; anfr.  $4\frac{1}{2}$  turgidi, ultimus vix descendens; apertura parum obliqua, lunato-sub-circularis; perist. simplex, rectum, marginibus convergentibus, columellari vix dilatato, non reflexo.*

Diam. maj. 8, min. 7, alt.  $4\frac{2}{3}$  mill.

*Hab.* Interior of Tunis (Mr. Tristram).

16. *HELIX (NANINA) DÖHRNIANA*, Pfr. *T. perforata, depressa, suborbicularis, tenuiuscula, sublævigata, parum diaphana, lutescenti-grisea; spira breviter conoidea, vertice minuto, obtuso; anfr.  $6\frac{1}{2}$  convexiusculi, regulariter accrescentes, ultimus non descendens, supra medium obsolete subangulatus, basi vix convexior, nitidior; apertura fere verticalis, transverse lunaris; perist. simplex, rectum, margine columellari declivi, levissime arcuato, ad perforationem reflexiusculo.*

Diam. maj.  $31\frac{1}{2}$ , min. 28, alt. 15 mill.

*Hab.* Siam (Mr. Mouhot).

17. *HELIX (NANINA) MOUHOTI*, Pfr. (Pl. L. fig. 5.) *T. perforata, orbiculato-depressa, tenuiuscula, minute costulato-striata et superne lineis spiralibus impressis decussata, superne pallide cinnamomea, basi nitida, corneo-albida; spira convexa; sutura rufulo-marginata; anfr. 6 convexiusculi, lente accrescentes, ultimus non descendens, subtus convexior; apertura obliqua, lunaris; perist. simplex, rectum, margine columellari leviter arcuato, ad perforationem apertam triangulatim reflexo.*

Diam. maj. 26, min. 23, alt. 14 mill.

*Hab.* Siam (Mr. Mouhot).

18. *BULIMUS SATURANUS*, Pfr. *T. imperforata, subfusiformi-oblonga, solida, lilaceo-carnea, fusco-flammulata; spira conica, apice acutiusculo, albo; anfr.  $6\frac{1}{2}$ , summi lævigati, sequentes oblique striati, ultimus lævior, rarioribus nonnullis latis nigricantibus munitus, spira paulo brevior, basi attenuatus; columella crassa, torta, nigra; apertura subverticalis, acuminato-oblonga; perist. nigrum, breviter reflexum, marginibus callo nigro junctis.*

Long. 76, diam. 33 mill.

*Hab.* Pallatanga, Republic of Ecuador (Mr. Fraser).



19. *BULIMUS FRASERI*, Pfr. (Pl. LI. fig. 5.) *T. imperforata, oblongo-fusiformis, solida, longitudinaliter conferte striata et lineis impressis remotis cincta, sub epidermide virenti-fulva, non nitente, carnea, fasciis interruptis sagittatis vel fulguratim confluentibus atrofuscis ornata; spira conica, apice obtusula; anfr. 6 convexiusculi, ultimus spiram subæquans, basi attenuatus; columella violacea, superne plica valida munita, basi subtorta; apertura obliqua, semielliptica, basi subangulata, intus lactea; perist. roseum, incrassatum et expansum, marginibus callo nitidissimo, lilacino, intrante junctis, columellari angusto, adnato.*

Long. 89, diam. 37 mill.

*Hab.* Province of Cuenca, republic of Ecuador (Mr. Fraser).

20. *BULIMUS SCHOMBURGI*, Pfr. (Pl. LI. fig. 9.) *T. subim-perforata, dextrorsa vel sinistrorsa, solida, striatula, sub epidermide viridi, saturatius lineata et radiatim detrita alba; spira conica, vertice acutiusculo, atro-violaceo; anfr. 7 convexiusculi, supremi violaceo-fasciati, ultimus spira brevior, basi attenuatus; columella inflata, substricta, violacea; apertura parum obliqua, truncato-ovalis, intus alba; perist. incrassatum, reflexum, lilaceum, marginibus callo nigro-castaneo junctis, columellari dilatato, fornicatim reflexo, subadnato.*

Long. 48, diam. 23 mill.

*Hab.* Siam.

21. *BULIMUS STUTCHBURYI*, Pfr. (Pl. LI. fig. 8.) *T. subumbilicata, ovato-fusiformis, tenuiuscula, striata, striis spiralibus subtilissime decussatula, nitida, fulva, lineis saturatioribus radiata; spira subregulariter conica, obtusula; sutura albofilosa; anfr. 5 vix convexiusculi, ultimus  $\frac{3}{5}$  longitudinis adæquans, antice arcuatim breviter ascendens, basi attenuatus; apertura subauriformis, superne acuminata, saepe tuberculo parietali nodiformi coarctata, intus margaritacea; columella alba, leviter plicata; perist. carneo-fulvum vel album, margine dextro subregulariter arcuato, expanso et reflexo, columellari dilatato, plano, fere adnato.*

Long. 53, diam. 11 mill.

*Hab.* Erumanga, New Hebrides.

22. *BULIMUS PYROSTOMUS*, Pfr. *T. profunde rimata, ovato-conica, solidula, striata et striis spiralibus levibus irregulariter rotata, castanea, saturatius strigata; spira conica, acutiuscula; sutura mediocris, simplex; anfr. 5 modice convexi, ultimus spiram paulo superans, medio inflatus; columella substricta; apertura vix obliqua, acuminato-ovalis, intus igneo-fusca, nitida; perist. incrassatum, rectum, igneum, marginibus callo junctis, dextro leviter arcuato, columellari dilatato, libero.*

Long. 42, diam. 19 mill.

*Hab.* Erumanga, New Hebrides.

23. *BULIMUS TURNERI*, Pfr. (Pl. LI. fig. 10.) *T. imperforata, ovato-acuta, succinoidea, tenuis, striatula, corneo-albida, fasciis olivaceo-fuscis, saturatius strigatis, ornata; spira conica, acutiuscula; anfr. 4 convexiusculi, ultimus  $\frac{2}{3}$  longitudinis superans, basi vix angustatus; columella compressa, callosa, filaris; apertura parum obliqua, acuminato-ovalis, intus nitida; perist. simplex, tenue, breviter expansum, margine dextro subflexuoso, columellari adnato.*

Long. 32, diam. 17 mill.

*Hab.* Erumanga, New Hebrides (Mr. Turner).

24. *BULIMUS COLUBRINUS*, Pfr. (Pl. LI. fig. 4.) *T. umbilicata, fusiformi-oblonga, solidula, striata et sulculis obliquis et spiralibus irregulariter granulata, nitida, fulva, strigis fulminantibus, nigro-castaneis ornata; spira conica, acuminatiuscula, superne nuda, purpurascens; anfr. 5 convexi, ultimus spiram paulo superans, basi saccatus; columella albida, crassa, torta, leviter prominens; apertura subverticalis, oblongo-ovalis, intus ignea, nitidissima; perist. subincrassatum, albido-limbatum, marginibus callo igneo junctis, dextro breviter expanso, columellari dilatato, patente.*

Long. 56, diam. 23 mill.

*Hab.* New Caledonia (Mr. Turner).

25. *ORTHALICUS BOUCARDI*, Pfr. (Pl. LI. fig. 7.) *T. conico-ovata, solidula, striatula, striis spiralibus sub lente vix conspicuis decussatula, opaca, alba, strigis latis fuscis picta et varicibus nigris instructa; spira conica, obtusula; sutura subcrenata, albo-marginata; anfr.  $5\frac{1}{2}$  convexiusculi, ultimus spiram æquans; columella pilaris, alba, stricte recedens; apertura obliqua, angulato-ovalis, intus alba, nigro-strigata; perist. rectum, nigro-limbatum, marginibus callo nitido, nigro-castaneo junctis.*

Long. 43, diam. 25-26 mill.

*Hab.* Mexico (Mr. Boucard).

26. *ACHATINA GREVILLEI*, Pfr. *T. ovato-oblonga, solida, striatula, sub epidermide tenui, fuscula olivaceo-lutescens; spira conica, obtusa; sutura crenulata, late impresso-marginata; anfr. 6-7, supremi minutissime decussati, ultimus spiram superans, sublævigatus, peripheria obsolete angulatus; columella subtorta, purpurea, anguste truncata; apertura parum obliqua, angulato-ovalis, intus margaritaceo-albida; perist. tenue, expansiusculum, marginibus callo purpureo, sursum pallidiore, junctis, dextro repando.*

Long. 105, diam. 55 mill.

*Hab.* Old Calabar.

27. *OLEACINA INDUSIATA*, Pfr. *T. ovato-oblonga, solidula, angulis longitudinalibus et striis confertis decussata, fulva, epidermide castanea, irregulariter detrita, oblecta; spira conica,*

*apice obtusa; sutura subcrenata; anfr. 5½ convexiusculi, ultimus subinflatus, a medio deorsum striis spiralibus destitutus; columella arcuata, basi late truncata; apertura verticalis, acuminato-ovalis, intus margaritacea; perist. rectum, acutum.*

Long. 43, diam. 22 mill.

*Hab.* La Parada, Oajaca, Mexico (*Mr. Sallé*).

28. *CYLINDRELLA GRANDIS*, Pfr. (Pl. L. fig. 3.) *T. profunde rimata, turrata, late truncata, solidiuscula, oblique filoso-striata, interstitiis sub lente oblique striatulis, nitidula, fuscorubella; sutura sub-albo-marginata; anfr. superst. 8 convexiusculi, ultimus basi obtuse carinatus, antice vix protractus; columella subplicata; apertura vix obliqua, ovalis, superne subangulata; perist. continuum, breviter expansum, vix reflexiusculum.*

Long. 56, diam. 17 mill.

*Hab.* Juquila, Mexico (*Mr. Boucard*).

29. *CYLINDRELLA MEXICANA*, Cuming in litt. *T. sulcato-rimata, turrata, truncata, leviter arcuato-striata et sub lente punctulata, parum nitens, violaceo-fusca; sutura levis, subalbida; anfr. superst. 10 planiusculi, ultimus infra medium obtuse angulatus, antice protractus, dorso carinatus; columella plica compressa, dentiformi munita; apertura vix obliqua, irregulariter ovalis, superne angulata; perist. continuum, undique reflexum, margine dextro incrassato, regulariter arcuato, sinistro sinuoso.*

Long. 55, diam. 15 mill.

*β. Minor, anfr. superst. 8. Long. 32½, diam. 10 mill.*

*Hab.* Mexico.

30. *CYLINDRELLA SPLENDIDA*, Pfr. (Pl. L. fig. 1.) *T. rimata, turrata, late truncata, solidula, oblique filoso-costulata, nitidula, carneo-violacea; sutura sub-albo-filosa, crenulata; anfr. superst. 8-8½ modice convexi, ultimus obsolete filo-carinatus, antice breviter solutus; columella subplicata; apertura fere verticalis, oblique ovalis; perist. continuum, album, breviter reflexum, superne subangulatum.*

Long. 46, diam. 15 mill.

*Hab.* Zacatepec, Mexico (*Mr. Boucard*).

31. *CYLINDRELLA ARCTOSPIRA*, Pfr. (Pl. L. fig. 2.) *T. rimata, cylindraceo-turrata, late truncata, solidula, confertim subarcuato-costata, subopaca, albida; sutura profunda, subnodulosa; anfr. superst. 18, arcte voluti, convexi, ultimus angustior, filo-carinatus, antrorsum breviter protractus; apertura parvula, obliqua, oblique ovalis; perist. continuum, nitidum, undique breviter reflexum, margine sinistro lateraliter producto.*

Long. 38, diam. 10 mill.

*Hab.* Juquila, Mexico (*Mr. Boucard*).

32. *CYLINDRELLA CRETACEA*, Pfr. *T. rimata, oblongo-turrita, cretacea; spira medio ventrosior, apice subtruncata, vel in conum brevem abiens; sutura levis; anfr. 13-14 vix convexiusculi, lævigati, penultimus semiplicatus, ultimus valide costatus, basi compresso-carinatus, antice horizontaliter et breviter protractus; apertura verticalis, subtriangularis; perist. continuum, undique rectangule patens.*

Long. 24, diam. 7 mill.

*Hab.* Mexico.

33. *CLAUSILIA ADAMSIANA*, Pfr. *T. vix rimata, turrito-fusi-formis, solidula, oblique distincte et confertim striata, oleomicans, diaphana, fusco-cornea; spira medio subinflata, apice obtusula; anfr. 8 convexiusculi, ultimus angustus, solutus, deorsum protractus, basi rotundatus; apertura obliqua, pyriformi-subcircularis; lamellæ approximatae, subparallelae, superior producta, acuta, inferiore minor, profundior; lunella distincta, filaris, arcuata; plica palatalis 1 supera, subcolumellaris inconspicua; perist. tenue, fuscum, undique subæqualiter expansum.*

Long. 18-19, diam.  $4\frac{1}{3}$ - $4\frac{1}{2}$  mill.

*Hab.* South America.

34. *CLAUSILIA TRISTRAMI*, Pfr. *T. vix rimata, subfusiformi-turrita, solidula, conferte filoso-striata, opaca, sordide liliacea; spira convexiusculo-turrita, apice cornea, obtusula; sutura levissima, subsimplex; anfr. 12 planiusculi, ultimus basi compresso-gibbosus; apertura verticalis, elliptica, intus carneo-fusca; lamellæ tenues, convergentes; lunella crassa, albida, arcuata; plica palatalis 1 supera, elongata; subcolumellaris inconspicua; perist. album, continuum, breviter reflexum, superne adnatum, margine externo intus subdentato.*

Long. 21, diam.  $4\frac{1}{3}$ - $4\frac{1}{2}$  mill.

*Hab.* Southern slope of the Atlas, Interior of Tunis (*Mr. Tristram*).

35. *CYCLOPHORUS CONFLUENS*, Pfr. *T. late umbilicata, depressa, solida, striis confertis confluentibus et cruciatis superne sculpta, lutea, fasciis castaneis, pallide punctatis, superne confluentibus, subtus distinctis ornata; spira subplana; sutura impressa; anfr.  $4\frac{1}{2}$  convexiusculi, ultimus antice ad insertionem cucullatim dilatatus; apertura diagonalis, subcircularis, intus albida; perist. subinterruptum, margine supero elevato, sinuato, dextro expansiusculo, basali reflexiusculo, columellari angusto. Operc. corneum, arcispirum.*

Diam. maj. 25, min.  $20\frac{1}{2}$ , alt. 9 mill.

*Hab.* Borneo.

36. *PARTULA TURNERI*, Pfr. *T. profunde rimato-umbilicata, ovato-conica, solidula, sub lente spiraliter undulato-striata, nitida, pallide lutescens, strigis saturatioribus radiata; spira conica, acutiuscula; anfr. 5 convexi, ultimus spira vix brevior,*

*basi subcompressus; columella simplex, leviter arcuata; apertura parum obliqua, oblonga; perist. album, nitidum, undique latiuscule expansum, marginibus conniventibus, columellari patente.*

Long. 22-23, diam. 11-12 mill.

*β. Paulo ventrosior, albido et isabellino radiata.*

*Hab.* Erumanga, New Hebrides (Mr. Turner).

6. DESCRIPTIONS OF NEW SPECIES OF MOLLUSCA FROM THE SANDWICH ISLANDS. BY W. HARPER PEASE. (COMMUNICATED BY DR. J. E. GRAY.) (Part II.)\*

Genus POLYBRANCHIA.

Body oblongo-ovate, provided with several rows of lobes, commencing at anterior portion of the body, and extending in continuous series around the posterior part; lobes deciduous. Branchiæ imbedded in the lobes. Cephalic tentacles bifurcate.

52. POLYBRANCHIA PELLUCIDA.

*Animal.*—Oblong-ovate, pellucid. Cephalic tentacles long, cylindrical, slightly tapering to a blunt point, bifurcate from the base, one part curving slightly anteriorly and the other posteriorly, grooved (?), on the inside, opposite each other. Labial tentacles of same shape, shorter. The body furnished with four rows of lobes, commencing opposite the cephalic tentacles, and passing in continuous series around hinder part of the body, leaving a narrow space on dorsal region bare; lobes deciduous, pellucid, of a jelly-like consistency, close, disposed alternately, those on the edge of the mantle smallest, increasing in size as they ascend over the sides and back of the body, cylindrical at the base, spreading out in a fan-like shape, overlapping each other. Branchiæ imbedded in the substance of the lobes, ramose; the stem commencing at the base of the lobes and branching out, following their form, not extending to the edges of the lobes. Foot same size as the mantle.

This singular species was very active, when handled casting off its upper lobes, and when plunged in alcohol instantly detaching the whole.

53. VEXILLA FUSCO-NIGRA.

Shell abbreviately fusiform, ventricose, solid; spire moderately produced, acute, and less than half the length of the shell; whorls six, convex, furnished with close transverse granular ribs; suture impressed; body-whorl large, ventricose, and marked with coarse, remote, revolving impressed lines, and fine longitudinal striæ and wrinkles; canal short, slightly recurved; aperture oblong-ovate; outer

\* See P. Z. S. for January 11, *antea*, p. 18.

lip thick, somewhat dilated, and furnished with six or seven intramarginal tubercular teeth, sinuated at its junction with body-whorl; columella-lip smooth, flattened, slightly callous above. Colour black or brownish-black, impressed lines on body-whorl light chocolate-colour; lips purplish-brown; teeth white or bluish.

*Animal*.—Foot oblong, truncated in front, rounded behind. Tentacles cylindrically tapering. Eyes lateral and sessile, at about two-thirds of the length of the tentacles. Siphon long. Colour dark greenish-slate, and closely punctured with black and white. Tentacles zoned with brown, tips white.

#### 54. *ENGINA COSTATA*.

Shell solid, fusiformly ovate, attenuated at both ends; spire acute, half the length of the shell; whorls seven or eight, convex, longitudinally ribbed; ribs coarse, rounded, and crossed with numerous transverse spiral ridges, which become somewhat nodulous on the ribs; interstices between the transverse ridges cancellated with raised striæ; sutural lines undulated; canal produced and slightly recurved; aperture narrow, widest above; outer lip much thickened externally; edge sharp, furnished with five or six intramarginal tubercular teeth; columella-lip with a thin callosity, and transversely ribbed on the middle. Colour yellowish-brown; aperture white.

#### 55. *ENGINA MONILIFERA*.

Shell solid, ovate, slightly attenuated at both ends; spire acute, half the length of the shell; whorls six or seven, convexly angulated, ribbed longitudinally; ribs coarse, rounded, crossed with spiral transverse granular ridges, two on each whorl of the spire; suture faintly defined, bordered by a single row of golden-coloured granules; body-whorl sculptured same as the spire; canal short, slightly recurved; aperture narrow, oblong; outer lip nearly straight, thickened externally, and provided with four internal teeth, and three small tubercular teeth on the lower half of columella-lip. Colour white, with a broad, broken, purplish transverse band on the body-whorl, and a narrow one at the margin of the sutures.

#### 56. *ENGINA ALBOCINCTA*.

Shell ovate, brownish red, with a white transverse band on body-whorl; apex acute, longitudinally ribbed, transversely nodosely ridged, finely striated between the ridges; aperture narrow; outer lip denticulated within; canal slightly produced and recurved.

#### 57. *HINDSIA ANGICOSTATA*.

Shell ovate; spire blunt; whorls rounded, longitudinally ribbed, and transversely nodosely ridged; interstices finely striated; aperture oval; outer lip thickened externally; edge of lip sharp, ridged internally; columella-lip arched, slightly callous, wrinkled striæ on upper part; canal slightly produced and recurved. Colour light brown, longitudinal ribs darker, white band on body-whorl.

✓ 58. *BORSONIA LUTEA*.

Shell fusiform, solid, shining; whorls convex, angulated at the sutures, longitudinally regularly and closely ribbed, crossed by regular transverse ridges; aperture narrow; outer lip thick, denticulated within; canal produced and recurved. Colour light yellowish-brown.

962 ✓ 59. *BORSONIA CRASSICOSTATA*.

Shell fusiform, shining, longitudinally coarsely ribbed, crossed by transverse raised striæ; whorls rounded; sutures well impressed; aperture narrow; outer lip denticulated within; canal short, slightly recurved. Colour light yellow.

✓ 60. *BORSONIA BIFASCIATA*.

Shell fusiform, shining, longitudinally coarsely ribbed, crossed by coarse raised striæ; whorls rounded at the sutures; outer lip thick, incurved, serrated on the edges at the termination of the transverse striæ; canal short and slightly recurved. Colour white; two light brown bands on each whorl.

✓ 61. *CLATHURELLA BALTEATA*.

62 Shell fusiformly ovate, longitudinally coarsely ribbed; ribs disposed alternately on the whorls, crossed by transverse raised striæ; whorls roundly angulated at the sutures; outer lip incurved, serrated on its edge by the termination of the transverse striæ. Colour light brown, ornamented by one white band on centre of each whorl.

62. *BORSONIA NEBULOSA*.

Shell fusiformly oblong, finely ribbed longitudinally, striated transversely, forming regular granules; sutures slightly angulated and smooth; aperture oval; outer lip slightly incurved and serrated on its edges, striated internally; canal slightly produced and recurved. Colour white, marked with irregular, interrupted, longitudinal brown lines.

✓ 63. *CLATHURELLA PRODUCTA*.

2 Shell fusiformly elongate, longitudinally ribbed, finely striated transversely; whorls convex; suture impressed; aperture oval; outer lip denticulated; canal short. Colour yellowish-brown; a darker band of same colour on each whorl.

✓ 64. *CLATHURELLA BRUNNEA*.

962 ✓ Shell fusiformly elongate, ornamented with transverse granular ribs, and fine longitudinal raised striæ; whorls slightly convex; aperture elongate-oval; canal short. Colour dark brown.

✓ 65. *CLATHURELLA CYLINDRICA*.

1762 ✓ Shell cylindrically fusiform, shining; apex blunt, longitudinally strongly ribbed, transversely ornamented with raised striæ, forming

deep cancellations; whorls slightly convex, angulated at sutures aperture oval. Colour white.

66. *CLATHURELLA EXILIS*.

1762  
Shell elongately fusiform, ornamented with transverse ribs and longitudinal striæ; whorls slightly convex; aperture oblong-oval; canal short, slightly recurved. Colour white, with irregular yellowish-brown longitudinal spots on upper whorls, and two bands of same colour on body-whorl.

67. *CLATHURELLA ELEGANS*.

Shell elongate-pyramidal, yellowish, with chestnut-brown spots on the centre of varices of each whorl; remote varices extending whole length of the shell, transversely granosely ribbed, interstices finely granulated; whorls convex, rounded; suture well impressed; aperture wide, ovate; outer lip acute; canal produced and recurved.

68. *CLATHURELLA HARPA*.

Shell pyramidally ovate; body-whorl ventricose, longitudinally strongly ribbed; ribs rather distant; interstices finely striated longitudinally; whorls roundly angulated at the sutures; outer lip acute, somewhat dilated; aperture large, oval; columella-lip striated obliquely on lower part; canal short, slightly recurved. Colour white.

69. *CLATHURELLA PULCHELLA*.

1762  
Shell fusiform, acuminate, shining, longitudinally ribbed, crossed by transverse raised striæ; whorls rounded; suture impressed; aperture oval; canal slightly produced and recurved; pinkish-white, irregular pink spots over the surface; apex red.

70. *CLATHURELLA PAUCICOSTATA*.

Shell elongately fusiform, thin, shining; whorls ornamented with varices, remote, and fine transverse raised striæ; outer lip thin; aperture elongate-oval; canal long and slightly recurved. Colour white, with irregular orange-brown spots or blotches; varices white.

71. *CLATHURELLA FUSCOMACULATA*.

Shell acuminate turreted, ornamented with transverse raised striæ, slightly granulose; outer lip thin; aperture oval; canal straight and slightly produced. Colour white, with irregular longitudinal bands of reddish-brown.

72. *CLATHURELLA BUCCINOIDES*.

Shell pyramidally ovate, shining; whorls rounded, longitudinally ribbed, crossed by transverse striæ; aperture ovate; outer lip serrated at edge; canal short, slightly recurved. Colour yellowish white.



73. *NASSA MICROSTOMA*.

Shell oblong-ovate, rather solid, white, sparingly stained with ferruginous brown; spire rather long, acute; whorls six or seven, strongly convex, ribbed longitudinally, ribs stout, close set, rounded and crossed with numerous close spiral ridges; aperture small, rounded, lyrated within; outer lip thick; columella arched, transversely wrinkled above, one or two faint spiral plicæ near the base.

74. *DRILLIA NODIFERA*.

Shell elongate-ovate, smooth, plicately noduled longitudinally; outer lip thin, acute; canal short; nodules white, interstices reddish brown, base white.

✓ 75. *OLIVA SANDWICENSIS*.

Shell oblong-ovate; spire somewhat acuminate; columella-plaits few in number, extending two-thirds of the length of the aperture; outer lip slightly thickened internally. Colour minutely freckled and blotched with white, reddish brown and cinereous, the lower half of the body-whorl being much the darkest; apex white, encircled beneath the suture with a light fawn-coloured or whitish band, blotched with dark reddish brown or cinereous; aperture white, two broad, equidistant dark brown bands on the interior, reaching to the thickened portion of the outer lip.

76. *BLAUNERIA GRACILIS*.

Shell elongate fusiform, thin, corneous, fragile, semipellucid. Whorls seven or eight, flatly convex, finely longitudinally obliquely striated; suture faintly impressed, outer lip thin; columella-lip flexuous; one oblique plait near the centre, truncated; aperture oblong-ovate, contracted posteriorly.

*Animal*.—Small, subpellucid, uncoloured, excepting a yellow tinge around the mouth. Tentacles short, stout, approximating at their bases. Eyes conspicuous, black, immersed at the posterior bases of the tentacles. Head deep, narrow above, and much dilated below. Mouth a simple longitudinal slit. Foot small, short, bluntly rounded behind, truncated in front, divided by a transverse groove; posterior portion slightly the longest.

77. *TURRICULA BELLA*.

Shell fusiform; spire acuminate; whorls convexly angulated; sutures rather deep, longitudinally ribbed, ribs somewhat angular, irregular in size and finely striated longitudinally, also the interstices, and crossed by numerous transverse striæ; base slightly recurved; columella four-plaited, a callosity posteriorly; aperture lyrated within. Colour light chestnut brown, with broad lighter or whitish bands, and spotted remotely and irregularly with reddish brown; base white.

78. *TURRICULA APPROXIMATA*.

Shell ovate, turreted; whorls convexly angulated at the sutures, longitudinally ribbed, crossed by impressed striæ; interstices punctured; aperture striated within; columella four-plaited. Colour white, banded and blotched irregularly with chestnut brown.

79. *MITRA PALLIDA*.

Shell fusiform; spire elongate, slender, pointed, surface latticed by fine longitudinal and transverse striæ; columella five-plaited. Colour white or light yellow.

80. *MITRA PUDICA*.

Shell ovate; spire short, transversely ribbed; interstices finely cancellated, longitudinally remotely ribbed, white, variegated with smoky brown; columella four-plaited.

81. *MITRA ERICEA*.

Shell fusiformly ovate, attenuated at both ends, transversely ribbed; body-whorl crossed by longitudinal striæ, rather remote. Colour light brown; apex white; columella three-plaited.

82. *STRIGATELLA PICEA*.

Shell small, ovate, longitudinally ribbed, row of granules bordering suture, transversely finely striated. Colour dark brown; whorls encircled by a single narrow light-brown belt; columella five-plaited; aperture purplish white.

83. *STRIGATELLA FUSCESCENS*.

Shell ovate, thick, finely crenulated at borders of suture, transversely faintly grooved, the grooves becoming more distinct towards the base; columella five-plaited. Colour brown; aperture white.

84. *MELAMPUS (TRALIA) SEMIPLICATA*.

Shell elongate-ovate, dark reddish brown, with an olive shade; apex acute; whorls eight or nine; spire and upper part of body-whorl plicate; rough striæ of growth on body-whorl; aperture narrow, acute above; two transverse folds on base of columella; one plait on the inner lip below the centre, and three on outer lip.

85. *PEDIPIES SANDWICENSIS*.

Shell ovate globose, brownish yellow; aperture white, solid, ribbed transversely, ribs rather remote and irregular; whorls four, convexly angulated at the sutures, the last whorl ventricose; outer lip flexuous, thickened in the middle; aperture subquadrate; columella-lip flat, furnished with three plaits, of which the upper is the largest, and slightly oblique; remaining two transverse, lower one the smaller.

86. *ERATO SANDWICENSIS*.

Shell pyriform, smooth, shining, white, with a broad band of yel-

lowish brown on lower part of the body-whorl, and a narrower one of same colour bordering the sutures beneath; columella and outer lip white; apex and base tinged with pink; aperture narrow, contracted; outer lip denticulated its whole length; inner lip about one-half its length.

87. *MARGINELLA ORYZA*.

Shell small, subpyriform, thin, transparent, white; aperture narrow; outer lip denticulate; inner lip four-plaited, finely striated longitudinally.

88. *MARGINELLA SANDWICENSIS*.

Shell minute, subconoidal, thin, transparent white; aperture narrow, contracted; apex obtuse; inner lip three-plaited.

89. *CYTHARA GARRETTII*.

Shell fusiform, attenuated at both ends, longitudinally ribbed, ribs becoming nearly obsolete on body-whorl, transversely finely and closely striated, a deeply impressed line encircling the whorls just beneath the sutures. Colour white, variegated with reddish brown, which colour extends over the greater part of the body-whorl.

90. *CYTHARA VARIA*.

Shell fusiform, minute, attenuated at both ends, longitudinally ribbed. Colour variable, light brown with transverse lines of a darker colour encircling the whorls, or with longitudinal undulating lines, or ornamented with oblong square brown spots, or light brown dotted with white.

91. *CYTHARA PUSILLA*.

Shell oval, white, stained with purplish brown; whorls longitudinally ribbed, ribs somewhat oblique, striated transversely, whorls angulated at the sutures; outer and inner lip denticulated; spire short, outer lip thickened.

92. *DAPHNELLA BELLA*.

Shell fusiform; whorls angulated at the sutures, nodosely ribbed; body-whorl ribbed longitudinally somewhat obliquely, transversely finely striated. Colour yellowish brown, nodules white, ornamented with a row of dark brown spots between the interstices, encircling the whorls, and one following the sutures.

93. *DAPHNELLA INTERRUPTA*.

Shell elongate fusiform, thin, yellowish white, ornamented with transverse, interrupted, chestnut-brown lines transversely marked with interrupted granulose raised lines, finely striated longitudinally; aperture rather long; sinus deep.

94. *DAPHNELLA SANDWICENSIS*.

Shell ovate; spire short, smooth or obsoletely striated, slightly granulose at the sutures; aperture long, open, base subtruncate, white, stained with chestnut-brown; body-whorl ornamented with reticulated lines of same colour; apex reddish brown.

95. *DAPHNELLA MACULOSA*.

Shell elongate fusiform, transversely and longitudinally finely striated, giving the surface a granulose appearance; aperture long; base subtruncate. Colour white, ornamented with broad, interrupted longitudinal lines of a reddish brown.

## 7. CONTRIBUTIONS TO A KNOWLEDGE OF THE REPTILES OF THE HIMALAYA MOUNTAINS. BY DR. ALBERT GÜNTHER.

(Reptilia, Plates XXV., XXVI., XXVII., XXVIII.)

The following paper has been suggested by a collection of Reptiles made by MM. Hermann, Adolphe and Robert von Schlagintweit during their scientific mission to India and High Asia from 1854 to 1858, and submitted by those gentlemen to my examination. The value of the collection is highly increased by very accurate statements of the localities and altitudes at which each specimen was obtained, and which were kindly communicated to me for this paper. This is the first information of the kind we have received on the Reptiles of the Himalayas, and it is of the utmost importance, since it not only augments our knowledge of the vertical distribution of these animals, but embraces a larger number of facts, respecting the altitudes at which species of reptiles are known to exist in the different mountainous systems of the globe, than the whole of our previous information on the subject. I, however, have thought it advisable to take this opportunity of giving at once a complete list of the Reptiles known to inhabit the Himalayas, and to collect also those notes referring to them, which, if deficient in statements of the altitudes, yet give much information as to their horizontal distribution. In doing this, I have gathered my information from British collections and publications only, not finding the slightest data on the subject in foreign works treating of the physical history of these mountains. One of the chief resources for this list has been a collection made by Dr. J. Hooker in Sikkim and Khasia, partly described by Dr. J. E. Gray (Ann. and Mag. Nat. Hist. 1853, xii. p. 386), and partly by myself in my Catalogue of Colubrine Snakes. Finding a great congruity between the species obtained in the Khasia Hills and those collected by MM. von Schlagintweit at considerable altitudes in the Himalayas, I have not hesitated to admit the former into the list, although every other information on their habitat is wanting. But I have not admitted the numerous species mentioned by Dr. Cantor and others as being found in Assam; they were evidently col-

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B



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A. BARYCEPHALUS SYKESII, *Gthr.* B. TIARIS ELLIOTTI, *Gthr.*  
C. TILIIQUA SCHLEGELII, *Gthr.*

W. West, Imp.



lected in the plains of this country; and even those said to have been obtained from hills (their height is not stated) belong entirely to the lowland fauna. On the Reptiles inhabiting High Assam we have no information whatever. Another contribution to the Himalaya fauna has been given by Mr. Blyth in Journ. As. Soc. Beng. vols. xxii. and xxiii.\*, containing an account of several Reptiles from Nepal and Sikkim. Some of the latter have been found by Capt. Sherwill at Darjeeling, which locality is, as we know, 7100 feet above the level of the sea. Finally, Mr. Hodgson has sent numerous specimens from Nepal to the British Museum, but it is much to be regretted that he has not paid the same attention to their altitudinal distribution as he has done in the higher classes of Vertebrata; and I have been obliged to make a cautious selection from among the species sent by him, in order not to admit those which, although from Nepal, belong exclusively to the lowland fauna.

The collection of Messrs. von Schlagintweit is composed of 118 specimens, nearly all of which are in the best state of preservation; they have been transferred to the British Museum, together with the large Collection of the East India Company. A few only were collected in Ceylon, at Calcutta and Kurrachee, and are not mentioned in this paper, with the exception of one Snake from the latter place, which, with no other difference than a few very slight variations in the small additional shields of the head, so completely agrees with *Zamenis cliffordii* as to leave no doubt as to the identity of both. This species therefore appears to be found along all the coasts of North Africa through Egypt, and to extend to the banks of the Indus!

I shall first give the descriptions of the new species †.

### I. Descriptions of the New Species.

#### BARYCEPHALUS ‡, Gthr.

Head, body, and tail rather depressed, the latter tapering; tympanum circular; throat with a deep transverse fold; præanal or femoral pores none; head covered above with very small shields; back with very small square, keeled, and imbricate scales; sides granular, with scattered spines; belly with small square plates in transverse series; extremities and tail with oblique transverse series of strongly keeled scales; teeth laterally compressed, triangular, without lobes.

This genus is to be referred to the family of *Agamidae*.

\* I am very sorry not to have had earlier knowledge of this paper, which contains valuable detailed descriptions of numerous species. So much cannot be said of a herpetological paper by another author in the twenty-second volume of the Asiatic Journal, which, in its present shape, is of no value whatever to science.

† The discoverers of these Reptiles have requested me to dedicate the new species to gentlemen who have taken a particular interest in their travels.

‡ From *βαρυκέφαλος*, with depressed head.

## BARYCEPHALUS SYKESII, Gthr. (Pl. XXV. fig. A.)

*Diagnosis.*—Temple, sides of the throat and trunk, and the posterior part of the hind legs with scattered spines; a transverse series in the middle of the belly contains about fifty shields. Upper parts dusky, variegated and speckled with black, the lower parts whitish; throat reticulated with greenish.

The following specimens are in the Collection:—

- a. Adult. Simla, Himalaya; 2500 feet above level of the sea.
- b. Half-grown. Simla, Himalaya; 7200 feet above level of sea.
- c. Adult. Gärhvál, Himalaya; 8200 feet above level of the sea.
- d. Young. Balti, Tibet; 6100 feet above level of the sea.
- e. Half-grown. Ladak, Tibet; 15,250 feet above level of the sea.

*Description.*—The *head* is rather depressed and flat, with the canthus rostralis distinct, and with the snout of moderate length; it is covered above with numerous very small shields; there is a shield in the middle of the occipital region, which is rather larger than the others, but it is not present in all the specimens; a series of slightly keeled shields runs along the median line of the snout. The width of the space between the bony orbits is one-half that of the upper eyelid. The rostral shield is low, twice as broad as high; there are twelve upper labials. The nostril is in a single shield, which is situated between the canthus rostralis and the first upper labial. The loreal region is concave, and covered with minute shields. The median shield of the lower jaw is subpentagonal, and longer than broad; the lower labials are eleven in number, and higher than those of the upper lip; several other series of very small shields run parallel to that of the labials, the remainder of the throat being covered with minute granules. A low spiny crest proceeds from below the eye to the tympanum, the anterior circumference of which also is provided with spinous scales; several other groups of spines are between the tympanum and the fold of the throat, and on the sides of the neck, which is exceedingly finely granulated.

The *trunk* is depressed and flattened; the back is covered with small imbricate scales, each being provided with a strong keel; they gradually pass into the granulations of the sides, which, however, are intermixed with small scattered spines. The belly is covered with smooth square shields, arranged in transverse series; they are so small that I count fifty of them in one of the series in the middle of the belly.

The *tail* is considerably depressed at the base, assumes gradually a more conical form, and tapers posteriorly into a fine point; it is verticillated. The scales form rings, are quadrangular and strongly keeled, each keel terminating posteriorly in a small spine. The scales which are the largest and provided with the strongest keels are those on the anterior and superior parts of the extremities; the scales round the joints and on the posterior and inferior sides are smaller, and smooth. The fore leg reaches to the loin, if laid backwards; the third and fourth fingers are the longest, and equal in



length; the second and fifth are shorter, and equal each other in length; the first is the shortest. All the fingers and toes are slightly compressed and armed with strong claws. The hind leg reaches to the end of the snout, if laid forwards; the fourth toe is the longest, somewhat longer than the third and fifth, which are nearly equal; the second is considerably shorter, and the first is the shortest.

The ground-colour of the upper parts is dusky-brown or greenish-brown, the back being irregularly speckled with black; two of the specimens exhibit also some lighter, indistinct spots; the lower parts are whitish, the throat is reticulated with greenish; one specimen has the breast dotted with bluish-green.

	inches.	lines.
Total length .....	11	0
Length of the head (to the hinder edge of the tympanum) .....	1	0½
Greatest width of the head .....	0	9
Length of the trunk (to the anus) .....	3	0
——— of the tail .....	7	0
——— of the humerus .....	0	11
——— of the fore-arm .....	0	8½
——— of the fourth finger .....	0	7
——— of the first finger .....	0	4½
——— of the entire fore extremity .....	2	6
——— of the femur .....	1	1
——— of the lower leg .....	1	0
——— of the foot .....	1	3
——— of the fourth toe .....	0	10
——— of the fifth toe .....	0	8
——— of the first toe .....	0	4½
——— of the entire hinder extremity .....	3	4

This genus has a remarkable resemblance in many points to *Microphractus*\* (*Hopluridæ*), from the Andes; but there is a generic difference in the dentition. The species is named in honour of Colonel Sykes.

**TIARIS ELLIOTTI**, Gthr. (Pl. XXV. fig. B.)

*Diagnosis*.—Crest of the nape and of the back exceedingly low, formed by a series of larger keeled scales; neither a longitudinal nor a transverse gular fold; a very small detached tubercle behind the margin of the upper eyelid, which is not armed; a series of tubercles from above the tympanum, bent towards the nuchal crest. Above brownish, uniform or varied with darker.

*Hab.* Sikkim, Himalaya, One adult female specimen procured in an altitude of 9200 feet is in the Collection. Three other specimens, from the same country, have been presented to the British Museum by Dr. J. Hooker.

*Description*.—The head is rather high, with a sharp canthus rostralis, short snout, and convex upper eyelids; it is covered with

\* Cfr. *Proceed. Zool. Soc.* 1859, p. 90.

numerous slightly keeled scales, and one situated in the middle of the occiput appears to be rather larger than the others; the width of the space between the bony orbits is very narrow; the canthus rostralis and the margin of the upper eyelid form one continuous sharp edge. The rostral shield is very low, like the upper labials, which are five in number. The nostril is very small, in a single shield, which is situated between the canthus rostralis and the first labial. The loreal region is a little concave, and covered with small irregular shields. The median shield of the lower jaw is subtriangular and longer than broad; there are five lower labials on each side, the remainder of the throat being covered with imbricate and keeled scales. There is a small conical tubercle behind, and detached from the orbital edge; another similar tubercle is on each side of the throat below the tympanum; a series of tubercles proceeds from above the tympanum, and is bent inwards to the nuchal ridge. The tympanum itself is small and subcircular. There is no fold across the throat, but a transverse band of rather smaller scales.

The *trunk* is rounded, in the female depressed; a series of larger, keeled scales runs along the middle of the neck and back to the base of the tail, and forms a sort of dorsal crest; the back and the sides are covered with small scales of unequal size and quite irregularly arranged; they are intermixed with scattered, considerably larger scales, and these are distinctly keeled. The scales of the belly are imbricate, rhombic, more equal in size and more regularly arranged and slightly keeled; the præanal scales are like those of the belly; præanal pores none.

The *tail* is very long, slender, rounded at the base, and covered on all sides with rhombic, keeled, imbricate scales; it is not verticillated.

The upper parts of the extremities are covered with very large and strongly keeled scales; some scales on the hinder side of the femur have even two or three keels. The fore leg reaches to the loin, if laid backwards; the hind leg, if laid forwards, nearly to the end of the snout. The fingers and toes are armed with strong claws, and have the usual relative length. There are no femoral pores.

The ground-colour of the upper parts is brownish; uniform in the females, variegated with darker in the males. Some of the large scales of the back appear to have been iridescent during life. The lower parts are uniform dull-yellowish.

	inches.	lines.
Total length . . . . .	6	7½
Length of the head (to the tympanum) . . . . .	0	6½
Greatest width of the head . . . . .	0	5
Length of the trunk (to the anus) . . . . .	1	7
——— of the tail . . . . .	4	6
——— of the humerus . . . . .	0	4
——— of the fore-arm . . . . .	0	4
——— of the fourth finger . . . . .	0	4⅓
——— of the first finger . . . . .	0	1½
——— of the entire fore extremity . . . . .	1	0

	inches.	lines.
Length of the femur .....	0	6 $\frac{1}{3}$
— of the lower leg .....	0	5 $\frac{1}{3}$
— of the foot .....	0	3
— of the fourth toe .....	0	6
— of the fifth toe .....	0	4
— of the first toe .....	0	2
— of the entire hinder extremity .....	1	9

The species is dedicated to Walter Elliott, Esq., Member of the Council of Madras.

*TILQUA SCHLEGELII*, Gthr. (Pl. XXV. fig. C.)

*Diagnosis*.—Uniform black. Scales rather large, smooth, striated, not keeled, in four or five longitudinal series on the back. Four præanal shields, the two middle ones being the larger; a series of broad shields along the lower side of the tail. Ear-opening small, deep, round, with smooth margins.

*Hab.* Sikkim. One specimen, apparently not full-grown, has been found at an altitude of 8930 feet.

*Description*.—This species does not differ in general habit from the other *Tiliquæ*. Its snout is of moderate extent, and not produced. The series of shields covering the upper surface of the head is as follows:—1, the rostral shield is rounded; 2, the anterior frontal is single, subquadrangular, broader than long; 3, a pair of posterior frontals, which are not in contact with each other; 4, the vertical shield is quadrangular, with the anterior angle obtuse and the posterior very acute, and with the two anterior sides much shorter than the two posterior ones; the shield reaches backwards to the level of the pupil. 5. There are five superciliary shields on each side of the vertical; 6, five occipital shields, viz. an anterior pair, a single central one, and a posterior pair; the anterior pair form a suture with the vertical, separating it from the central occipital. The latter is quadrangular, similar in form to the vertical, but much shorter, so that the anterior pair of its sides are not much longer than the posterior. The anterior pair of the occipitals form together with the central shield a perfect square. The posterior pair is obliquely situated, subelliptical in form, and larger than any of the other occipitals; the inner side of those shields is in contact with an anterior and with the central occipital.

The nostril is in a single shield between the first labial and the anterior frontal; there are three shields between nostril and eye, covering the loreal region. Seven upper labials, the fifth of which is the largest, and extending upwards to the eyelid. The posterior part of the orbit is formed by three small shields, behind which are some large temporals. The median lower labial is broader than long, truncated posteriorly, forming a straight transverse suture with another single broad shield situated immediately behind the median labial. There are five narrow lower labials, with an interior series of five other much larger shields; the remainder of the throat

is covered with scales like the belly. The opening of the ear is small, round, and deep.

The scales are finely striated, without keels, and rather large on the back, whilst those on the belly are of moderate size, and those on the sides rather small. I count in the middle of the trunk five longitudinal series on the back, seven on each side, and six on the belly; so that that part of the body is surrounded by twenty-five series. There are four præanal shields, the middle pair being considerably the largest.

The greater portion of the tail is broken off; a band of broad shields begins to cover its lower side at a short distance from its origin; the tail is surrounded by eight series of scales, which exhibit no keel whatever. The tail itself is rounded, not compressed, and tapering.

The extremities are covered with scales similar to those of the body; the fore extremity reaches to the anterior margin of the eye, if laid forwards; the third and fourth fingers are the longest, and nearly equal; then follow the second, the fifth and the first. The length of the hinder extremity is rather more than one-half that of the trunk; the fourth toe is the longest; the third and fifth are equal in length, and the first is shorter than the second. All the fingers and toes are slightly compressed and well armed with claws.

The upper parts are uniform black, the lower ones blackish.

Palatine teeth none.

	inches.	lines.
Total length . . . . .	4	4
Length of the head (to the tympanum) . . . . .	0	4½
Greatest width of the head . . . . .	0	3
Length of the trunk (to the vent) . . . . .	1	6
——— of the tail (restored) . . . . .	2	6
——— of the fore extremity . . . . .	0	6
——— of the fourth finger . . . . .	0	1½
——— of the hinder extremity . . . . .	0	9½
——— of the fourth toe . . . . .	0	3

The species is called after Prof. H. Schlegel of Leyden.

#### ABLABES RAPPPII, Gthr. (Pl. XXVI. fig. B.)

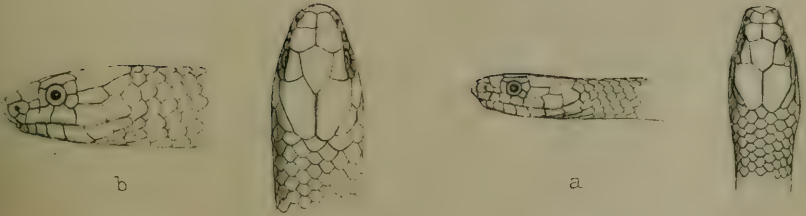
*Diagnosis.*—Scales in fifteen rows; six upper labials, the third and fourth of which enter the orbit. Above uniform blackish; below yellowish.

*Hab.* Sikkim (5340 feet above the level of the sea). Another specimen, sent by Mr. Hodgson from Nepal, and rather injured, is in the Collection of the British Museum.

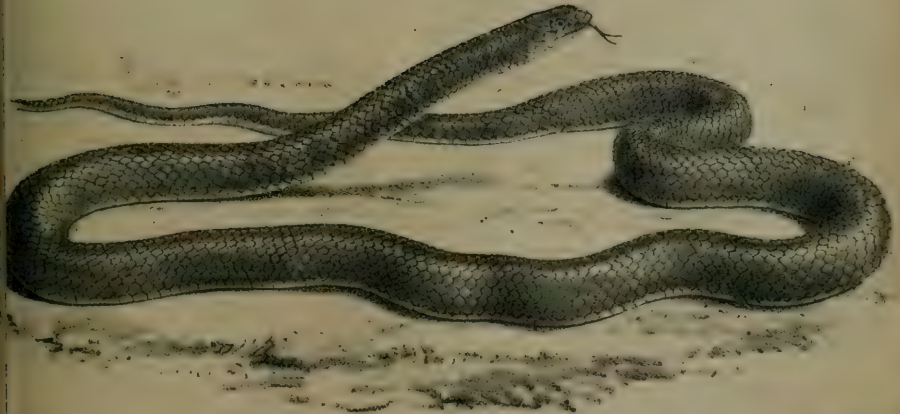
*Description.*—The head is of moderate length, and continuous with the neck; the body and tail are rather slender. The rostral is a little broader than high, rounded superiorly, and reaching to the upper surface of the head. The anterior frontals are smaller than the posterior ones, which are bent downwards to the side of the head. The vertical is not twice as long as broad, and has the posterior



A.



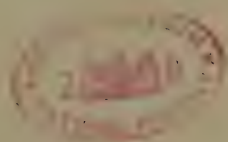
B.



A. a. ABLABES OWENII, Gthr.  
B b. \_\_\_\_\_ RAPPIN, Gthr.

W West 1849

H Ford



angle pointed in the specimen from Sikkim, and obtuse in those from Nepal. The occipitals are of moderate extent. The nostril is between two shields; one loreal, one anterior and two posterior oculars; six upper labials, the third and fourth of which enter the orbit; two temporals, one behind the other, the anterior elongate; seven lower labials, those of the first pair forming a suture behind the triangular median shield; two pairs of chin-shields, those of the anterior pair being the largest.

The scales are rhombic, perfectly smooth, in fifteen rows in the middle of the body; anals and subcaudals bifid.

Sikkim specimen: ventrals 191, subcaudals 60.

Nepalese specimen: ventrals 198.

The colour has been described above. The teeth are small, equal, smooth. The specimen from Sikkim is an adult female with mature eggs in the oviduct; its total length is  $16\frac{1}{2}$  inches, the length of the head  $4\frac{1}{2}$  lines, that of the tail  $3\frac{1}{2}$  inches.

The species is called after Prof. von Rapp, of Tübingen.

**ABLABES OWENII**, Gthr. (Pl. XXVI. fig. A.)

*Diagnosis*.—Scales in fifteen rows; six upper labials, the third and fourth of which enter the orbit. Greyish-brown, with a broad black collar and many black transverse spots on the anterior part of the body.

*Hab.* Sikkim, Himalaya (10,200 feet above the level of the sea).

*Description*.—The head is of moderate length, flat and depressed, not distinct from the neck; the snout is rather broad; the rostral much broader than high, and not extending backwards on the upper surface of the head. The frontals are broader than long, the anterior ones half the size of the posterior, which are bent downwards on the side of the head. The vertical is pentagonal, with the anterior margin convex and equal in length to the lateral one, and with the posterior angle pointed. The occipitals are of moderate extent and rounded posteriorly. The nostril is between two shields. One loreal, one anterior, and two posterior oculars; six upper labials. There are two narrow temporal shields of nearly equal length, one behind the other. Six lower labials, those of the first pair forming a suture together behind the median shield, which is triangular and longer than broad. The two pairs of chin-shields are of equal size. The trunk is rounded, of moderate length, surrounded by fifteen rows of rhombic, perfectly smooth scales. Ventrals 200, anal bifid; subcaudals 59. The upper parts are greyish-brown; there is a broad black collar immediately behind the occipitals, and not extending on to the abdominal side; the anterior portion of the trunk exhibits many narrow and rather irregular black transverse spots, gradually disappearing towards the middle of the length of the body. The lower parts are uniform yellowish.

	inches.	lines.
Total length . . . . .	7	9
Length of the head . . . . .	0	$3\frac{1}{2}$
— of the tail . . . . .	1	4

This species is called in honour of Prof. Richard Owen.

*SPILOTES HODGSONII*, Gthr. (Pl. XXVII.)

*Diagnosis*.—Body elongate, slightly compressed. Scales indistinctly keeled, in twenty-three rows; the fifth upper labial shield hardly reaching upwards to the posterior margin of the orbit; eight upper labials, two posterior oculars, anal bifid. Uniform olive, the skin between the scales black.

*Hab.* Ladak, Tibet (15,200 feet above the level of the sea). Two other specimens have been sent by Mr. Hodgson from Nepal.

*Description*.—This species is closely allied to *Spilotes melanurus*, Schleg., and *Sp. reticularis*, Cant., which, however, have considerably larger scales, in nineteen, and sometimes in twenty-one series, and exhibit a different coloration. *Sp. melanurus* has the sixth (fifth) upper labial differently shaped; but in all have the shields of the head the same tendency to irregularities, two or three being often united. This is the case in the Nepalese specimens of the present species, whilst that from Tibet has all distinctly separated. The form of the head and of its shields is exactly the same as in the other species mentioned. The ante-ocular reaches to the upper surface of the head, without touching the vertical. The scales are small, especially those on the neck, where they are arranged in twenty-three rows, as in the middle of the body. Those of the dorsal series are indistinctly keeled.

	Ventrals.	Anal.	Caudals.
Tibetan specimen . . . . .	256	1/1	90
Nepalese specimen, no. 1 . . . . .	226	1/1	79
Nepalese specimen, no. 2 . . . . .	233	1/1	85

The colour of the upper parts is uniform olive, the skin between the scales being black; the belly is whitish, and the margin of each ventral shield blackish on each side. The tail is coloured like the body.

	inches. lines.	
Length of the head . . . . .	1	2
— of the tail . . . . .	11	0
Total length . . . . .	51	0

This Snake is called after B. H. Hodgson, Esq.

HERPETOREAS, Gthr.

*Diagnosis*.—The posterior maxillary tooth longest, in a continuous series with the anterior ones. Body and tail slender, compressed. Two nasals, one loreal, one anterior, two posterior oculars. Scales moderately elongate, keeled, in nineteen rows. Eye of moderate size.

This genus is to be referred to the family of the *Dryadidae*, and is distinguished from the other genera by its dentition.

HERPETOREAS SIEBOLDII, Gthr.

*Diagnosis*.—Vertical shield five-sided, with the lateral margins nearly parallel, and with the posterior sides very short. Scales in





W West amp

SPIROTES HODGSONII, Gthr

C.H Ford



nineteen rows, slightly keeled. Above uniform greenish-brown; below yellowish, with a darker stripe on each side, formed by short streaks.

*Hab.* Sikkim, Himalaya (7500 feet above the level of the sea).

*Description.*—Although the head of the single specimen sent is somewhat injured, and does not admit of a fully detailed description, I do not hesitate to found a new genus and species on it, as those parts which are in a better state of preservation exhibit peculiarities sufficient for its recognition. From some few remarks made by Mr. Blyth in Journ. As. Soc. 1855, p. 292, it would appear that he also has seen this Snake. He, however, describes it as having seventeen rows, and applies to it the name of *Herpetodryas helena*, Daud., which is entirely incorrect, the Snake of Daudin being a common species from Ceylon with twenty-seven rows of scales (*Cynophis helena*).

The head is somewhat elongate, rounded in front and flat above. The rostral shield is broader than high, and rounded superiorly; the anterior frontals are pentagonal, one-half the size of the posterior, which are bent downwards on the side of the head. The vertical is pentagonal, much broader than the superciliary, and not quite twice as long as broad; its lateral margins are nearly parallel, the posterior ones very short, and meeting at a right angle. The occipitals are slightly elongate and rather narrow, subtruncated posteriorly. Nostril between two plates; one loreal, one anterior, and two posterior oculars; eight upper labials, the third, fourth, and fifth of which enter the orbit. There appear to be five temporal shields. Ten lower labials, those of the first pair being in contact with each other, behind the median shield, which has the posterior margin obtusely rounded. Two pairs of chin-shields, the anterior being the smaller.

The trunk is compressed, especially towards the tail, and slender; it is surrounded by nineteen series of scales, those of the back being slightly keeled; they are rather elongate, and assume a rhombic form towards the tail. The ventral and subcaudal plates are bent upwards to the sides, but not keeled. Ventrals 216, anal bifid, caudals 90.

The two posterior teeth are twice as long as the anteriors, with which they form a continuous series; they are not grooved. The upper parts are uniform greenish-brown, the lower ones yellowish; the ventrals have an elongate spot on each side. Total length 3 feet 1 inch; length of the head 10 lines, of the tail 9 inches.

This species is called after Prof. von Siebold of Munich.

#### RANA LIEBIGII, Gthr. (Pl. XXVIII. fig. A.)

*Diagnosis.*—Tympanum hidden; a strong tubercular fold from the eye to the axil, another along each side of the back; sacral region tubercular. Head broad; muzzle obtuse, with the canthus rostralis flattened. A slight groove across the occiput, uniting both the posterior angles of the eye-lids. Vomerine teeth in two oblique series, convergent posteriorly. The fifth toe not quite one-third the

length of the third and fourth. Metatarsus with one tubercle. Tips of the fingers and toes truncated. (Brown, a dark streak along the canthus rostralis; the hinder side of the thigh with white spots; the lower parts brown, or whitish marbled with brown.

*Hab.* One specimen, found by Messrs. von Schlagintweit in Sikim (3800 feet); another from Nepal is in the Collection of the British Museum.

*Description.*—The upper surface of the head is flat, with indistinct canthus rostralis; the loreal region is oblique, the snout short and broad, the distance between the angles of the mouth being very much more than the length of the head. The tympanum is hidden by the skin, but its outlines become somewhat visible in exsiccated specimens only; the species may be readily distinguished by this character. The nostril is situated midway between the eye and the end of the snout. The eye is of moderate size, prominent above the level of the crown, and with a slight groove behind. The space between the eyes is as wide as an upper eyelid. The inner nostrils are a rather narrow transverse cleft, and in size about equal to the openings of the eustachian tubes. The lower jaw without prominences; there are no vocal sacs, both the specimens being females. Two tubercular folds arise from the eye; the stronger one running above the tympanum to the axil, the other along the side of the back towards the loin; the back and the belly are smooth; the sacral region, the sides of the body, and the upper parts of the thigh are more or less covered with broad tubercles. The toes and fingers are truncated or ending in small knobs. The former are webbed to their extremities, the membrane being slightly emarginate. The fourth toe is one-fourth longer than the third, which is rather longer than the fifth. One metatarsal tubercle. The colours have been stated above.

	inches.	lines.
Length of head and body . . . . .	3	9
— of the head . . . . .	1	2
Width of the head . . . . .	1	5
Length of the fore leg . . . . .	2	1
— of the hind leg . . . . .	6	0
— of the fifth toe . . . . .	1	4
— of the fourth toe . . . . .	1	8
— of the third toe . . . . .	1	5

This species is called after Dr. von Liebig, jun.

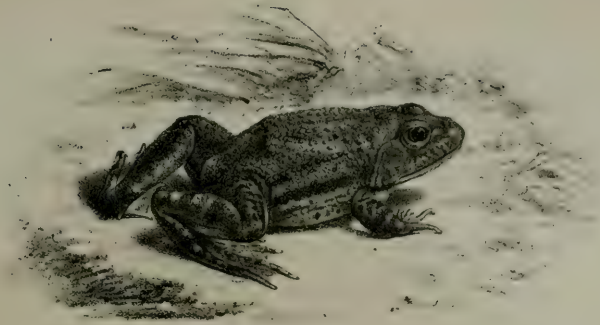
#### DICROGLOSSUS, Gthr.

Fingers free, toes broadly webbed; tongue rather elongate, deeply notched behind; vomerine teeth none; eustachian tubes moderate, tympanum indistinct; vocal sacs of the male external and lateral.

This genus is to be referred to the *Ranidæ*, and differs from *Oxyglossus* in the shape of the tongue.

DICROGLOSSUS ADOLFI, Gthr. (Pl. XXVIII. fig. B.)

*Diagnosis.*—Skin smooth or warty; toes webbed to their tips by



B.



A



Aa. *Rana liebigii*, Gchr. B.b *Dicroglossus adolfi*, Gchr



a very extensible membrane; a cylindrical tubercle at the metatarsus, very much like the rudiment of a sixth toe. Above greenish or greenish-brown, uniform or spotted with darker; belly with dark specks. Size of *Bombinator igneus*.

*Hab.* Kulu and Simla, Himalaya (2400–4200 feet above the level of the sea).

*Description.*—In habit and size somewhat similar to *Bombinator igneus*, but with the snout more pointed. The skin is in some specimens warty, in others smooth. The tympanum is rather indistinct, and not quite of the size of the eye. The inner nostrils are small and rather distant from each other, the openings of the eustachian tubes larger. The extremities are of moderate length; the fingers quite free: the third is the longest; the first is very little longer than the second and fourth, which are equal in length. The structure of the hind foot is similar to that in *Oxyglossus*; but the tubercle of the metatarsus is very much like a rudiment of a sixth toe. The fourth toe is one-fourth longer than the fifth. The species varies considerably in coloration, and the most constant characters appear to be brownish specks on all or some of the lower parts, and a brownish streak on the hinder side of the thigh.

	inches.	lines.
Length of the head and body .....	1	7
——— of the fore leg .....	0	10
——— of the hind leg .....	2	4

I have dedicated this species to the memory of the late Adolphe von Schlagintweit.

## II. List of Himalayan Reptiles, with Remarks on their Horizontal Distribution.

Those species which, although they extend into the mountainous regions, are not peculiar to the Himalaya fauna, are marked with an asterisk.

### CHELONIÆ.

#### 1. EMYDA PUNCTATA, Lacép.

Found by MM. von Schlagintweit in Sikkim.

### SAURIA.

#### \*1. EMPAGUSIA FLAVESCENS, Gray, Catal. Liz.

Sent by Mr. Hodgson from Nepal. I strongly suspect this species to belong to the fauna of the lowlands.

#### 2. HINULIA INDICA, Gray, Ann. & Mag.

Found by Dr. Hooker in Sikkim, by Messrs. von Schlagintweit in Sikkim, Garhwal, Simla, Kashmir, and in Ladak, Tibet.

3. *MOCOA SIKKIMENSIS*, Blyth, Journ. As. Soc.  
Found by Capt. Sherwill in Sikkim.
4. *PLESTIODON SIKKIMENSIS*, Gray, Ann. & Mag.  
Found by Dr. Hooker in Sikkim.
- \*5. *VARANUS HERALDICUS*, Gray, Catal. Liz.  
Sent by Mr. Hodgson from Nepal.
6. *DOPASIA GRACILIS*, Gray, Catal. Liz. & Ann. & Mag.  
Found by Dr. Hooker in the Khasia Hills.
- \*7. *TILIQUA RUFESCENS*, Shaw (Gray, Catal. Liz. & Ann. & Mag.).  
Found by Mr. Hodgson in Nepal, by Dr. Hooker and Messrs. v. Schlagintweit in Sikkim.
8. *TILIQUA SCHLEGELII*, Gthr.  
Found by Messrs. v. Schlagintweit in Sikkim.
9. *ARGYROPHIS HORSFIELDII*, Gray, Catal. Liz.  
Khasia Hills.
10. *BIANCIA NIGRA*, Gray, Ann. & Mag.  
Found by Dr. Hooker and Messrs. v. Schlagintweit in Sikkim.
11. *CALOTES MARIÆ*, Gray, Catal. Liz. & Ann. & Mag.  
Found by Dr. Hooker in the Khasia Hills, and by Messrs. v. Schlagintweit in Jamu, Himalaya.
12. *CALOTES TRICARINATUS*, Blyth, Journ. As. Soc. Beng. 1854, p. 650.  
Found by Capt. Sherwill at Darjiling.
- \*13. *CALOTES VERSICOLOR*, Daud. (Gray, Catal. Liz.).  
Found by Mr. Hodgson in Nepal, and by Messrs. v. Schlagintweit in Jamu and Simla (Himalaya).
14. *CALOTES MINOR*, Gray.  
Stated by Dr. Gray (Catal. Liz.) to come from the Khasia Hills; found by Messrs. v. Schlagintweit in Sikkim.
15. *TIARIS ELLIOTTI*, Gthr.  
Found by Dr. Hooker and Messrs. v. Schlagintweit in Sikkim.
16. *IPALURA VARIEGATA*, Gray, Ann. & Mag.  
Found by Dr. Hooker in Sikkim.



## 17. PHRYNOCEPHALUS TICKELII, Gray.

Found by Messrs. v. Schlagintweit in Tibet. The black bands round the tail are not always present.

## \*18. UROMASTIX GRISEUS, Cuv.

Found by Messrs. v. Schlagintweit in Sikkim.

## 19. BARYCEPHALUS SYKESII, Gthr.

Found by Messrs. v. Schlagintweit at Simla and Garhval (Himalaya), and in Balti and Ladak (Tibet).

## OPHIDIA.

1. BRACHYORRHOS TENUICEPS (*Calamaria tenuiceps*, Blyth, Journ. As. Soc. Beng. 1855, p. 288).

Found by Capt. Sherwill at Darjiling.

\*2. SIMOTES RUSSELLII, Daud. (Gthr. Catal. Colubr. Snakes).

Found by Mr. Hodgson in Nepal.

\*3. SIMOTES PURPURASCENS, Schleg. (var. D. & E. Gthr. Catal. Colubr. Snakes = *Coronella puncticulata*, Gray, Ann. & Mag.).

Found by Dr. Hooker in Khasia, by Messrs. v. Schlagintweit in Sikkim, and by Mr. Hodgson in Nepal.

\*4. ABLABES COLLARIS (*Psammodphis collaris*, Gray, l. c.; Gthr. Catal. Col. Snakes).

Found by Dr. Hooker and Messrs. v. Schlagintweit in Khasia, and by Mr. Hodgson in Nepal.

5. ABLABES RAPPII, Gthr.

Found by Messrs. v. Schlagintweit in Sikkim.

6. ABLABES OWENII, Gthr.

Found by Messrs. v. Schlagintweit in Sikkim.

7. TRACHISCHIUM FUSCUM (*Calamaria fusca*, Blyth, Journ. As. Soc. Beng. = *Trachischium rugosum*, Gthr. Catal. Col. Sn.).

Found by Dr. Hooker, Capt. Sherwill, and Messrs. v. Schlagintweit in Sikkim; by Mr. Hodgson in Nepal.

8. TRACHISCHIUM OBSCURO-STRIATUM (*Calamaria obscuro-striata*, Blyth, Journ. As. Soc. Beng.).

Found by Messrs. v. Schlagintweit in Sikkim; described by Mr. Blyth from specimens from Rangoon.

9. XENODON MACROPHthalmus, Gthr. (Catal. Col. Sn.).

Found by Dr. Hooker in Khasia and Sikkim (4000 feet). *Tro-*  
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*pidonotus macrops*, Blyth (Journ. As. Soc. Beng. xxiii. p. 296), found by Capt. Sherwill at Darjiling, appears to be closely allied to, if not identical with, *X. macrophthalmus*.

\*10. *TROPIDONOTUS QUINCUNCIATUS*, Schleg. (Gthr. Catal. Col. Sn.).

Found by Dr. Hooker in Sikkim, by Messrs. v. Schlagintweit in the Himalaya and Cashmere. The variety *T. umbratus* has been procured by Mr. Hodgson in Nepal, and by Messrs. v. Schlagintweit in Sikkim.

\*11. *TROPIDONOTUS STOLATUS*, L. (Gray, Ann. & Mag.; Gthr. Catal. Col. Sn.).

Found by Mr. Hodgson in Nepal, by Dr. Hooker in Khasia, and by Messrs. v. Schlagintweit in the Himalaya.

\*12. *TROPIDONOTUS SUBMINIATUS*, Reinw. (Gthr. Catal. Col. Sn.).

Found by Dr. Hooker in Sikkim, by Messrs. v. Schlagintweit in Jamu, Himalaya.

\*13. *TROPIDONOTUS CHRYSARGUS*, Boie (Gthr. Catal. Col. Sn.).  
Sent by Mr. Hodgson from Nepal.

14. *TROPIDONOTUS PLATYCEPS*, Blyth, *l. c.* p. 297.

Found by Dr. Hooker in Khasia, by Capt. Sherwill and Messrs. v. Schlagintweit in Sikkim, by Mr. Hodgson in Nepal. This species has the teeth of the genus *Amphiesma*, D. & B., and varies very much in coloration according to age and sex; but it constantly shows a dark stripe through the eye, and a black vertical streak on the rostral shield. I have found the eggs of a Lizard or of another Snake in the stomach of one of the specimens.

\*15. *TROPIDONOTUS CERASOGASTER*, Cant. (Gthr. Catal. Col. Sn.).

Found by Dr. Hooker in Khasia.

16. *TROPIDONOTUS (?) DIPSAS*, Blyth, *l. c.* p. 297.

Found by Capt. Sherwill at Darjiling.

17. *COLUBER CALLICEPHALUS* (*Coronella callicephalus*, Gray, *l. c.*).

Found by Dr. Hooker in Khasia.

\*18. *SPILOTES RADIATUS*, Reinw. (Gray, Ann. & Mag.; Blyth, Journ. As. Soc. Beng.).

Found by Dr. Hooker in Khasia, and by Capt. Sherwill in Sikkim.

\*19. *SPILOTES MELANURUS*, Schleg. (Gthr. Catal. Col. Sn.).  
Sent by Mr. Hodgson from Nepal.

20. *SPILOTES HODGSONII*, Gthr.

Sent by Mr. Hodgson from Nepal, and found by Messrs. v. Schlagintweit at Ladak (Tibet).

21. *SPILOTES RETICULARIS*, Cant. (Gthr. Cat. Col. Sn.).

Found by Dr. Hooker in Khasia, by Messrs. Schlagintweit in Sikkim, by Mr. Hodgson in Nepal.

\*22. *CORYPHODON FASCIOLATUS*, Shaw (Blyth, Journ. As. Soc. Beng.).

Found by Capt. Sherwill at Darjiling.

\*23. *CORYPHODON BLUMENBACHII*, Merr. (Gthr. Catal. Col. Sn.).

Found by Mr. Hodgson in Nepal, and by Messrs. v. Schlagintweit in Sikkim.

\*24. *CORYPHODON KORROS*, Reinw. (Blyth, Journ. As. Soc. Beng.).

Found by Capt. Sherwill at Darjiling.

25. *CORYPHODON CARINATUS*, Gthr. *l. c.* = *Coluber nigro-marginatus*, Blyth, *l. c.* p. 290 = *Coluber dhumnades*, Cant.

Found by Dr. Hooker in Khasia and Sikkim, by Capt. Sherwill and Messrs. v. Schlagintweit in Sikkim, and by Mr. Hodgson in Nepal. When naming this Snake *C. carinatus*, I was well aware of its identity with *C. dhumnades*; but I intended to point out that it stands in the same relation to *Coryphodon fuscus* as *Herpetodryas carinatus* does to *H. fuscus*.

26. *HERPETOREAS SIEBOLDII*, Gthr.

Found by Messrs. v. Schlagintweit in Sikkim.

27. *GONYOSOMA FRENATUM* (*Herpetodryas frenatus*, Gray, Ann. & Mag.).

Found by Dr. Hooker in Khasia.

\*28. *PSAMMODYNASTES PULVERULENTUS*, Boie (Gthr. Cat. Col. Sn. = *Dipsas ferruginea*, Cant. Proc. Zool. Soc. 1839, p. 53; Blyth, Journ. As. Soc. Beng.).

Found by Dr. Hooker in Khasia, by Capt. Sherwill and Messrs. v. Schlagintweit in Sikkim.

\*29. *DENDROPHIS PICTA*, Gm. (Gthr. Cat. Col. Sn.).

Found by Dr. Hooker in Khasia.

30. *DIPSADOMORPHUS TRIGONATUS*, Schneid.

Found by Messrs. v. Schlagintweit in the Himalaya.

\*31. *LYCODON AULICUS*, L. (Gthr. Cat. Col. Sn.).

Sent by Mr. Hodgson from Nepal; found by Messrs. v. Schlagintweit in the Himalaya (2400 feet).

32. *ELAPS UNIVIRGATUS*, Gthr. *l. c.*

Sent by Mr. Hodgson from Nepal.

33. *PARIAS MACULATA*, Gray, *l. c.* (Gthr. Cat. Col. Sn. p. 266, where the specimens are referred, by mistake, to *Trimesurus maculatus*).

Found by Dr. Hooker in Sikkim, and sent by Mr. Hodgson from Nepal.

34. *TRIGONOCEPHALUS AFFINIS*, Gray.

Found by Messrs. v. Schlagintweit in Tibet.

\*35. *DABOIA ELEGANS*, Daud.

Found by Messrs. v. Schlagintweit in Kulu, Himalaya.

36. *TRIMESURUS BICOLOR*, Gray, *l. c.*

Found by Dr. Hooker in Khasia.

37. *TRIMESURUS ELEGANS*, Gray, *l. c.*

Found by Dr. Hooker in Khasia.

\*38. *NAJA TRIPUDIANS*, Merr.

Found by Messrs. v. Schlagintweit in Sikkim. The specimens are uniform black, or with white cross-bands.

\*39. *GONGYLOPHIS CONICUS*, Schneid.

Found by Messrs. v. Schlagintweit in Sikkim.

\*40. *CLOTHONIA JOHNII*, Gray.

Found by Messrs. v. Schlagintweit in Sikkim.

## BATRACHIA.

1. *DICROGLOSSUS ADOLFI*, Gthr.

Found by Messrs. v. Schlagintweit in Kulu and Simla, Himalaya.

\*2. *RANA TIGRINA*, Daud. (Gthr. Catal. Batr.).

Found by Mr. Hodgson in Nepal, by Messrs. v. Schlagintweit in Sikkim.

\*3. *RANA VITTIGERA*, Wieg.

Found by Messrs. v. Schlagintweit in Jamu, Himalaya.

## 4. RANA LIEBIGII, Gthr.

Found by Messrs. v. Schlagintweit in Sikkim, and sent by Mr. Hodgson from Nepal.

## \*5. TOMOPTERNA STRIGATA, Gthr.

Found by Messrs. v. Schlagintweit at Simla, Himalaya. This species has been described and figured in the Catal. Batr. Sal. p. 20. pl. 2. f. A, under the name of *Sphærotheca strigata*, from specimens in the British Museum, transmitted by Mr. Jerdon from Madras. When, however, during the printing of that catalogue, Sir Andrew Smith presented his collection of Reptiles to the British Museum, I found in it specimens of a Frog, identical with *Sphærotheca strigata*, labelled "*Tomopterna delalandii*, Cape," in Sir A. Smith's own hand. I did not venture to doubt such an authority for the reptiles of South Africa, and accordingly placed in the Appendix, p. 133, the new name as a synonym of the older. But the fact of the species now having been found by Messrs. v. Schlagintweit in the Himalaya, leaves us no other alternative than to suppose either that the species occurs in South Africa as well as in the East Indies (which is improbable in the highest degree), or that Sir A. Smith, who has collected reptiles from all parts of the globe, has mistaken the origin of his specimens. *Sphærotheca strigata* has, indeed, a great resemblance to *Tomopterna delalandii*; but it is evident, from a specimen of the latter which I have lately examined, that both differ in the form of the occiput, which is singularly convex and rounded in the former, whilst it is flat in the African species. This character is not sufficient to found a separate genus on it, and *Sphærotheca strigata*, therefore, is to be referred to *Tomopterna*.

6. MEGALOPHRYS GIGAS, Blyth, Journ. As. Soc. Beng. 1855, p. 299.

From Sikkim.

## \*7. BUFO VULGARIS, Laur.

Found by Messrs. v. Schlagintweit in Sikkim and Balti, Tibet.

## \*8. BUFO MELANOSTICTUS, Schneid. (Gthr. Catal. Batr.).

Found by Dr. Hooker and Messrs. v. Schlagintweit in Sikkim, by Mr. Hodgson in Nepal.

9. BOMBINATOR (?) SIKKIMMENSIS, Blyth, *l. c.* p. 300.

From Sikkim.

## \*10. POLYPEDATES MACULATUS, Gray.

Found by Messrs. v. Schlagintweit in Sikkim.

11. RHACOPHORUS MAXIMUS, Gthr. *l. c.*

Found by Mr. Hodgson in Nepal, and by Messrs. v. Schlagintweit in Sikkim.

12. *ICHTHYOPHIS GLUTINOSUS*, L. (Gray, *l. c.*).

Found by Dr. Hooker in Khasia.

I am well aware that the results of our examination rest on facts which, for the present, depend on isolated, and therefore necessarily incomplete, observations; and cautiously as the conclusions may be drawn, yet they will undergo, perhaps, considerable alterations, when some future traveller or resident devotes as much attention to this part of zoology as has been given to other branches and to botany. With regard to *horizontal distribution*, the first question is, whether the Reptiles of the Khasia Hills show such a degree of identity with those of the Himalayas as to compel us to refer them to the same fauna; our knowledge of the Reptiles of High Assam being too scanty to admit of any conclusion as to that country. Now, two of the four species of Khasian Saurians are found also in the Himalayas and in Afghanistan, but nowhere else (*Calotes mariae* and *C. minor*). The order of Ophidians offers us more facts. Dr. J. Hooker was able to collect fifteen species of Snakes during a twelve months' sojourn in Khasia. He says\* that they are very common there, whilst he found them rare and shy in most parts of the Himalaya†. In this, however, he appears to be right merely with regard to the number of individuals, the Himalaya showing an absolutely greater variety in generic and specific forms; and the difference mentioned by Dr. Hooker may depend on the influence of the climate which, in Khasia, is remarkable for the extensive rainfall, the annual average probably greatly exceeding 600 inches‡, whilst 136 only are recorded at Darjeeling. Three of these fifteen species (*Gonyosoma frenatum*, *Trimesurus elegans*, and *T. bicolor*) are known from Khasian specimens only; five are very distinct varieties and species, confined to Khasia and the Himalaya, and not descending below 4000 feet in the latter (*Simotes purpurascens*, var., *Xenodon macrophthalmus*, *Tropid. platyceps*, *Spilotes reticulatus*, *Psammod. pulverulentus*, var.). The remainder are found in the plains also, but they ascend the Khasia Hills, as well as the Himalayas, far enough to be admitted into their fauna. Thus we find in these facts evidence enough to show not only a great similarity, but a real unity of the two faunas, extending westwards along all the chains of the Himalayas; and there are not a few Khasian and Himalayan species which are found in Afghanistan.

When we come to examine the highest zone of the Himalaya in which reptiles can live, we find its Amphibio-fauna mixed with forms bearing the Palæartic character. This appears to be not only the effect of a climate tempered by the great vertical elevation, but the natural consequence of the connexion between the northern Himalaya and Central Asia, or, in other words, a fact of the horizontal distri-

\* Himal. Journ. ii. p. 301. Dr. Hooker is mistaken in believing that none of the Snakes collected by him in Khasia are venomous. *Trimesurus bicolor* and *T. elegans* were described from his collection. See Ann. & Mag. *l. c.* pp. 391, 392.

† Himal. Journ. ii. p. 49.

‡ Himal. Journ. ii. p. 283.

bution of animals. Forms belonging to the Palæarctic fauna extend from the north into the mountains, as the Indian species do from the south, and we may infer that there exists a great difference between the reptiles inhabiting the northern parts of the Himalayas and those found on its southern slope;—a difference, which, for the present, is merely pointed at by *Phrynocephalus tickelii*, *Trigonocephalus affinis* and *Bufo vulgaris*, obtained by MM. von Schlagintweit in Tibet. The Himalayas, situated on the border between the Palæarctic and the Indian regions, offer the same variations in their fauna as the Sahara, which separates the Palæarctic region from the Æthiopian.

III. *List of Himalayan Reptiles according to their Altitudinal Distribution, and Remarks on it.*

*Chelonia.*

Feet above the level of the sea.

*Emyda punctata* . . . . . 2100

*Sauria.*

*Phrynocephalus tickelii* . . . . . 15,200—15,300

*Hinulia indica* . . . . . 5800—15,250

*Barycephalus sykesii* . . . . . 2500—15,250

*Biancia nigra* . . . . . 11,200

*Calotes minor* . . . . . 11,100

*Tiliqua rufescens* . . . . . 0—9560

*Tiaris elliotti* . . . . . 9200

*Calotes tricarinatus* . . . . . 7100

— *mariae* . . . . . 3900

— *versicolor* . . . . . 0—3400

*Gecko verus* . . . . . 0—1600

*Uromastix griseus* . . . . . 0—1500

*Ophidia.*

*Spilotes hodgsonii* . . . . . 15,200

*Ablabes owenii* . . . . . 10,200

*Clothonia johnii* . . . . . 0—9800

*Trigonocephalus affinis* . . . . . 9000

*Tropidonotus platyceps* . . . . . 4100—9000

*Trachischium fuscum* . . . . . 7100—8500

*Tropidonotus subminiatus* . . . . . 0—8200

*Naja tripudians* . . . . . 0—8000

*Herpetoreas sieboldii* . . . . . 7500

*Trachischium obscuro-striatum* . . . . . 7400

*Psammodynastes pulverulentus* (var.) . . . . . 0—7250

*Brachyorrhos tenuiceps* . . . . . 7100

*Xenodon macrophthalmus* . . . . . 4000—7100

*Spilotes reticularis* . . . . . 4220—6900

*Coryphodon carinatus* . . . . . 5700—7100

*Dipsas trigonata* . . . . . 0—6200

*Simotes purpurascens* . . . . . 0—6040

	Feet above the level of the sea.
<i>Ablabes rappii</i> .....	5340
<i>Coryphodon blumenbachii</i> .....	0—5240
<i>Gongylophis conicus</i> .....	0—1900
<i>Simotes russellii</i> .....	0—4100
<i>Tropidonotus quincunciatus</i> .....	0—3950
<i>Ablabes collaris</i> .....	0—3400
<i>Daboia elegans</i> .....	0—3400
<i>Tropidonotus stolatus</i> .....	0—3310
<i>Lycodon aulicus</i> .....	0—2400

*Batrachia.*

<i>Bufo vulgaris</i> .....	5900—10,200
— <i>melanostictus</i> .....	0—9000
<i>Rhacophorus maximus</i> .....	5200
<i>Rana vittigera</i> .....	0—4900
<i>Tomopterna strigata</i> .....	(0 ?—) 4700
<i>Dicroglossus adolfi</i> .....	2404—4200
<i>Rana liebigii</i> .....	3800
<i>Polypedates maculatus</i> .....	0—2780
<i>Rana tigrina</i> .....	0—1900

It is not to be wondered at that we do not find any Crocodilian in our lists, as those animals prefer the damp and hot climate of the lowlands, with the flat and level banks of slowly moving rivers and streams; but we should have expected to find several species of Tortoises extending upwards to the subtropical zone. Yet neither Dr. Hooker nor Mr. Blyth mentions their occurrence\*, and the single specimen of *Emyda punctata* in the collection of MM. von Schlagintweit is, at present, the only known representative of this order in the Himalayas. The absence of Crocodiles and the scarcity of Tortoises appear to distinguish the outer Himalayas from the plains.

The ratio of the numerical distribution through the various altitudes is different in the different orders of Reptiles. Whilst the number of the species of Lizards (strangely enough) does not decrease between 1000 and 15,000 feet, the number of Snakes and Frogs decreases very steadily with the increasing elevation. From the above list we find—

16 Snakes and 5 Batrachians at 1000 feet.			
14	„	5	2000
13	„	4	3000
13	„	5	4000
11	„	2	4500
10	„	1	6000
8	„	1	7500
5	„	1	8000
3	„	1	9000
2	„	1	10000
1	„	0	15000

\* Several freshwater Tortoises, sent by Mr. Hodgson from Nepal, belong to the lowland fauna, being the most common species at the mouth of the Ganges.



Three different zones of elevation are very clearly indicated, less by the appearance of forms similar to, or identical with, those of the subtropical and temperate regions (as is the case in the flora and in several other parts of the fauna), than by the appearance of new species and genera peculiar and confined to the Himalaya, and especially by the disappearance\* of such species which are abundant in the lowlands. The most common species of Lizards in the plains south of the Himalaya are *Calotes versicolor* and *Tiliqua rufescens*. Both ascend the mountains; but the former disappears at an elevation of 3400 feet, the other at 9600 feet. The most common species of Snakes throughout the Indian continent are *Tropidonotus quincunciatus* and *Simotes russellii*: they disappear at 4000 feet, whilst *Clothonia johnii*, by no means a rare species, extends nearly to 10,000 feet †. With regard to the Batrachians, we find that *Bufo melanostictus*, the most common East Indian Toad, disappears at 9000 feet in the Southern Himalaya; whilst *Bufo vulgaris*, the most common Toad of the Palæarctic region, extends to 10,200 feet in Tibet. Thus, although we must always bear in mind this fact—that changes in the faunas of the various elevations succeed each other *gradually*, and that these successions necessarily vary at different localities even of the same elevation—we may well suggest that at an elevation of 4000 feet, and again of 10,000 feet, such a change takes place, that we are justified in separating the Amphibio-fauna of the Himalayas into three divisions, concurring thus with the views of Mr. Hodgson, who has established the same zones for the Mammals and Birds ‡.

1. *The Tropical Zone; zone of Tropidonotus quincunciatus (from the level of the plains to 4000 feet above the level of the sea).*

The climate of this zone bears an entirely tropical character; it is covered by a very rich vegetation §, with the prevalent timber gigantic and scaled by climbing Leguminosæ; bamboo and luxuriant ferns abound, and the first decided signs of a change of the flora cannot be observed below 3500 feet. In accordance with this, the Amphibio-fauna is extremely similar to that of Tropical India; we find in this zone the following species || :—

\* The upper elevational limits of the land-animals are much more distinct than the lower ones; *vice versa* in sea-animals. See Schmarda, 'Geograph. Verbreit. der Thiere,' p. 70.

† The black variety of the Copra de Capello (*Naja tripudians*) certainly ascends higher than 8000 feet; it would very finely illustrate our division if this suggestion should prove to be true.

‡ Journ. As. Soc. Beng. 1850, p. 772.

§ The botanical characters of the zones are taken from Dr. Hooker's 'Himalaya Journal.'

|| In all the following enumerations of species, those only have been referred to, the elevational limits of which have been stated.

A. *Between the level of the plains and 2700 feet.*

- |  |                                   |
|--|-----------------------------------|
| * <i>Emyda punctata.</i>               | * <i>Simotes russellii.</i>       |
| * <i>Tiliqua rufescens.</i>            | * <i>Coryphodon blumenbachii.</i> |
| * <i>Calotes versicolor.</i>           | * <i>Gongylophis conica.</i>      |
| * <i>Gecko verus.</i>                  | * <i>Ablabes collaris.</i>        |
| * <i>Uromastix griseus.</i>            | * <i>Lycodon aulicus.</i>         |
| * <i>Clothonia johnii.</i>             | * <i>Naja tripudians.</i>         |
| * <i>Tropidonotus subminiatus.</i>     | * <i>Daboia elegans.</i>          |
| *—— <i>quincunciatus.</i>              | * <i>Rana tigrina.</i>            |
| *—— <i>stolatus.</i>                   | *—— <i>vittigera.</i>             |
| * <i>Psammodynastes pulverulentus.</i> | * <i>Tomopterna strigata.</i>     |
| * <i>Dipsas trigonata.</i>             | * <i>Rufo melanostictus.</i>      |
| * <i>Simotes purpurascens.</i>         | * <i>Polypedates maculatus.</i>   |

B. *Between 2700 and 4000 feet.*

- |  |                                   |
|--|-----------------------------------|
| <i>Barycephalus sykesii.</i>           | * <i>Coryphodon blumenbachii.</i> |
| * <i>Tiliqua rufescens.</i>            | * <i>Gongylophis conica.</i>      |
| <i>Calotes maria.</i>                  | * <i>Ablabes collaris.</i>        |
| *—— <i>versicolor.</i>                 | * <i>Naja tripudians.</i>         |
| * <i>Clothonia johnii.</i>             | * <i>Daboia elegans.</i>          |
| * <i>Tropidonotus subminiatus.</i>     | <i>Rana liebigii.</i>             |
| *—— <i>quincunciatus.</i>              | *—— <i>vittigera.</i>             |
| *—— <i>stolatus.</i>                   | * <i>Tomopterna strigata.</i>     |
| * <i>Psammodynastes pulverulentus.</i> | <i>Dicroglossus adolfi.</i>       |
| * <i>Dipsas trigonata.</i>             | * <i>Bufo melanostictus.</i>      |
| * <i>Simotes purpurascens.</i>         | * <i>Polypedates maculatus.</i>   |
| *—— <i>russellii.</i>                  |                                   |

The species marked with an asterisk are found also in the plains of Lower India.

It is evident from the lists given that we intend to establish two subzones for the Amphibio-fauna. In the parts below 2400 feet the Reptiles are entirely identical with those of the plains; there is not one species which indicates that we are at the foot of the gigantic wall which separates the Palæarctic from the Palæotropical region, and the total absence of Crocodiles appears to be the only, but important, sign of a coming change. Several other Reptiles gradually disappear: *Gecko verus*, *Uromastix griseus*, the true Tree-snakes of green colour, *Rana tigrina*, *Emyda punctata*, and finally *Lycodon aulicus*. In the upper portion of the zone appear two new Frogs, but they are merely representatives of species found in the lower one and in the plains, namely *Dicroglossus* representing *Oxyglossus*, and *Rana liebigii*, replacing *Rana tigrina*. *Barycephalus* begins here, and, although a genus peculiar to the Himalaya, it belongs to the family of *Agamidæ*, which is chiefly East Indian. The upper limit of this zone is remarkably distinct, and indicated by the simultaneous disappearance of one-third of the species found within its extent (*Calotes versicolor*, *Simotes russellii*, *Tropidonotus quincunciatus* and *stolatus*, *Ablabes collaris*, *Daboia elegans*, *Dicroglossus adolfi*, *Rana liebigii*).

2. *The Temperate Zone; zone of Tiliqua rufescens.*—4000–10,000 feet above the level of the sea.

A great change in the flora takes place at an elevation of 4000 feet, and is complete at 4800. Scattered oaks appear in the midst of a tropical vegetation; these, with chestnuts, magnolias, laurels, and tree-rhododendrons become gradually more numerous; at from 6000 to 7000 feet, plants of the temperate regions blend with those of the tropical; the vegetation yet continues to be gorgeous, and is, in some respects, not to be surpassed by anything in the tropics. At 8000 feet, forests of firs and many subalpine plants appear; the traveller, who was glad to have escaped the leeches, which received him at the entrance of this zone, finds himself now attacked by another species, not less blood-thirsty: the mean temperature at this elevation coincides most nearly with that of London, viz. 50°. A little higher up, the thermometer falls in nights of the month of November to 30°, whilst at 9700 feet it reaches 67° in the noon of August. No marked change in the flora takes place from 8000 feet towards the upper limit of the zone; but at 10,000 feet extensive snow-beds have been found yet unmelted in June. We must refer to this zone what we know of the Reptiles of the Khasia Mountains; and the fact stated by Dr. Hooker, that the temperate flora descends fully 4000 feet lower in the latitude of Khasia than in that of Sikkim, though the former is two degrees nearer the equator, appears to be fully confirmed by a similar modification of the elevational limits of the reptiles. Several species collected in Khasia, apparently not much above 3000 feet, where the tree-vegetation has already disappeared, are found in the Himalaya not below the middle of this zone, and spread even beyond it; for instance, *Hinulia*. Other species show at least a distinctly higher range in the Himalaya. It is clear, from what we have said above, that all the physical conditions for a rich Amphibian life extend through nearly the whole zone, but the influence of elevation makes itself very perceptible by the decrease of the number of species in the higher parts.

a. *Species between 4000 and 8000 feet.*

- |  |                                    |
|--|------------------------------------|
| <i>Hinulia indica.</i>                     | <i>Brachyorrhos tenuiceps.</i>     |
| <i>Barycephalus sykesii.</i>               | <i>Simotes purpurascens</i> , var. |
| * <i>Tiliqua rufescens.</i>                | <i>Xenodon macrophthalmus.</i>     |
| <i>Calotes tricarinatus.</i>               | <i>Coryphodon carinatus.</i>       |
| * <i>Clothonia johnii.</i>                 | *— <i>blumenbachii.</i>            |
| * <i>Tropidonotus subminiatus.</i>         | <i>Spilotes reticulatus.</i>       |
| — <i>platyceps.</i>                        | <i>Ablabes rappii.</i>             |
| <i>Trachischium fuscum.</i>                | * <i>Gongylophis conica.</i>       |
| — <i>obsкуро-striatum.</i>                 | * <i>Naja tripudians.</i>          |
| * <i>Dipsas trigonata.</i>                 | * <i>Rana vittigera.</i>           |
| <i>Herpetoreas sieboldii.</i>              | <i>Bufo vulgaris.</i>              |
| <i>Psammodynastes pulverulentus</i> , var. | * <i>Bufo melanostictus.</i>       |
|  | <i>Rhacophorus maximus.</i>        |

## b. Species between 8000 and 10,000 feet.

<i>Hinulia indica.</i>	<i>Trachischium fuscum.</i>
<i>Barycephalus sykesii.</i>	<i>Tropidonotus platyceps.</i>
* <i>Tiliqua rufescens.</i>	<i>Trigonocephalus affinis.</i>
<i>Tiaris elliotii.</i>	<i>Bufo vulgaris.</i>
* <i>Clothonia johnii.</i>	*— <i>melanostictus.</i>
<i>Ablabes owenii.</i>	

The upper limit of this zone is marked by the disappearance of a Saurian (*Tiliqua rufescens*), of a Snake (*Clothonia johnii*), and of two Batrachians (*Bufo melanostictus* and *B. vulgaris*). Several other tropical Snakes reach more or less deeply into this zone, and their range may help some day to establish two or three subzones; for the present, however, I will merely suggest the feasibility of separating the upper part (from 8000 to 10,000 feet) from the lower.

The greater number of the species are peculiar to the Himalaya: the tree-lizards of the Tropical zone (*Calotes*) are here replaced and represented by a distinct species (*C. tricarinatus*), the other species of Saurians being such as live on or below the ground. As for Snakes, the absence of *Calamaria* and *Elaps* strikes us first, both genera being strictly confined to tropical regions. Tree-snakes are scarcely represented by *Dipsas trigonata* and *Herpetoreas*, which do not extend on to 8000 feet. All the others are ground- or freshwater-snakes belonging to genera, which, if not confined to the Himalayas, are spread over parts of the globe so different, that the Amphibio-fauna of this zone is by no means strikingly stamped with the character of the temperate regions. Two instances alone\* remind us of the fact that a great part of the plants and insects of this zone are identical with European forms; namely, the occurrence of a Snake at 9000 feet, which is nearly allied to, or perhaps really identical with, *Trigonocephalus halys* from the shores of the Caspian Sea and Tartary, and which has another congener in *Trigono-*

\* It is a pity that a more exact statement of the locality of the Khasia Blind-worm, *Dopasia gracilis*, has not been preserved; it appears to belong to this zone. Dr. Hooker (Him. Journ. ii. p. 301) says that "it belongs to a truly American genus," and appears to have been guided in so saying by the opinion of Dr. Gray, who, however, after referring it first to the European *Pseudopus*, and afterwards to the American *Ophisurus*, has founded a separate genus upon it—*Dopasia*. The occurrence of a form in Khasia so closely allied to northern genera is remarkable enough; but if we separate these three forms generically from one another (for which, in my opinion, the differences are not important enough), *Dopasia* has quite as much resemblance to *Pseudopus* as to *Ophisurus*; the palatine teeth in *Dopasia* forming a very narrow band, whilst this band in *Ophisurus* is broad. Another assertion of Dr. Hooker (*l. c.*), "that the Sikkim Skink and Agama are also American forms," is not correct. The appellation of "Sikkim Skink" can be applied with the same right not only to *Plestiodon sikkimensis* (probably referred to by Dr. Hooker), but also to *Hinulia indica* and *Tiliqua rufescens*; the two latter genera are confined to the East Indies and to Australia, and the former is, it is true, represented by some American species, but two or three others occur in different parts of the East Indies; so that this genus of Skinks can by no means be called a North American form. With regard to the "Sikkim Agama" being called an American form, it must be mentioned, that the *Agamidæ* are a family confined to the Old World.

*cephalus blomhoffii* from Japan; and, secondly, the presence of our common toad in Sikkim and Tibet. The latter species is spread over all the parts of Europe and Asia belonging to the Palearctic region; it is found also in Japan and on the Chinese island of Chusan (*Bufo gargarizans*, Cant.), and offers here, in the Himalaya, the example of the greatest elevation of a Batrachian known (10,200 feet), illustrating a law which is generally found to be true,—namely, that animals with a wide horizontal range have also a great vertical distribution.

The number of species rapidly decreases with the rising elevation; and when we arrive at the upper limit of this zone, we find it reduced to three Saurians, two Snakes, and a single Batrachian; four of these disappear simultaneously (*Tiliqua rufescens*, *Ablabes owenii*, *Clothonia johnii*, and *Bufo vulgaris*), and at this elevation mark the highest point to which an otherwise tropical form is known to rise.

### 3. *Alpine Zone*; zone of *Barycephalus sykesii*.—10,000–15,000 feet.

The lower part of this zone is covered by a vegetation by no means scanty, and continuing to be similar to that of England, or towards the middle to that of the Scandinavian peninsula, whilst agricultural plants may be cultivated, and the different species of *Pinus* form extensive forests, but trees and shrubs cease at several localities of the upper part. The line where perpetual snow, or a barren, frozen ground oppresses the vegetative life, appears to vary much in different localities, independently of the fact that it is higher on the northern side of the chains than on the southern. Dr. Hooker, for instance, found perpetual snow at 15,000 feet in East Nepal, and on one side of a mountain in Tibet at 16,500, whilst on the other there was none at 19,000 feet. Meyen\* states the presence of low shrubs at 15,000, and of mosses and grasses at 15,500 feet. The occurrence of Reptiles proves at least a local vegetation above 15,000 feet. The thermometer rises in June and August to 70° in the noon at 11,500–11,900 feet, to 43° at 15,700, whilst it falls in November and December to 29½° in the noon in 13,080, and to 12–15° in the night. Thus the Reptiles inhabiting this zone are subject to the conditions of a very severe change in the different seasons, and they fall into a lethargic state during the winter, like our European species †. The species found within this zone are the following:—

<i>Phrynocephalus tickelii</i> .	<i>Biancia nigra</i> .
<i>Hinulia indica</i> .	<i>Calotes minor</i> .
<i>Barycephalus sykesii</i> .	<i>Spilotes hodgsonii</i> .

\* Wiegman. Arch. 1836, pp. 317, 318. It is not said which measurement (English or French) has been used.

† The Reptiles which inhabit the upper parts of the temperate zone hibernate of necessity: and we have the remarkable fact of species being adapted to pass part of a year in lethargy, whilst other individuals of the same species living in a tropical climate never become subject to an influence similarly depressive of the vital functions. Is this not proof enough that one and the same species may extend over two or more horizontal regions?

None of the tropical species extend into this zone; and, although it is not improbable that a future traveller may discover the presence of Batrachians, their number will be very limited. The first of the species mentioned offers another example of the occurrence of northern forms in the Himalaya, the genus *Phrynocephalus* having its range over High Asia to the shores of the Caspian Sea and to Siberia; the species is said to be found also in Afghanistan. *Barycephalus* and *Biancia* are peculiar to the Himalaya, and the former bears a striking resemblance to *Microphractus* of the Andes of Ecuador: in fact, they do not differ in any essential external character, and would be referred to the same genus if it were not for the dentition. A single Tree-lizard enters this zone (*Calotes minor*), replacing *Calotes tricarinatus* of the temperate zone, but it is of small size, and the bright green colour of other species is changed to a dull yellowish, marbled with brown. Finally, the only species of Snake (*Spilotes hodgsonii*) is a representative of Indian forms—namely, of *Sp. reticulatus* from the temperate zone, and of *Sp. melanurus* from the lowlands.

Thus, although the forms of this zone are specifically distinct from those without the limits of the Himalaya, its Amphibio-fauna is mixed, and composed partly of species which approach northern or southern forms, and partly of others quite peculiar to those mountains.

In conclusion, it will be of interest to make a comparison of the greatest elevations at which Reptiles have been found in different parts of the globe. In the Alps and in the Andes the Batrachians ascend to much greater heights than Lizards or Snakes, whilst in the Himalaya these latter appear to go higher; a discrepancy, however, which may arise from our present incomplete knowledge, as it is very probable, in my opinion, that some species of Toad or Salamander will be discovered at a greater altitude than the specimens of *Bufo vulgaris* from the Collection of Messrs. v. Schlagintweit. *Bufo vulgaris* and *Salamandra atra* live in the Alps at 6000 feet, *Rana temporaria* round lakes, near the region of eternal snow (8500 feet), which are nine months covered with ice; *Triton* at 7800 feet in the Pyrenees. Castelnau\* found a Tree-frog at nearly 15,000 feet (English) in the Andes, and Tschudi† *Leiuperus viridis* (a species little known) near the region of eternal snow at 16,000 feet. With regard to Snakes, the occurrence of *Spilotes hodgsonii* at 15,200 feet in the Himalaya gives the highest point at which an Ophidian has ever been found; for *Vipera berus* and *Tropidonotus natrix* reach to 6000 feet only in the Alps, and the former to 7000 feet in the Pyrenees; Castelnau states that he met with two Snakes only at 7500 feet in the Andes. The Lizards rise still higher: three species of them live at 15,300 feet in the Himalayas. The statements as to the altitudinal extent of our European species are scanty: *Zootoca vivipara* is known to rise in the Austrian Alps to 3500 feet, and *Anguis fragilis* to 5000. Castelnau merely observes that

\* Comptes Rendus, xxvi. p. 101.

† Tschudi, Faun. Peruan. Herpetol. p. 68.

Lizards are numerous on the table-land of Peru and Bolivia below 12,000 feet. At all events, upon comparing these observations of Castelnau with those made in the Himalaya, we must come to the conclusion that Lizards are better adapted than Snakes to inhabit the highest localities in which Amphibian life is possible.

8. ON THE CAUSES OF DEATH OF THE ANIMALS IN THE SOCIETY'S GARDENS, FROM 1851 TO THE PRESENT TIME, 1860. BY EDWARDS CRISP, M.D., F.Z.S., ETC.—(PART I.)

Before I proceed to the immediate subject of my paper, a few preliminary remarks will be necessary.

In the earlier Numbers of our 'Proceedings' several accounts of the morbid parts of animals dissected are given by Professor Owen, Mr. Martin, the late Mr. Yarrell, and others; but I believe no attempt has been made in this or in any other country to investigate the diseases of foreign animals in confinement, in a comprehensive manner, so as to endeavour to draw practical and useful deductions from them. Such will be my object in the present communication. I have made rough sketches in oil-colours of many of the diseased parts I shall have to describe, so that they may be the better understood. In 1851 I obtained permission from the Council of the Zoological Society to examine all animals dying at the Gardens, for the purpose of physiological investigations; but in these researches I was especially anxious to ascertain the cause of death in all the animals I dissected, believing that the morbid condition of certain organs might throw some amount of light upon their functions. I mention this for the purpose of showing that, if I had examined these animals exclusively for the purpose of comparative anatomy, I should have been less careful about their abnormal conditions.

In most instances in the examination of the blood, and in the investigation of morbid structures, I have been aided by the use of the microscope. The large number of notes that I possess would enable me to make a very long communication; but, as my chief object in bringing this matter before the Society is to convey useful and practical information in plain and simple language, I shall reserve some of the more minute and scientific parts of the subject for the Pathological Society. In addition to these remarks, I may express my *belief that the nature of the diseases of man will not be thoroughly understood, nor appropriately treated, until the deviations from normal structure are fully investigated in plants and in the lowest grade of animals*: a doctrine, I believe, not promulgated before, and one that will be laughed at by many; but I have the greatest confidence that this mode of throwing light on the dark and uncertain nature of the art of medicine will hereafter be adopted.

For the purpose of pointing out what I believe to be the importance of this matter, I trust I may be pardoned for quoting a short extract from my work on the Spleen, written in 1852:—"Nearly all

the great discoveries in physiology have been made by experiments upon living animals, in a state of health ; but why should not their diseased conditions be turned to account ? Why may not brute pathology hereafter clear up some of the doubts and difficulties of our art ? The examination of one of the lower animals that has been kept in confinement is attended with these great advantages :—the exact nature of the food, and the deviations from the natural state of the animal, can be readily ascertained ; and if the animal is small (a bird *e. g.*), the morbid parts are revealed at once, and the chain of causes is more apparent than in larger quadrupeds, the investigator always taking into account the peculiarities of structure.”

I divide my subject into two parts, the first including that which forms the heading of this paper ; the second will treat upon the best means of preserving the health of animals in confinement, and of preventing the disorders and diseases to which they are liable. The former division I shall consider this evening.

It will be well to remember that most of the animals in question were living in an artificial state, many of them exposed to a temperature much lower than that which was natural to them ; their food, too, generally different from that which they were accustomed to obtain in their native haunts ; and the situation of the Gardens, on a cold, clayey soil, is another matter that should not be lost sight of. We must also, in estimating the nature of the diseases of quadrupeds, birds, and reptiles, consider the peculiarities of their anatomy. Thus that of the Mammals does not differ very materially, so far as regards diseased conditions, from that of man ; many of them have a slower circulation, and the complexity of the stomach and the length of the alimentary canal, in the Ruminants especially, are important items in the account.

In birds the temperature is several degrees higher and the circulation much more rapid than in quadrupeds ; whilst in reptiles the blood is cold, and the action of the heart generally slower than in the higher classes.

The natural longevity of the lower animals is a point that should not escape observation. In the vast majority we have no means of knowing the age which they attain, and even among our British wild quadrupeds and birds we possess but little reliable information. As regards our domestic animals we are not much better informed, for but few of them are allowed to live the natural period of their existence. The probable *average* age of some of our British animals, judging from my own inquiries and investigations, is about as follows :—The horse 25 to 35 years, ass 30 to 40, ox 15 to 20, goat 15, sheep 15, pig 12 to 16, dog 14, fox 14, cat 16, hare 11, rabbit 11 ; the eagle and many of the accipitrine birds 30 to 60 ; the small passerine birds 12 to 16 ; ravens 30 to 50 ; goose 25 to 40. Many of the gallinaceous birds, as far as my information goes, are the shortest lived, some of them, the Cochin China cock for example, in some localities not living more than six or eight years. Among the reptiles, the tortoise is nearly the only one about the age of which we possess any positive information, and this animal is said to live a



hundred years ; and some of the Saurians (Alligators and Crocodiles) are probably very long lived. Another remark I may make *en passant* : the old adage "*Soon ripe, soon rotten*," like many wise sayings, so called, is frequently inapplicable, for the raven and the goose in a few months attain their natural size ; whilst many animals that are comparatively short-lived are much longer in coming to maturity. It must be borne in mind, too, that individuals among the lower animals, as among the human species, occasionally reach a great age. Thus Youatt mentions one instance of a horse that died at the age of sixty-two. I know of an instance of a Suffolk cart-mare that bore a foal when forty-two years of age ; and I have recently dissected a cat that had reached the age of twenty.

I now come to the gist of my subject, viz. the cause of death of many of the animals during the period alluded to. For the sake of brevity and perspicuity, I will speak of the animals in classes according to the Cuvierian arrangement ; one advantage of this method will be the consideration of the differences in structure in connexion with the morbid changes.

The description of the secondary, or what may be called minor lesions, I shall make brief allusion to at the end of my paper, and confine myself at present to those diseases which, as far as I could judge, appeared to be the immediate cause of death.

I scarcely need say that in many instances it is difficult to ascertain the exact or immediate cause of death, so that a great number of deaths must come under the denomination of doubtful. Thus, fully to explain my meaning, an animal labouring under a chronic disease readily succumbs to any depressing cause, such as exposure to cold, change of diet, or food of an improper kind, slight external injury, &c., the vital forces being insufficient to resist a shock that an animal in a healthy condition would bear with impunity. I could give several examples of this during the late cold weather. An Armadillo (*Dasypus peba*), with a large and fatty liver, became suddenly torpid, and died in a short time. A Wagati Cat (*Felis viverina*) that had partly lost the use of the hind limbs appeared to die solely from the depressing influence of cold. A Civet Cat (*Viverra civetta*), in good condition and apparently in good health, died in a fit, the consequence probably of determination of blood to the brain from cold. I could mention several examples of birds that died from a similar cause, the presence of tubercles on the liver, spleen, and other parts, rendering the animals more susceptible to its influence. Animals, too, often died soon after a long voyage, the confinement, unnatural food, and other causes producing derangement of the vital functions. A Dusky Duck (*Anas obscura*) that lately arrived from America had no discoverable disease in any part, but the small intestines contained thousands of entozoa (*Ligula*), and these, combined with the cause above alluded to, were sufficient to produce death. A monkey had been two years at liberty ; after a few months' confinement in the monkey-house it died, and I could discover no sufficient cause of death. Another point must not escape observation, viz. the impossibility in most instances of exa-

mining the brain, as the specimens were many of them used for stuffing or for skeletons. I believe, however, that diseases both of the brain and heart are comparatively rare in the lower animals, although their occurrence is far from unfrequent,—the absence of mental exertion will to a great extent serve to explain this. Sudden and immediate death sometimes occurs, but it is very unfrequent.

*Quadrumana*.—Of these I have inspected the bodies of sixty-seven, and I may remark here that I speak in this communication only of the animals dying at the Society's Gardens. Among them were two Ourangs (*Simia satyrus*) and four Chimpanzees (*S. troglodytes*); three of these apes died of *diarrhœa*, two of *pneumonia*, and one of diseased kidneys. They were between two and four years of age, and all were teething. There is, I think, but little chance of the young anthropoid apes living long in this country; if they could be obtained when nearer the adult period, there would be a much greater probability of keeping them for several years. I have neither time nor space to notice separately the diseases of the different animals; I shall therefore endeavour to classify the diseases as well as I am able, and comment briefly on the rarer forms of abnormal structure, especially when they occur in animals that have seldom or never before been dissected in this country. The supposed cause of death in the *Quadrumana* may be thus classified (I use the term supposed, because in this order, as in most of the others, I may often have been in error respecting the immediate cause of death): pneumonia 13, pleuritis and pericarditis 11, tubercles of the lungs 17, tubercles of the liver, spleen, and other parts 5, diarrhœa 4, atrophy 5; one of each of the following: tetanus (from diseased tail), epilepsy, fungus hæmatodes of the lungs, fatty liver, diseased kidneys, ruptured stomach, and aneurism of the aorta. In thirteen I could not discover any sufficient cause of death; but in these, as in most of the other specimens, from circumstances before alluded to, the brain was not examined.

The above deductions serve to correct a prevailing error, viz. that nearly all the *Quadrumana* in this country die from tubercles in the lungs. In five monkeys that I have recently examined no tubercles were present in any instance. It is true that disease of the lungs is the most frequent morbid change, and that consolidation of the pulmonary tissue from inflammation is generally the forerunner of tubercular deposit; but a great number, as the list shows, die from other causes. As might be expected, the diseases of this order resemble more those of man than any of the succeeding. In one instance the transmission of the tubercular diathesis was very marked. A female *Rhesus* monkey that I examined died of extensive tubercular deposit in the lungs and in other organs; she had borne five young ones: two of these which I inspected also died of tubercles in the lungs, and probably the others shared the same fate.

As I shall have occasion to speak often of tubercle, I may as well at once point out the peculiarities of this deposit in the lower animals. Thus, large cavities, so common in the lungs of man, are but rarely met with in the brute, the extraneous matter having a more solid

and cheese-like appearance. In birds the deposit is mostly hard and formed in concentric layers, differing materially from that which occurs in the human subject; it is often met with, too, on the surface of organs, in the shape of small nodules. This form of tubercle, I believe, is often of rapid formation, its structure being more albuminous than that of the other varieties. In reptiles it is generally softer and less circumscribed than in birds. Of all the chronic lesions to which foreign animals in confinement are exposed, this is by far the most frequent, although probably in their wild state it seldom occurs. I have examined the bodies of all the British quadrupeds and reptiles, and the greater number of the British birds, but, with two or three exceptions, they have been free from this disease. One of these exceptions was in a large number of Common Sparrows (*Fringilla passer*) that were found dead some years since in the Society's Gardens; in nearly all of these I found tubercles of the liver, spleen, or other organs,—a fact that does not speak much in favour of the locality of the Gardens.

The length of time that some animals will live with extensive tuberculous disease of the lungs and other parts is remarkable. In 1853 I had an opportunity of watching a Patas Monkey (*Cercopithecus ruber*); for some time the symptoms were a short, dry cough, loss of appetite, dull eye, great emaciation, and a pulse of 140 per minute. There was scarcely a sound portion of lung in this animal, the whole being studded with tubercles in various stages of development. The wonder is that life could have been prolonged under such a vast accumulation of disease.

The presence of aneurism in a monkey has not, as far as I know, been before observed, and, although I have been especially careful to examine the larger arteries in most of the animals I have dissected, I have only in one instance—an old Capybara (*Hydrochaerus*)—met with ossified deposit,—an alteration so common in the human subject.

*Chiroptera*.—Three *Pteropi* (Fruit-eating Bats) are the only members of this order that I have inspected, and, with the exception of evidence of want of nutrition, no sufficient cause of death could be discovered.

*Carnivora*.—The animals of this order examined amount to more than one hundred, and their diseases differ in many respects from the preceding. Tubercles of the lungs are much less frequent, but their occurrence in the liver and spleen is not uncommon. Although it is said that “a cat has nine lives,” many of the *Felidæ* are readily killed by a slight amount of inflammation of the lungs. In several deaths I have found the first stage of *pneumonia* sufficient to produce the fatal result. Among the Carnivora, I have examined six lions (including two cubs), four tigers, two jaguars, and four leopards. One lion had a false aneurism of the lung; a lioness died in convulsive fits; I found a large quantity of hay in the stomach, but could discover no lesion of the brain or other organ to account for death. I may here mention that I have met with several cases of fatal obstruction of the bowels in carnivorous animals from this cause: large accumulations of hay and straw are matted together in the intestines, ren-

dering them impervious. The most extraordinary example, however, that has come to my notice occurred in a common cat at Barclay's Brewery, and in this instance, as the case is a very practical one, I think I may depart from the plan I had laid down of confining my notices to deaths in the Society's collection. The cat in question had been for a long time confined in one of the corn-chambers, and was unable to procure grass; she gradually became emaciated and died nearly a skeleton; after death the stomach was found filled with a solid mass, formed of the twigs of birch-brooms. Mr. Braby, the intelligent veterinary surgeon of the establishment, gave me a half-section of this mass; it is now in the Museum of the College of Surgeons. I mention the case especially for the purpose of showing the importance of supplying carnivorous animals with grass. A most remarkable form of disease occurred in 1854 among some of the cats (lions, tigers, and jaguars), arising, I believe, from their having eaten glandered horseflesh. The animals had most of the symptoms of this fearful disease, which is so often transmitted to man; rabbits and cats that I inoculated from the nasal purulent matter of a jaguar died in a few days. A short time before this, as related to me by Mr. Bartlett, two gentlemen dissected at the Gardens a lion that was probably affected with the same disease: one died, and the other was nearly two years before he recovered from the effects of the poison. A remarkable instance of attachment occurred in the Cape hunting-dog (*Lycæon pictus*), as I have stated in the 'Proceedings' for 1855; after the death of the dog, the bitch pined away, refused her food, and died in ten days. Many of the carnivorous animals were excessively fat, especially the bears. In a Persian lynx the quantity of fat in the pelvis and abdomen was very great, and I have seen similar accumulations in many of the *Felidæ*. Some writers on fatty degeneration in man have stated that the deposit of fat in wild animals is seldom or never met with; but this is an error; in many of our British wild animals it is very abundant. The body of the Barn-owl (*Strix flammea*) now on the table contains a large quantity of fat, a thick layer of which also existed under the skin; indeed I have never seen the same amount in a graminivorous bird. Lieutenant Burgess, some of whose papers are in our 'Proceedings,' informs me that many birds which he shot in India were exceedingly fat.

The chief diseases of the Carnivora may be arranged under two heads, viz. the inflammatory and the tuberculous, the latter (as I believe) being generally the effect of the former. One bear (*Ursus americanus*) died suddenly in a fit, and it is said that in these animals sudden death is not unfrequent. In one instance I found the lung of a tiger emphysematous, the ruptured air-cells forming elevations as large as walnuts.

*Amphibia*.—In three seals (*P. vitulina*) and in a walrus (*T. rosomarus*) the cause of death was not evident; the last-named animal had been fed by the Scotch captain who brought it to this country upon oatmeal!

*Marsupialia*.—The marsupial animals examined number about thirty; many of them were very fat; tubercles of the liver are com-

mon in this division, and this organ is often soft and fatty. A tree-kangaroo (*Dendrolagus inustus*) had tubercles of the liver. The most remarkable death among these pouched animals was that of a great kangaroo (*Macropus major*), namely, from bleeding of the bowels; the blood appeared to ooze from a large extent of surface of the mucous lining of the alimentary canal. This membrane was very dark and ecchymosed. The cause of this was not apparent, as the animal was in excellent condition. In two Tasmanian Wolves (*Thylacini*) the deposit of fat was very abundant, and in one which died in hot weather, and the body of which was exhumed, the oily fat appeared to permeate almost every tissue.

*Rodentia*.—About thirty individuals of this order have been dissected, and tuberculous deposits in the liver and spleen were often present; several died from inflammation of the lungs. A Canadian porcupine (*Erethizon dorsatum*) died of distended stomach, having gorged itself with potatoes, after a sea-voyage. A beaver (*Castor fiber*) presented a large amount of tubercular disease of the liver and spleen, although in tolerable condition; whilst the body of the large squirrel (*Sciurus maximus*), in excellent condition, revealed no satisfactory cause of death. The two Capybaras afforded the most remarkable deviations from normal structure; one, as recorded in the 'Proceedings of the Pathological Society,' 1854, p. 347, had scirrhus of the kidney; the last that died had the liver so softened that the bile-ducts, arteries, and veins could be readily pulled from the substance of the liver; both suprarenal capsules, too, were enlarged and diseased,—a very rare occurrence in the lower animals.

*Edentata*.—The examination of the misnamed toothless animals has been very limited, three armadillos and one large ant-eater (*Myrmecophaga jubata*) forming the whole. The armadillos appeared to die from derangement of the assimilative organs; in one the liver was soft and fatty, but in none of the above was there any active disease.

*Pachydermata*.—Although the animals in this section are but few in number, the morbid appearances were of especial interest. In the female Asiatic elephant which I examined the condition of the blood was very remarkable; it was generally tough, and could readily be pulled out of the vessels; one portion from the posterior *cava* and iliac veins measured 4 feet in length. The animal, apparently in good health, was frightened during a thunder-storm, had profuse watery diarrhoea, and died the next day. As these animals are not often inspected, I may mention that I examined the viscera of another Asiatic elephant that died in Yorkshire from inflammation of the lungs after exposure to severe cold. Of three tapirs (*T. americanus*), two died of peritonitis; in one this was occasioned by a small oblong smooth perforation of the stomach from simple ulceration, as exhibited in the drawing; in the second the cause of the peritonitis appeared to be doubtful; the third had brain symptoms from diseased kidneys. The death of two peccaries (*Dicotyles torquatus*) was occasioned by inflamed lungs. An Indian sow (*Sus indicus*) died of abscess of the brain. A zebra, when apparently in good health and in excellent condition, broke its neck by striking its head against the

palings of the paddock. It will scarcely be believed that the colon and cæcum of this animal weighed 224 lbs.; the liver, as shown in the drawing, was covered with large cysts (*Echinococci*); one of them contained 8 oz. of yellowish fluid; probably the fluid contents of all the cysts amounted to about three pints; but, notwithstanding the presence of these *Entozoa*, the animal appeared to be in perfect health.

In the female African wart-hog (*Phacochoerus*) that recently died at the Gardens, the animal had suffered from peritonitis and perforation of the intestine.

*Ruminantia*.—The inspections of the members of this order have been far more numerous than those of the preceding, including some of the rarer species of deer and antelopes; their diseases too are of a more varied nature; the presence of *Echinococci* in the liver, lungs, and other viscera, is very frequent. My space will not allow of my alluding so fully to some of the morbid conditions which I have found in the ruminants as I could wish. Of two giraffes which I inspected, one had diseased liver, and the paunch was enormously distended with food; it probably weighed more than a hundred weight, and this distension was most likely the cause of death; the liver and spleen both contained acephalocysts the size of a hen's egg, and the buccal glands were filled with chalky concretions about the size of peas; this was an old female that had borne six young ones. The second was a younger animal, and appeared to die of inflammation of the lungs. The alimentary canal of the old giraffe measured 254 feet in length, that of the other 209 feet. I mention this, because, as these measurements differ materially from those of many who have examined other specimens of this animal, future inquirers must determine their accuracy. In three reindeer (*Cervus tarandus*), all in good condition, the deaths appeared to arise from enormous distension of the paunch, similar to that which sometimes occurs in sheep after eating coleworts or other succulent food; the lichen was probably not sufficiently dried. In one of these animals the heat of the contents of the paunch was so great that I could scarcely bear my hand upon it.

In a Harte Beeste (*Antelope caama*) I found false aneurism of the spleen. In a Sambur deer (*Cervus hippelaphus*), in excellent condition, nearly the whole of the lining membrane of the small intestines was covered with flakes of lymph; an appearance which I never witnessed in any other animal. This deer had been lying upon the cold ground, and probably the inflammation was thus occasioned.

Many of the deer and antelopes died from inflammation of the lungs, especially those of immature age. Tubercles of the lungs are also very common among them. In the old male leucoryx (*Antelope leucoryx*) the lungs were studded with tubercles. A leucoryx a year old, got by the above, had not only tubercles in the lungs, but the whole length of the exterior of the intestinal tube was covered with small, hard, semitransparent tubercles,—a disease in the human subject called tubercular peritonitis. This is another instance which shows the hereditary nature of tubercle in the lower animals.

In a Bubaline antelope (*Antelope bubalis*), which died of extensive tubercular disease of the lungs, I found a Bezoar in the paunch,—a concretion that, some years ago in the East, would have realized some thousands of pounds.

In an Addax (*Antelope addax*), besides an extensive deposit of tubercles in the lungs, there was a large accumulation of bony matter around the air-cells, as shown in the preparation.

In the old female elk (*Cervus alces*), which died last year, portions of the lungs were inflamed and in the first stage of consolidation; the blood too, as I have found in many animals, was dark, thick, and treacle-like. The alimentary canal of this animal measured 129 feet.

Although I have endeavoured to compress the notes before me as much as possible, I find the subject has extended to a greater length than I expected; I must therefore defer the remaining portion of my paper until our next meeting.

The following list of additions made to the Menagerie by gift and purchase, during the month of January, was read:—

1 Barbary Wild Boar	<i>Sus scrofa</i> , var. ....	Presented by	Captain Daubeny. W. Houlder, Esq. B. D. Gibbs, Esq. J. R. A. Douglas, Esq. H. Cooper, Esq. H. W. R. W. Halsey, Esq. Sir S. Morton Peto, Bt., M.P.
1 Bonnet Monkey ...	<i>Macacus radiatus</i> ...		
1 Macaque Monkey...	<i>Macacus cynomolgus</i>		
1 Indian Jackal .....	<i>Canis</i> .....		
1 Macaque Monkey ..	<i>Macacus cynomolgus</i>		
1 Polecat .....	<i>Putorius communis</i> ...		
1 Badger .....	<i>Meles taxus</i> .....		
1 Common Hare .....	<i>Lepus timidus</i> .....		
1 Bonnet Monkey ...	<i>Macacus radiatus</i> ...		
4 English Squirrels ...	<i>Sciurus vulgaris</i> .....		
1 Barnacle Goose.....	<i>Bernicla leucopsis</i> ...	Purchased.	
2 Golden Pheasants...	<i>Thaumalea picta</i> .....		
3 Sand Grouse.....	<i>Pterocles alchata</i> ...		
1 Common Kite .....	<i>Milvus regalis</i> .....		
1 Indian Civet .....	<i>Viverricula indica</i> ...		
1 Capuchin Monkey...	<i>Cebus apella</i> .....		
1 Bohemian Chatterer	<i>Ampelis garrula</i> .....		
1 Spider Monkey.....	<i>Ateles pentadactylus</i>		
2 Touracos .....	<i>Corythaix buffoni</i> ...		

The following list of additions made to the Menagerie by gift and purchase, during the month of February, was read:—

1 Herring Gull .....	<i>Larus argentatus</i> ...	Presented by	S. Redman, Esq. The Smithsonian Inst. Her Majesty the Queen. Viscount Hill. Viscount Hill. Capt. Rayner Wallace. Mrs. Sweetman.
2 Virginian Opossums ...	<i>Didelphys virginiana</i>		
1 African Leopard .....	<i>Felis leopardus</i> .....		
2 Barbary Deer .....	<i>Cervus barbarus</i> ...		
1 Crowned Crane .....	<i>Balearica pavonina</i>		
1 Entellus Monkey.....	<i>Presbytes entellus</i> ...		
1 Vervet Monkey .....	<i>Cercopithecus pyg- erythrus</i> .		
2 Golden Pheasants (fem.)	<i>Thaumalea picta</i> ...	Purchased.	
1 Guanaco .....	<i>Lama huanacos</i> .....		

March 13th, 1860.

Dr. Gray, V.P., in the Chair.

Mr. F. Buckland exhibited an embalmed Egyptian *Ibis*, and made some remarks upon the state of preservation of the animal as ascertained by dissection, and on the causes of the veneration of this species of bird by the ancient Egyptians.

Mr. Sclater exhibited specimens of *Oreophasis derbianus*, obtained by Mr. Osbert Salvin, Corresponding Member, on the Volcan de Fuego, Guatemala. Of the three examples, two were males and one a female. The female, which was previously unknown, differed from the male only in its slightly smaller size and the smaller development of the vertical protuberance.

Mr. Sclater also announced the arrival of two important acquisitions for the Society's Menagerie. A fine specimen of the Gigantic Salamander of Japan (*Sieboldia maxima*) had just been obtained from Capt. Charles Taylor of the ship 'Tung Yu,' by whom it had been brought to England from Japan. Capt. Taylor stated that he had purchased the animal in the market at Nagasaki on the 10th April, 1859, and had since kept it on board his vessel in a wooden tub. The second novelty was of a different class of Vertebrates. Mr. J. Petherick, H.M. Vice-Consul at Chartoum, had deposited in the Society's Gardens that day two living examples of the singular bird described by Mr. Gould before the Society in 1851\* under the name of *Balaeniceps rex*. These two birds, with a young male Hippopotamus, also at present placed under the care of the Society, were the sole survivors out of a noble collection of three African Elephants, two Rhinoceroses, four Hippopotami, a Monkey (*Colobus guereza*), and eleven birds, which had been prepared by Mr. Petherick for transmission to England.

Mr. P. L. Simmonds stated that he had received that day by the West African Mail a letter from his brother-in-law at Gaboon, dated January 14th last, and begged leave to communicate to the Members some information extracted from it, relating to the habits and temper of the Gorilla in a state of confinement. A fine specimen, which his brother-in-law had obtained, had died, and the skeleton, with that of a large adult female Chimpanzee, had been shipped for England. His brother-in-law was now again in possession of a very healthy young female Gorilla (the second, he believed, that had ever been captured alive). It was tame, lively, sensible, and not near so noisy or dirty as a Chimpanzee. It had grown an inch or two since he had purchased it, and seemed to be thriving well. Many people came to

\* See P. Z. S. 1851, p. 1. pl. xxxv.



the factory expressly to see it, and it was one of the "lions" of Gaboon; so little was known, even on the coast, of this animal by the natives.

Dr. Crisp exhibited some specimens and drawings of the *Cœnurus cerebralis* from the brains of the Common Sheep. One cyst measured 4 inches in length, and  $2\frac{1}{2}$  inches in its short diameter. It contained about three ounces of fluid. The *Echinococci* were all of an oblong form; they varied in size in different cysts, some being about  $\frac{1}{12}$ th of an inch in length, others from  $\frac{1}{20}$ th to  $\frac{1}{30}$ th of an inch. In some instances the parent-cyst was quite covered with them; in other examples they were arranged in groups of two or three hundred in each, and five or six of these masses were present in the same cyst. For the most part, their size was tolerably uniform, but a few were one-third or a half less than the others; this diminution of bulk appearing to depend upon an arrest of growth from the pressure of the contiguous entozoa. The rostrum and hooks were seen only in a few, and occasionally two heads existed. The body in many was faintly marked with transverse lines, but no trace of generative organs or of an alimentary canal was visible. On exposure to gentle heat, they became hard and granular. Dr. Crisp said he thought it somewhat doubtful whether these *Echinococci*, as supposed by many, were the young of a tape-worm; the matter, he believed, yet required much patient investigation.

The following extracts from the 'Bermuda Royal Gazette' of Jan. 31st, 1860, relating to the recent capture of a large species of *Gymnetrus* in the Bermudas, were read to the Society:—

"To the Editor of the 'Royal Gazette.'

"MY DEAR SIR,—As the Ichthyological specimen captured by Mr. George Trimmingham, at Hungary Bay, has attracted some public attention, perhaps a short description of the creature in question may prove interesting to your readers. I have therefore much pleasure in forwarding the following particulars.

"Believe me, very truly yours,

"J. MATTHEW JONES, F.L.S.

"The Hermitage, January 26th, 1860."

"Order ACANTHOPTERYGII. Family CEPOLADE.

"Genus *Gymnetrus*.

"——— ?

"Body attenuate, compressed, naked, tuberculate; cuticle a silvery covering of metallic lustre; length from facial to caudal extremities 16 feet 7 inches; depth, at 14 inches from facial extremity, 9 inches, increasing gradually to near the ventral extremity of the stomach, where it attained its greatest depth of 11 inches, and then decreased by degrees to the caudal termination; width, at the same distance

and through the spinal column,  $2\frac{1}{2}$  to 3 inches. (These dimensions are in the extreme.)

“From the frontal extremity of the caput (excepting a slight depression at the occiput) to the position at which the above dimensions of depth and width were taken, a gradual elevation of the dorsal ridge took place; and from the capital portion of this ridge arose at equal distances from each other a series of ten or eleven erect, quill-like, flexile filaments from 2 to 3 feet in extent, gradually tapering from base to apex, and possessing in the case of the three longest lanceolate points. From this series of lengthened filaments, all along the back, from head to tail, extended a series of intermittent fins so closely situate to each other as to present the appearance of a single fin, and having the spinose rays of each individual fin joined by the connecting membrane. Filaments and dorsal fin bright crimson. The ventral fins were entirely destroyed, save a portion of the *right* ventral, which is sufficient to show that it was composed of two consistent bony rays, which probably extended some distance from the body and must have formed a powerful engine of direction. The pectorals were also almost entirely destroyed, although the base of the *right* pectoral was sufficiently complete to enable me to state that it contained twelve spines. Anal and caudal fins absent.

“Head truncated, compressed; facial outline of a dark colour. Mouth so damaged as not to be positively determinable as regards form and appearance, but from the portions of jaw still remaining I should pronounce it malacostomous. Eyes, 14 lines in diameter, slightly depressed; irides,  $3\frac{1}{2}$  lines in width, of a bright silver, encircling pupils of a somewhat oval shape, and in colour a light transparent blue. Stomach: intestinal chamber extending from beneath the gills to the anal extremity, 5 feet; unfortunately this chamber had been opened and its contents partially injured before I saw the specimen, but a large portion of milt, intestine, &c. has been preserved, including the major portion of the swimming bladder, which for so large a fish may be considered small; its colour a bright scarlet; this swimming bladder contained a large amount of oily matter, and a piece thrown on the ruffled surface of the water immediately stilled the agitation. Gill-rays eight in number, four to a side, crimson, flabellate; the anterior pairs furnished with double rows of flabels, having the internals white, and armed on their inner side with minute dart-like appendages. Gill-covers bony, radiate, not entirely covering the gills. Teeth, no appearance of any.

“In concluding the above description, I must not omit to state that it was a male fish, and from the extremely fragile nature of its various parts I may venture to express an opinion that it had by no means attained maturity.

“I may also remark that my measurements were taken twenty-two hours after death, during which time the specimen had remained exposed on the rocky shore.

“*Remarks.*—This genus of Acanthopterygious fishes is of a form so thin and flat in proportion to its length as to have obtained among the ancient ichthyologists the name of Riband Fish. Although several

species are known to science, yet they are all of diminutive size in comparison with the individual now obtained. *Gymnetrus hawkenii*, *G. banksii*, and *G. glesne* are occasionally found in the British Seas.

“So little appears to be known of this singular tribe of fishes, that, even in the present advanced state of marine zoology, their habits, haunts, &c. remain blanks in the book of nature, and will probably long continue so, unless opportunities like the present should occur to enable us to add new facts to the history of these remarkable creatures.

“The most notable fact, however, in connexion with the capture of the present specimen will doubtless be the interest and attraction it will produce in the scientific world, for most assuredly we have in the specimen now before us many of the peculiarities with which the appearance of that hitherto apocryphal monster, the Great Sea Serpent, as detailed by navigators, is invested. The lengthened filaments crowning the caput, joined anteriorly by the connecting membrane and extending to the shoulders, would, viewed from a vessel's deck, present to the spectator the mane so accurately described as a singular feature in the gigantic specimen seen by Capt. M'Quhae, R.N., and officers of H.M.S. 'Dædalus.' Then, again, the rapidity with which that individual specimen moved through the water would coincide with the capabilities of a member of this genus, for the motive power produced by such an extent of tail, coupled with the extremely compressed form of body from the head throughout, must be immense.

“Here, then, we have a partial elucidation of the various statements which have at intervals appeared in the columns of the united presses of England and America, emanating from the pens of travellers, and usually headed 'Occurrence of the Great Sea Serpent,' criticised, however, in an ungenerous manner, and always exposed to an unmerited ridicule at the hands of the many, but nevertheless firmly believed in by the few, who have patiently waited to see the day when the mystic cloud which has hitherto veiled the existence of the maned denizen of the deep should vanish with the suspicion of the sceptic, and exhibit more clearly the truth of the assertions of those ill-used men, who, endeavouring like useful members of society to extend the cause of natural knowledge by publishing candid accounts of what their eyes have seen, have always met with an amount of contempt and reproach sufficient to silence for ever the pen of many a truthful writer.

“I am sorry I have not the number of the 'Illustrated London News' at hand in which Capt. M'Quhae's graphic statement appeared, as it would have afforded me an opportunity of particularizing other features in connexion with his specimen and the present one. The facts, however, regarding the mane-like appendage, and the rapidity of motion to which I have alluded, are still fresh in my memory.

“My best thanks are due to Mr. George Trimmingham, the capturer, for the generous manner in which he placed the fish at my disposal.”

The following papers were read :—

1. DESCRIPTION OF A NEW SPECIES OF ESTHERIA FROM NAGPOOR, CENTRAL INDIA. BY W. BAIRD, M.D., F.L.S.

(Annulosa, Pl. LXXI.)

Since my paper containing a description of a species of *Estheria* (*E. hislopi*) in the Proceedings of 1859, p. 231, was printed, I have received a short communication from Mr. Hislop, enclosing a second species of the same genus from the same locality. This species is considerably larger than *E. hislopi*, and differs from it entirely in shape and markings. The carapace is oval, flat, and compressed, rounded in front, where it is most convex, and considerably attenuated posteriorly. The umbo is situated near the anterior extremity; the ventral margin of the shell is rounded, and the dorsal margin, from the umbo to the posterior extremity, slopes downwards and is nearly straight. The carapace is encircled with prominent ribs, which are few in number (about seven or eight) and of considerable size. The intervening spaces are smooth, rather broad, generally convex in the centre, and do not present any of that elaborate sculpture which the other species from India (described and figured in the Proceedings of the Zoological Society, 1849) —*Estheria polita*, *E. similis*, and *E. boysii*—exhibit so distinctly; neither do they show the excavated punctations of *E. hislopi*. They are merely very slightly punctate. The specimens sent being preserved dry, the animal has not been observed.

“The specimens now sent,” says Mr. Hislop in his letter to me, “were obtained in shallow pools at Nagpür, Central India, about the middle of July, *i. e.* a month after the commencement of the rainy season there. If the pools dry up, as they frequently do, about the end of July, when there is a break in the Monsoon, the creatures perish, not to reappear that season, however copious may be the showers; but they are found in abundance at the beginning of the Monsoon in the following year. The orbicular species (*E. hislopi*) is not obtained along with the one above referred to, but occurs about the end of August in a stream which communicates with the large tank on the west of the city of Nagpür.”

The name I propose for this new species, the specimens of which unfortunately are not in a very good condition, is *Estheria compressa*.

ESTHERIA COMPRESSA. (Pl. LXXI. figs. 6, 6 a, 6 b.)

*Carapax compressus, ovalis, convex et rotundatus ad extremitatem anteriorem, ad extremitatem posteriorem attenuatus.*

*Margo ventralis rotundatus, margo dorsalis obliquus, fere rectus. Testa costata, superficie vix punctata.*

Length about 5 lines, breadth  $2\frac{1}{2}$ .

*Hab.* Pools of fresh water at Nagpoor, Central India.

*Mus.* Brit.

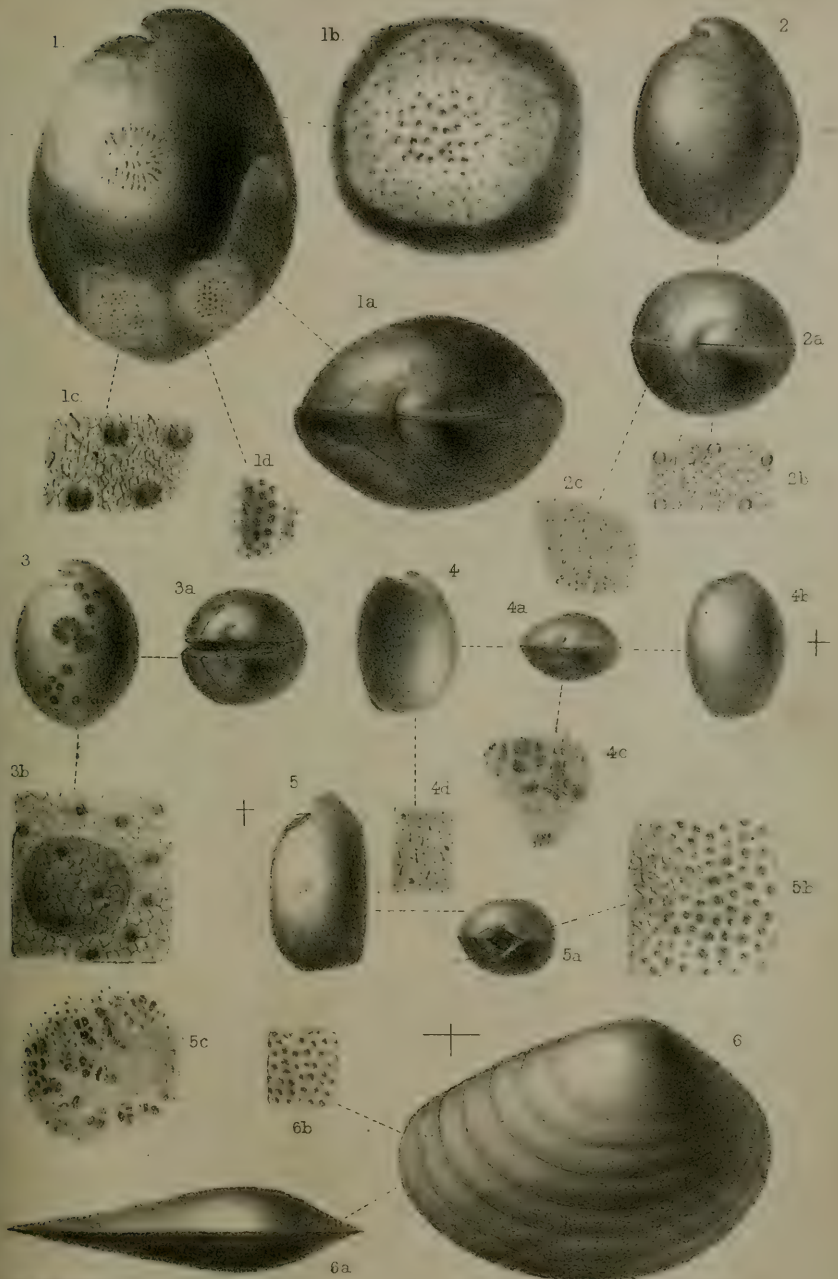


Fig 1, 1a-1d, *Cypridna albo-maculata*. 2, 2a-2c, *C. Godehevi*. 3, 3a, 3b, *C. Gorm*. 4, 4a-4d, *C. Norvegica*. 5, 5a-5c, *Philomedes longicornis*. 6, 6a-6b, *Estheria compressa*



2. DESCRIPTIONS OF THREE SPECIES OF MARINE SHELLS FROM THE PACIFIC OCEAN. BY W. HARPER PEASE.

1. NEPTUNEA FUSCO-LINEATA.

Shell fusiformly turreted, rather thin, shortly twisted at the base; epidermis thin, light, corneous; spire rather slender. Whorls nine, convexly angulated, ribbed longitudinally, and crossed by numerous transverse raised lines; ribs close, swollen, and becoming gradually obsolete on the back of the body-whorl; sutures well impressed; body-whorl convexly depressed above; canal short, slightly twisted to the left, and furnished with a slight umbilical fissure; labrum thin, simple; aperture oblong-oval, half the length of the shell; columella arched, smooth, glossy, slightly callous above. Colour whitish fawn, sparingly streaked longitudinally with brown, and ornamented with subequidistant revolving dark-brown lines.

*Hab.* Corea Sea. Dredged from sandy bottom, in 70 fathoms water.

2. TURCICA COREENSIS.

Shell conoidal, rather thin, subdiaphanous, of a light greyish fawn-colour, cinereous at the base, and sparingly marked with oblique stripes and small spots of a deep brown. Whorls flattened; body-whorl large, rounded at its periphery, all ornamented with transverse rows of close, irregular-sized papillæ or granules, which become almost obsolete near the base. Apex acute; suture canaliculated; base convex, imperforate; outer lip sharp. Aperture large, breadth and height equal, and pearly within. Columella oblique, with two obtuse tubercles on its edge.

*Hab.* Corea Sea. Dredged in company with the preceding species.

This species is closely allied to *T. monilifera* (A. Adams). It differs in the aperture being smooth within, and the whorls flat. The figure of *T. monilifera* also represents the sutural canal as being continued round the body-whorl. In the present species it terminates with the suture. The columella is also quite different, descending obliquely to the right.

There was dredged with the two preceding species a single right valve of a *Nucula*, which may possibly prove to be the *N. divaricata*, Hinds. It differs, however, from Mr. Hinds's description in being of an oval form, and in having the anterior teeth nine in number, posterior twenty-one. The epidermis is brown. Length 14, height 10 lines. Should this prove to be distinct from *N. divaricata*, we would propose for it the specific name of "*sculpta*."

3. CYPRÆA COMPTA.

Shell oblongo-ovate, rather solid; colour pale fawn-yellow, ornamented with somewhat remote, round, white spots of irregular size, and a flexuous dorsal line of same colour; sides and base white, the former conspicuously dotted with dark brown; extremities produced, the posterior curving to the left; umbilical region concave; right side margined; aperture narrow, flexuose; teeth small, even, twenty-

eight on the outer lip, not extending over the middle; columella teeth twenty-three, not so stout as those on the outer lip, forming an even line on the inner edge of the aperture; columella smooth, sulcated longitudinally, gibbous above and dentated on the extreme inner edge.

*Hab.* Jarvis Island.

The above species differs from *C. esontropia* in colour, being paler, and the spots, though similar in shape, are much more remote, the extremities more produced, and the flat depression on the middle of the outer lip is wanting in *C. esontropia*. The character of the teeth is quite dissimilar, as they are much smaller, greater in number, and do not run over the face of the columella. The absence of brown rings distinguishes it from *C. cumingii* and *C. gaskoinii*.

### 3. ON THE CAUSES OF DEATH OF THE ANIMALS IN THE SOCIETY'S GARDENS, FROM 1851 TO THE PRESENT TIME, 1860. BY EDWARDS CRISP, M.D.—(Part II.)

In addition to the remarks I made in my last communication on the diseases of the Mammalia, I may mention that biliary concretions in the gall-bladder have not been met with, although they are not uncommon in stall-fed oxen and in sheep fed upon much saccharine matter. Derangements and alterations in the colour and consistence of the bile, as shown by the specimens exhibited, are very common: this fluid was often found thick and treacle-like, and in one instance in an old *Leucoryx* (*Antelope leucoryx*) the gall-bladder was much enlarged, and contained 4 oz. by measure of dark-coloured bile. Calculi in the urinary bladder I have not met with, although this viscus has generally been examined. Eye-diseases are not uncommon, —cataract is often present. Of diseases of the ear I believe nothing is known in the lower animals; but it is probable that many cases of deafness and of disorganization of the auditory apparatus would be found, if the subject were inquired into.

Blood-diseases in mammals, birds, and reptiles, form one of the most interesting and instructive part of the inquiry; but my space will not allow me to enter fully into this matter. The blood is often found thick and treacle-like, the colour mottled, some of it often of a pinky hue; large concretions of fibrine often form in the cavity of the heart, and sometimes, I believe, are the means of prolonging life, by accommodating the size of the cavity to the diminished power of the circulating organ.

Since our last meeting, the death of the Red River-hog (*Potamochoerus penicillatus*) has afforded another example of the difficulty of arriving at a correct inference respecting the cause of death. The stomach of this animal was filled with a mass of short, tough straw, which probably the organ was unable to get rid of; the blood\*,

\* Dr. Halford, who took the heart home for investigation, confirmed this statement respecting the appearance of the blood; he found also some amount of inflammation of the lining membrane of the heart.



however, presented the mottled, pinky appearance before described ; under the microscope many of the corpuscles were irregular in shape, and some apparently disintegrated.

#### BIRDS.

Of these I have dissected many hundreds, but I need not enter minutely into the nature of their diseases. Affections of the liver and of the alimentary canal are the most common, and those of a tubercular character greatly preponderate. Tubercle in birds, I believe, is often very rapidly deposited, especially one form of it, viz. the nodular or albuminous. The liver, spleen, and intestinal tube often contain large masses of tubercular deposit, as shown in the specimens and drawings. This deposit in the lungs of birds is comparatively rare. In some of the *Raptores* I have found large tumours in the chest closely adherent to the ribs, and of a hard, fibro-tuberculous character. The viscera of some Wading birds (*Grallæ*), especially the Storks and Cranes, have offered the most remarkable deviations from normal structure in the shape of tuberculous and inflammatory products. In some instances I have been led to attribute the cause of death to the presence of a quantity of tough grass in the gizzard, which so interfered with the grinding process of the organ as to prevent a proper supply of chyle ; hence the diseased state of blood and other derangements that followed. Nails, buttons, pieces of wood, and other extraneous bodies in the gizzard, are very common, but I have not been able to discover any ill effects from them. In a Great Black-backed Gull (*Larus marinus*) that had been some time in the Gardens, a large fish-hook (by which probably the bird had been captured) was imbedded in the proventriculus.

Diseases of the kidneys are very common in birds, the weight of these organs in proportion to the body being greater than in any other class of animals,—*a fact, I believe, never stated before* ; but it serves to explain, in some degree, the prevalence of morbid changes in these viscera. The renal organs in birds in confinement are often enlarged, softened, fatty, and granular ; in some cases tubercular : but one of the most remarkable changes in connexion with the kidneys of birds is obstruction of the ureters, and occasionally a blocking up of the *cloaca* with *urate of ammonia* in a hardened state. This I have often met with, and I believe, combined with diseased blood, it is a frequent cause of death. Pericarditis (inflammation of the heart-bag) I have observed more frequently in this class than in any other ; frequently complete adhesion of the pericardium to the heart from old or recent inflammation is found crippling the action of the circulating organ. The internal cavities of the heart, too, often bear evidence of inflammation and its consequences.

Dropsy of the pericardium and of the thoracic air-cells, I have several times seen ; and the legs and feet of the long-legged birds, such as the Cranes, Storks, and Herons, are often œdematous.

Hydatids (*Echinococci*) of the liver and other viscera are of fre-

quent occurrence, and sometimes are of large size. Thus in the Crowned Pigeon (*Goura coronata*) one of these cysts in the liver contained more than 3 oz. of serous fluid. Some of them were occasionally filled with concrete biliary matter after the death of the *hydatids*. A good specimen of this was lately seen in the old Honduras Turkey (*Meleagris ocellata*) which died at the Gardens. Diseases of the feet, as in caged birds, are of frequent occurrence, especially among the perchers. The toes get stiff and contracted, the nails are sometimes lost, and occasionally the feet are affected with a kind of dry gangrene. Excrescences from the abnormal production of cuticle are likewise very common.

*Entozoa* and *Epizoa* are very numerous, in diseased animals especially: but, as I intend to bring this matter before the Society in a separate paper, I need only mention it here. *Pediculi* in birds are often very abundant—these parasites, like some in human shape, appearing to flourish best where corruption is most rife; but in the viscera of birds I have often found a lower form of life, existing I believe long before death, viz. the presence of *fungi*. I have not only met with the sporules of mould in the tubercular lungs (as others have described before me), but I have seen them also upon deposits of lymph in the abdomen.

#### REPTILES.

In the *Chelonians* it is often difficult to ascertain the cause of death, many of them apparently being a long time dying, and frequently death not being detected until some days after dissolution; so that I have not been able to arrive at any satisfactory evidence as to the morbid changes. In a few instances I have seen small tubercles of the liver.

*Saurians*.—The same remark respecting the morbid changes will apply to *Loricata*; in these, however, I have found more satisfactory evidence of disease, the tubercular being the most frequent lesion. As I stated some time since at the Society, in ten Alligators and Crocodiles that I examined, the stomachs of all contained stones and pieces of wood, and in two others since inspected I have found the same substances.

In some of the Lizards I have seen the intestines obstructed with hard feculent matter. In a large Iguana the intestinal tube was blocked up with grape-stones. The death of one of the Lizards (*Uromastix spinipes*) arose partly from bleeding from the lungs. The reptile in question, the lungs and liver of which were studded with tubercles, was put into a warm bath—rather a strange mode of treatment for a cold-blooded animal—and hæmorrhage was the result. Let me make one observation about the temperature of the Reptile-house. None of the reptiles here are cold-blooded, their bodies being of a like temperature with that of the surrounding atmosphere; and the same remark will apply to those living in hot climates. The time some reptiles will go without food, and without any apparent diminution of bulk, is also a circumstance worthy of note. I dissected a Python (*Python molurus*) that had not fed for ten months;

and even more extraordinary examples than this could be adduced. To return to the diseases of the Lizards, I may add, that the tubercular are the most common.

*Ophidians*.—In this division one of the most remarkable and peculiar diseases is found. It will be remembered that a few years since a great mortality occurred among the serpents; nearly all of them died, and I had an opportunity of examining a great many of them. The disease, which I believe is highly contagious, consists of ulceration of the lining membrane of the mouth, and the deposit of masses of semitubercular matter in different parts of the intestinal tube, but chiefly in the rectum, blocking up the canal, and producing obstruction. With this form of disease there is also a peculiar condition of the blood. Some of the reptiles dying of this affection were very fat, especially the Puff Adders (*Crotalaria*).

Tubercles in the liver, lungs, and other parts in the Ophidians, are very frequently met with. In the Boa which some years ago was said to have swallowed a blanket, it will be seen by the drawings now exhibited that the lungs and liver were thickly studded with small miliary tubercles; but the immediate cause of death was inflammation of the pericardium (heart-bag): upon this, and hanging from it, were large flakes of lymph partly organized.

*Batrachians*.—I have had but few opportunities of examining specimens of this order soon after death, and therefore cannot speak of their diseases.

I may make one observation respecting the reparative power in the reptiles. In many of them it is very rapid. In a Boa that had its tail accidentally jammed off, the part was very quickly repaired; and I have seen many instances of the same kind in reptiles; and, if the accounts are to be believed, the large Salamander (*Sieboldia maxima*) just obtained by the Society will reproduce its extremities—bone, muscle, integument, and other parts.

In bringing this imperfect sketch to a conclusion, I may observe that my time and space have been too limited to do justice to the subject; but I trust that the information conveyed will not prove altogether unprofitable.

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March 27, 1860.

Professor Busk, F.R.S., F.Z.S., &c., in the Chair.

Mr. John Petherick exhibited the head and horns of a rare Antelope from Central Africa (*Antelope leucotis*, Licht., Mem. Acad. Berol. 1854, p. 99).

The Secretary exhibited an egg of the King Vulture (*Gyparchus* No. 429.—PROCEEDINGS OF THE ZOOLOGICAL SOCIETY.

*papa*), laid in the Society's Gardens. This was believed to be the first well-authenticated specimen known of the egg of this Vulture. The shape was oblongo-ovate, considerably pointed towards the smaller end; the colour pure white; length 3·7 inches, breadth 2·65. As the egg was supposed to be impregnated, it was in contemplation to attempt to hatch it under a hen of the domestic fowl.

The Secretary also exhibited a second egg laid by the female *Apteryx mantelli* in the Society's Gardens in February last. It differed but slightly from that previously produced by the same bird, being merely somewhat larger.

The following papers were read :—

1. REMARKS ON THE STOMACH OF THE POTAMOCHÆRUS PENICILLATUS. BY T. HOWARD STEWART, F.Z.S.

The stomach of the *Potamochoærus* has the usual type of structure, such as exists in all the *Artiodactyla*. It is divided partially into three compartments, viz. the *cardiac sacculus*, situated to the left of the cardiac or œsophageal opening; the *cuticular* portion around the cardiac orifice; and the digestive or *pyloric* division: these communicate freely with one another.

This stomach differs from that in the genus *Sus* in having the cardiac sacculus larger, and in the cuticular layer around the œsophageal opening being somewhat different in arrangement.

In *Potamochoærus* the cuticular portion is well defined, and has a raised crenulated margin, and its entire surface much wrinkled. Microscopically, it shows an epithelial structure, which is raised on the surface into conical papillæ, such as are seen on a larger scale in the reticulum of Ruminants.

In *Sus* the cuticular portion is not so markedly distinct from the mucous or digestive portion; it has, however, a defined and slightly raised non-crenulated margin; the surface is quite smooth, and of a white non-vascular colour.

It becomes a question of interest, in examining the arrangement of the stomach in these Artiodactyles, as to what may be its function in the digestive process. I believe that the food, first passing into and being mixed with the secretion from the cardiac sacculus, goes on to the cuticular portion of the stomach, and undergoes there a kind of maceration, and is then forwarded to the pyloric or true digestive portion of the viscus. May not this cuticular part of the stomach be analogous to the *reticulum* or second cavity in the stomach of the true Ruminants? This peculiar lining of a portion of the stomach exists in all the Pachyderms, in the Horse, and in all the Artiodactyles, and also in the Kangaroo, under various modifications. The Kangaroo has been known to ruminate when fed on hard food; may not an occasional act of rumination take place in this *Potamochoærus*, and others of the same class? The cuticular

layer is more developed in the *Potamochoærus* than in other animals of the class I have been able to examine; from this we may infer that this animal is of a more vegetable-eating nature than our omnivorous Hog.

2. NOTE ON THE FOX OF JAPAN. BY ARTHUR ADAMS, F.L.S.

The Fox of Japan is quite a distinct species from that of China, specimens of which I procured on the banks of the Wusung River, near its junction with the Yang-tze-kiang. The Japanese species, four skins of which were obtained by Mr. Bedwell from Niegata in Nippon, has black ears lined with white, and a black spot on the upper surface near the base of the tail. The colour of the fur on the neck and back is ferruginous, and is much softer and longer than that of the Foxes of Europe and China, and the brush is also longer and thicker.

3. MEMORANDA ON THE HIPPOPOTAMUS AND BALÆNICEPS RECENTLY IMPORTED TO ENGLAND, AND NOW IN THE GARDENS OF THE ZOOLOGICAL SOCIETY. BY JOHN PETHERICK, F.R.G.S., H.M. CONSUL FOR THE SOUDAN.

Since 1853 I have devoted from six to seven months of each year to the exploration of some of the unknown regions of Central Africa.

My starting-point, Khartoum, at the junction of the Blue and White Niles, in lat.  $15\frac{1}{2}^{\circ}$  N., a town of about 60,000 inhabitants, is the capital of seven provinces dependent on Egypt, called the Soudan, consisting of the whole of that, for the most part sandy, district between the second Nile cataract at Wadi Halfa and the territories inhabited by the naked negro in  $13^{\circ}$  N. lat.; whilst its breadth extends from the borders of Darfour on the west to the shores of the Red Sea and Abyssinia on the east.

Leaving Khartoum, and navigating the White Nile to between  $9^{\circ}$  and  $10^{\circ}$  of N. lat., a narrow channel, and for the most part overgrown with reeds, which by former Nile navigators had been considered unnavigable, attracted my attention, and pursuing it, not without difficulty finding my way through some narrow openings in a forest of reeds, I found this to be the connexion between a large lake and the Nile, of which it is one of the most important feeders hitherto known.

This lake, according to the time it occupied me to sail in a well-appointed boat with three large latteen sails, from one extremity of it to the other, after making allowance for the windings of the open passages through the dense vegetation with which it is for the most part covered, I consider to be about 180 miles long, and perhaps some 60 miles wide.

Its waters, ornamented with several promontories and islands,

more or less wooded with sycamores, acacias, and mimosas, and but little frequented by man, literally swarm with Crocodiles and Hippopotami.

The latter in particular made many rude and uncouth attempts to dispute the right of passage over their hitherto secluded home, by attacking my boat, battering-ram fashion, both under and on the surface of the water; and on one memorable occasion, to the surprise and horror of all on board, a huge beast, suddenly raising half its great carcass with an agility hardly to be expected out of the water, close under the bows, carried off my unfortunate cook from the gunwale on which he was sitting, one bite of the animal's powerful jaws sufficing to sever his body in two at the waist.

It was here, whilst returning in the month of April in the year 1858 from the regions of the equator, where I founded an establishment of twenty-five men (Arabs from the neighbourhood of Khartoum), for the barter of elephants' tusks with the aborigines, the Niam Niams, that the "look-out" at the mast-head, almost frantic with excitement, called out "A young Hippopotamus," pointing to the reeds within a few yards of which we were sailing. A dozen of my sailors leaped into the water, and, disappearing amongst the thick herbage, soon returned, one of them grasping in his arms a young animal about the size of a spaniel, and kept afloat and propelled towards the boat with shouts of delight by his companions.

Fortunately for the safety of the men, the old lady Hippopotamus was not at home, and so distant from her charge as not to hear the cries of her baby (similar to those of a young calf), or the affair might not have terminated so favourably. A piece of the navel-string, 15 inches long, was still dangling to its body, and did not detach itself for several days afterwards; from which I inferred its birth could not have extended over a day or two.

The unexpected but welcome guest was reared on milk, and in its absence with meal and water, being treated with all the attention we could bestow on it, and is now, judging from its thriving condition, as grateful as its owner for the hospitality it is enjoying at your splendid Gardens in the Regent's Park.

So large a sheet of water as the "Bahr il Gazâl" will naturally attract great numbers of the feather tribe, and it was in this lake that I first made the acquaintance of a very handsome Stork (*Myceteria senegalensis*) and the *Balaniceps*.

Of both these rare birds I was fortunate enough to procure living specimens; the former of which, with numerous rare animals, such as the Elephant, Rhinoceros, two species of Ant-Bears, a rare Monkey, and I believe a new species of Antelope, unfortunately died during the long and arduous journey from Central Africa through Egypt to the Mediterranean.

The skin of the Stork, however, has been preserved, with a few other skins of birds, a remnant of a large collection made between the 5th and 15th degrees of N. latitude, but unfortunately lost in the Upper Nile-cataracts of Nubia. The few skins alluded to as having been saved have been examined by your obliging Secretary,

Mr. Selater, to whom I am indebted for many acts of kindness since my return to England\*.

Two living specimens out of six *Balæniceps* shipped at Khartoum (but perhaps out of a score partially reared, the first, as you are well aware, imported into Europe) have, almost against hope, survived the apparent insurmountable difficulties of the trying journey across nearly one-half the continent of Africa, and are at length, I am proud to say, safely housed in your commodious Gardens.

The *Balæniceps*, although found only in or near water, is but rarely seen on the banks of the Nile, and then only during a short period of the year, when the interior is dried up, in the summer, during the short hot season preceding the rains.

It prefers the natural tanks and morasses of the interior, where the shallowness of the water distributed over a large surface affords it greater facilities for wading than the banks of the Nile. These frequently shelve off into deep water more or less abruptly, and thus furnish but comparatively few spots favourable to the support and habits of the bird.

For this reason, at about 100 miles west of the Nile, in from 5° to 8° N. lat., at Gaba Shambyl, where I have a station of elephant-hunters, these interesting birds exist in greater numbers than on the Nile, or the comparatively deeper waters of the Bahr il Gazâl, the lake to which I have alluded, and of which I have the honour of being, if not, strictly speaking, the discoverer, at least the first navigator.

At Gaba Shambyl, striking off directly west from the Nile, the country for the first 30 miles rises with an almost imperceptible slope, when it again decreases in elevation for a distance of 60 to 70 miles. Here it becomes a large morass, with occasionally dry spots, which form so many islands in a sheet of water after the annual rains, that from north to south extends probably over 150 miles, having no outlet directly to the Nile, but, when the water is at a certain height, overflowing into a channel connecting it with the Bahr il Gazâl. This reservoir, which is more or less supplied with water all the year round, abounds in reeds and thick bush, and is the favourite retreat and home of the *Balæniceps*.

\* Mr. Petherick's skins are in a condition which renders their specific determination rather difficult. The most noticeable are,—

<i>Haliaëtus vocifer</i> , juv.	<i>Pœocephalus meyeri</i> , Rüpp.
<i>Halcyon semicærulea</i> (Gm.)?	<i>Læmodon vielloti</i> .
<i>Coracias abyssinica</i> (Linn.).	— <i>leucocephalus</i> , De Fil.
<i>Merops ægyptius</i> ?	<i>Edicnemus affinis</i> , Rüpp.?
<i>Bucorax abyssinicus</i> .	<i>Cursorius</i> , sp.?
<i>Lanius macrocercus</i> , De Fil.	<i>Falcinellus igneus</i> .
<i>Prionops cristatus</i> , Rüpp.	<i>Ardeola bubulcus</i> .
<i>Laniarius chrysogaster</i> , Sw.	<i>Nycticorax europæus</i> .
— <i>erythrogaster</i> , Rüpp.?	<i>Anastomus lamelligerus</i> .
<i>Lamprotornis purpuroptera</i> , Rüpp.	<i>Mycteria senegalensis</i> .
<i>Notauges superbus</i> , Rüpp.	<i>Parra africana</i> .
<i>Colius senegalensis</i> ?	<i>Plectropterus rüppellii</i> , Selater.
<i>Schizorhis zonura</i> , Rüpp.	<i>Sterna</i> (2 sp.).

—(P. L. S.)

The birds here are seen in clusters of from a pair to perhaps one hundred together, mostly in the water, and when disturbed will fly low over its surface, and settle at no great distance; but if frightened and fired at, they rise in flocks high in the air, and, after hovering and wheeling around, will settle on the highest trees, and as long as their disturbers are near will not return to the water. Their roosting-place at night is, to the best of my belief, on the ground. Their food principally is fish and water-snakes, which they have been seen by my men to catch and devour. They will also feed on the intestines of dead animals, the carcasses of which they easily rip open with the strong hook of the upper bill. The breeding-time of the *Balaniceps* is in the rainy season, during the months of July and August, and the spot chosen is in the reeds or high grass immediately on the water's edge, or on some small elevated and dry spots entirely surrounded by water. The birds before laying scrape a hole in the earth, in which, without any lining of grass or feathers, the female deposits her eggs. As many as a dozen eggs have been found in the same nest. Numbers of these nests have been robbed by my men of both eggs and young, but the young birds so taken have invariably died. After repeated unsuccessful attempts to rear them and more trouble than you can imagine, after two years' perseverance I at last succeeded in hatching some eggs under hens, which, at a considerable distance from Gaba Shambyl, I procured from the Raik negroes. As soon as I got the hens to lay, and in due time to sit, by replacing several of their eggs with half the number of those of the *Balaniceps*, as fresh as possible from the nest, the locality of which was previously known, I eventually succeeded in hatching several birds. These ran about the premises of my camp, and, to the great discomfort of the poor hens, *would* persist in performing all sorts of unchicken-like manœuvres with their large beaks and extended wings in a small artificial pool constantly supplied with water by several negroesses retained in my service for their especial benefit. Negro boys of the tribe (the Raik) were also employed to supply their little pond with live fish, upon which, and occasionally the intestines of animals killed for our use, chopped into small pieces, they were reared.

As may be supposed, the birds became the pets of my "Bizouks," as I frequently called my Khartoumers; and as they grew up, with extended wings and a rattle-like noise produced by the snapping of their bills, they would follow them round the large enclosure of my camp.

During their journey to England, six months' confinement in a cage has greatly affected their health, and I dare say soured their tempers; at least, such to a certainty would be the effects on myself if placed in a similar predicament. But, in common with, I venture to say, every one connected with the Society, I trust that my attention and trouble, to say nothing of the expense which I have been put to,—although perhaps a more important feature than most of you may be aware of,—may be rewarded by their recovery and well-being; and I hope if, as there will be no difficulty on my part, they become the



property of the Society, they will long live to adorn, and perhaps enhance, the merits of the rare collection amongst which they are at present, with their countryman the Hippopotamus, so hospitably received.

4. NOTE UPON THE GENUS CYPRIDINA, MILNE-EDWARDS, WITH  
A DESCRIPTION OF SOME NEW SPECIES. BY W. BAIRD,  
M.D., F.L.S.

(Annulosa, Pl. LXXI.)

The genus *Cypridina*, belonging to the Ostracod Order of the Entomostracous Crustacea, was founded by Milne-Edwards in 1838, in Lamarck's 'Hist. Nat. An. s. Vert.' vol. v., in a note to the genus *Cypris*. It was afterwards more fully detailed in his 'Hist. Nat. Crustac.' vol. iii. At the time of the publication of that work only one species was known; now there are about twenty, and in the paper now before the Society I propose adding four more. The species already described are—

1. CYPRIDINA REYNAUDII, M.-Edwards, Hist. Nat. Crust. iii. 409. t. 36. f. 5, 1840.

2. C. ELLIPTICA.

*Asterope elliptica*, Philippi, Archiv. f. Naturg. vi. 1. p. 186. t. 3. f. 9-11, 1840.

3. C. MEDITERRANEA, Costa, Agli Scienz. d'Ital. 57. t. 1. f. 1-13, 1845.

4. C. MACANDREWII, Baird, Ann. & Mag. Nat. Hist. 2nd ser. i. 21. t. 6 B. f. 1-7, 1848.

5. C. ADAMSI, Baird, Ann. & Mag. Nat. Hist. l. c. t. 7, 1848.

6. C. BIMACULATA.

*Cypris bimaculata*, Nic. Gay, Hist. Fisic. de Chile, iii. 294. t. 4. f. 6, 1849.

7. C. CÆRULEA.

*Cypris cærulea*, Nic. Gay, Hist. Fisic. de Chile, t. 4. f. 66, 1849.

8. C. BRENDA, Baird, British Entomostraca, 181. t. 23. f. 1, 1850.

9. C. ZEALANDICA, Baird, Proc. Zool. Soc. 1851, t. (Annulosa) 17. f. 11-13.

10. C. INTERPUNCTA, Baird, Proc. Zool. Soc. l. c. t. 17. f. 8-10.

11. C. MARIÆ, Baird, Proc. Zool. Soc. l. c. t. 17. f. 5-7.

12. *C. GLOBOSA*, Liljeborg, Cladoc. Ostrac. Copepod. in Scania occur. 171. t. 17. f. 2-10, 1853.

13. *C. GIBBOSA*, Dana, Crustacea of U. S. Explor. Exped. xiv. 1295, t. 91. f. 4, 1853.

14. *C. FORMOSA*, Dana, Crust. U. S. Explor. Exped. *l. c.* 1296. t. 91. f. 5, 1853.

15. *C. LUTEOLA*, Dana, Crust. U. S. Explor. Exped. *l. c.* 1291, t. 91. f. 1, 1853.

16. *C. PUNCTATA*, Dana, Crust. U. S. Explor. Exped. *l. c.* 1293, t. 91. f. 2, 1853.

17. *C. EXCISA*, Stimpson, Invert. of Grand Maun, Smithson. Contrib. to Knowledge, t. 2. f. 28, 1854.

= *C. brenda*, Baird, 1851, *vide* specimens.

18. *C. OBLONGA*, Grube, Archiv. f. Naturg. 1859, 335. t. 12. f. 2, 3, 1859.

#### PHILOMEDES, Liljeborg.

19. *P. LONGICORNIS*, Liljeborg, Cladoc. Ostracod. Copepod. in Scania, t. 26. f. 4, 5, 1853.

20. *P. OLIVACEUS*.

*Cypridina olivacea*, Dana, Crust. U. S. Expl. Exped. *l. c.* 1294. t. 91. f. 3, 1853.

Of the new species about to be described, one is a native of Europe, two of the Indian Ocean, and one of Australia.

1. *CYPRIDINA NORVEGICA*, Baird. (Pl. LXXI. figs. 4, 4 a-4 d.)

Carapace-valves oval, somewhat compressed, smooth and shining. The notch or sinus at the anterior extremity is not deep; the beaks are small and somewhat thickened round the margins. The dorsal margin is gently rounded; the ventral is slightly arched, projecting at its upper extremity immediately beneath the notch, and at its inferior extremity is rather sharply gibbous or prominent, which, seen from internal surface, shows a duplicature of the shell. The surface is polished, not punctured, and is of a straw-colour. In shape it appears to resemble very much the *Cypridina luteola*, of Dana\* from the Sooloo Sea. The shell, however, is *ovate*, not *ovoid*; and the inferior extremity, instead of being rounded, is gibbous or projecting anteriorly.

Length  $1\frac{1}{2}$  line; breadth 1 line.

*Hab.* Coast of Norway (*R. M'Andrew, Esq.*).

*Mus.* Brit.

2. *CYPRIDINA GODEHEVI*, Baird. (Pl. LXXI. figs. 2, 2 a-2 c.)

Carapace-valves oval and ventricose, produced into a point at the

\* United States' Exploring Expedition, Crustacea, vol. xiv. p. 1291, pl. 91. f. 1.

posterior extremity. The anterior extremity is rather narrower than the posterior; the sinus or notch is rather deep, the beaks are sharp-pointed and thickened along the margins. The surface is marked with numerous, minute punctations, and is of a deep yellow or saffron colour.

Length 3 lines; breadth 2 lines.

*Hab.* Madras, in 8 fathoms. From the Collection of Mr. Cuming.  
*Mus. Brit.*

In the 'Mémoires pour les Savans Étrangers,' vol. iii. p. 269, there is an exceedingly interesting communication from M. le Commandeur Godeheu de Riville on the luminosity of the sea. In that paper he describes and figures a little creature which he found was the cause of this luminous appearance. The body of the animal, he says, was contained in a small, transparent shell, resembling in form that of an almond cleft down the side, and which was notched at its upper part. This shell, though roughly figured, pretty accurately represents this species of *Cypridina*, and I have little doubt our species is the same as Riville there describes and figures. The part of the ocean where he met with it was off the coast of Malabar.

### 3. CYPRIDINA OVUM, Baird. (Pl. LXXI. figs. 3, 3 a, 3 b.)

Carapace-valves of a perfect ovoid shape, and very ventricose. Anterior extremity slightly narrower than posterior. The surface of the valves is marked with exceedingly minute punctations, with numerous, round, quite smooth spots, of a brownish-yellow colour, distributed over it, appearing as if they were excavated out of the surface of the shell. The notch at the anterior extremity is rather deep; the beaks are somewhat pointed, slightly incurved and thickened along the margins; and the posterior extremity is rounded without any appearance of gibbosity.

Length  $1\frac{1}{2}$  line; breadth  $1\frac{1}{4}$  line.

*Hab.* Chinese Seas. Collected by Sir E. Belcher, C.B. From the Collection of Mr. Cuming.

*Mus. Brit.*

### 4. CYPRIDINA ALBO-MACULATA, Baird. (Pl. LXXI. figs. 1, 1 a, 1 b, 1 c, 1 d.)

Carapace-valves of an ovate-ventricose form, rounded on the dorsal and ventral margins, and slightly, but distinctly, produced into a point in the centre of the inferior extremity. The surface is marked with numerous, small, distinct punctations, and conspicuously blotched with several large, bright white patches, which are slightly raised and strongly punctured. There are only two large ones on the right valve, and three on the left. The notch at the anterior extremity is rather deep, and the edges of the beak are incurved, pointed, and thickened along the margins. The anterior extremity is rather narrower than the posterior.

Length 4 lines; breadth 3 lines.

*Hab.* Swan River. From the Collection of Mr. Cuming.

*Mus. Brit.*

5. *PHILOMEDES LONGICORNIS*, Liljeborg. (Pl. LXXI. figs. 5, 5 a, 5 b, 5 c.)

Carapace-valves of a squarely-ovate shape, somewhat compressed, and covered with numerous, very small punctations. The notch at the upper extremity is wide and deep, and the beaks are obtuse and fringed along the margin. The posterior extremity is square-shaped, with a slight projection at the anterior corner. The superior antennæ are provided with two very long setæ. When in fluid, there is a small, roundish, black mark visible on each of the valves, near the centre, but a little nearer the anterior extremity. This species was taken in the towing-net, in Whale Sound, by Dr. Sutherland in 1852, who remarks in his notes of the voyage that the animals often come springing up from the bottom to the surface of the vessel in which they were placed after their capture; their motions then ceased, and they again sank to the bottom. It was described by me about the end of the same year under the name of *Cypridina isabella*, after the ship in which Dr. Sutherland was, and which at the time was engaged in the unsuccessful search after Sir John Franklin. My description, however, remained in MS., and my attention was some time afterwards called to the work of W. Liljeborg on the 'Entomostraca of Sweden,' published in 1855. At page 176 he describes an animal which I consider identical with this, found by him on the coast of Sweden, and which is figured in plate 26, figs. 4, 5. From its possessing two very long setæ on the superior antennæ, and wanting the appendage on the second pair of maxillæ, he has formed a distinct genus for it under the name of *Philomedes*.

Length  $1\frac{1}{2}$  line; breadth  $\frac{1}{2}$  line.

*Hab.* Whale Sound, lat.  $77^{\circ}$  N., long.  $71^{\circ} 37'$  W. (*Dr. Sutherland*).

EXPLANATION OF PLATE LXXI.

- Fig. 1. *Cypridina albo-maculata*. 1 a. Ventral view. 1 b. One of the white spots, magnified 15 diameters. 1 c. Portion of the surface, magnified 75 diameters. 1 d. Dark portion of lucid spot.
- Fig. 2. *Cypridina godehevi*. 2 a. Ventral view. 2 b. Portion of surface, magnified 75 diameters. 2 c. Lucid spot, magnified 75 diameters.
- Fig. 3. *Cypridina ovum*. 3 a. Ventral view. 3 b. Portion of surface, magnified 75 diameters.
- Fig. 4. *Cypridina norvegica*. 4 a. Ventral view. 4 b. Interior of valve. 4 c. Lucid spot, magnified 75 diameters. 4 d. Portion of surface, magnified 75 diameters.
- Fig. 5. *Philomedes longicornis*. 5 a. Ventral view. 5 b. Portion of surface, magnified 75 diameters. 5 c. Lucid spot, magnified 75 diameters.
- Fig. 6. *Estheria compressa*. 6 a. Ventral view. 6 b. Portion of surface between the ribs, magnified 75 diameters.

5. DESCRIPTION OF A NEW GENUS OF FRESHWATER BIVALVE MOLLUSCA, BELONGING TO THE FAMILY CORBULIDÆ, FROM THE COLLECTION OF HUGH CUMING, ESQ. BY HENRY ADAMS, F.L.S.

Genus HIMELLA, H. Adams.

*Testa tenuis, inæquilateralis, inæquivalvis, valva sinistra majore, clausa, parva constrictione ab umbonibus ad marginem ventralem extendente, epidermide vestita; umbonibus tumidis, obtusis. Cardo in valva dextra dente obscuro, in valva sinistra fossa congruente; ligamento externo; cartilagine interna, in cartilaginis processu angusto, sub-horizontali in utraque valva recepta. Linea pallialis vix sinuata.*

Shell thin, inequilateral, inequivalve; the left valve the larger, closed, with a slight constriction extending from the beaks to the ventral margin, covered with an epidermis; beaks tumid, obtuse. Hinge composed of an obscure tooth in the right valve, with a corresponding cavity in the left valve; ligament external; cartilage internal, contained in a narrow, almost horizontal, cartilage-process in each valve. Pallial line slightly sinuated.

HIMELLA FLUVIATILIS, H. Adams.

*H. testa transverse oblonga, antice rotundata, postice truncata, margine superiore sub-recto; valvis externe rugosis, epidermide pallido-fusca; umbonibus sub-anterioribus, decorticatis.*

Shell transversely oblong, rounded anteriorly, truncated posteriorly, the superior margin nearly straight; surface of valves rugose, covered with a light-brown epidermis; beaks subanterior, eroded.

Long. 10, lat. 6, cras. 4 lin.

*Hab.* River Marañon.

This interesting genus appears to have greater affinity with *Azara*, D'Orbigny, than with any other member of the *Corbulidæ*; but differs considerably from that genus in the form and texture of the shell, the thinness of the valves, and the disposition of the cartilage-processes of the hinge. In its habits also it is truly fluviatile, being found in the River Marañon, whence Mr. Cuming's specimens were obtained by Mr. Bates.

6. NOTE ON THE BLOOD-CORPUSCLES OF THE JAPANESE GI-GANTIC SALAMANDER (*SIEBOLDIA MAXIMA*). BY EDWARDS CRISP, M.D., F.Z.S., ETC.

The blood-corpuscles of this animal in their general aspect, irrespective of size, bear a great resemblance to those of the Water-newt (*Triton cristatus*). They vary much in diameter, some being from a third to a fifth smaller than the majority. They are of a bright straw-colour, which colour they retain when dried on the glass; the nucleus and nucleoli being of a lighter hue and more transparent. The blood also contains innumerable transparent vesicles of an ellip-

tical shape, about one-third the size of the human blood-corpusele; but, as the skin of the reptile is abundantly covered with slimy mucus, it is probable that in taking the blood (a very small quantity of which was obtained) the mucus was mixed with it, and produced these vesicles, which differ from any that I have seen in the blood of other reptiles.

With the blood of the Salamander I examined that of the Waternewt (*T. cristatus*) and that of the Common Frog (*R. temporaria*), both reptiles being alive. The drawings of the corpuscles which I exhibit will give the relative sizes; they are all magnified 500 diameters. I have also added a drawing of the human blood-corpusele, by way of comparison. In these illustrations the largest corpuscles, which are far more numerous than the others, have been selected.

They measure as follows:—

	Fractions of inch in diameter.	
Blood-corpusele of Man . . . . .	$\frac{1}{3350}$ .	
	Long diameter.	Short diameter.
Blood-corpusele of <i>Sieboldia</i> . . . . .	$\frac{1}{600}$ to $\frac{1}{490}$	$\frac{1}{1000}$ to $\frac{1}{870}$ .
Nucleus of same . . . . .	$\frac{1}{930}$	$\frac{1}{1860}$ .
Blood-corpusele of <i>Triton cristatus</i> . . . . .	$\frac{1}{860}$	$\frac{1}{1830}$ .
Blood-corpusele of <i>Rana temporaria</i> . . . . .	$\frac{1}{1020}$	$\frac{1}{2100}$ .

The most interesting and important circumstance connected with this examination, is that this Salamander, a non-perennibranchiate\* reptile (as I believe), probably has a blood-corpusele as large, or nearly as large, as the Proteus and Siren, reptiles which retain their gills.

In the excellent and original papers by Mr. Gulliver in our 'Proceedings' for 1845 and other years, "On the size of the Red Corpuscles of the Blood in the *Vertebrata*," that gentleman infers that, "although there is no relation between the size of the corpuscle and that of the animal in different orders, in the same order the largest species have generally larger corpuscles than the smallest species. Thus in the large Ruminants the corpuscles are distinctly larger than in the smaller; and the same fact is observable in the Rodents. In these examples the gradation in the size of the corpuscles may not exactly follow that of the animals; but none of the very small species have corpuscles so large as those of the largest species."

The examination of the blood of this reptile is probably another confirmation of the general correctness of Mr. Gulliver's opinion; but in my examination of the blood-corpuseles of a great many species of vertebrate animals I have found several deviations from this law, more especially in the Ophidian reptiles and in the Osseous fishes; among the Ruminants too, many of the smaller Antelopes have larger corpuscles than the Giraffe. In some of the *Cervidæ* the size of the corpuscle does not correspond to that of the animal. In the *Ophidia*

\* It has been shown by Van der Hoeven that the *Sieboldia* is a true Perennibranchiate, although there is no gill-aperture present, or rather it has early disappeared. See his 'Zoology' (Clarke's translation), ii. 242.—P. L. S.

there are likewise several exceptions; but the osseous fishes, I believe, afford numerous examples, especially among the *Salmonidæ* and *Scomberidæ*. Thus I have recently examined the blood of the Common Tunny (*Thynnus vulgaris*), weighing about 320 lbs., and the corpuscles were rather smaller than those of the Mackerel (*Scomber scomber*).

I have also had an opportunity of examining some of the cast skin of the Salamander, which has been thrown off since the arrival of the reptile at the Gardens. The subjoined are drawings I have taken of this and of the cast skin of the *Triton cristatus*: fig. 1 represents the former and fig. 2 the latter, magnified 60 diameters.

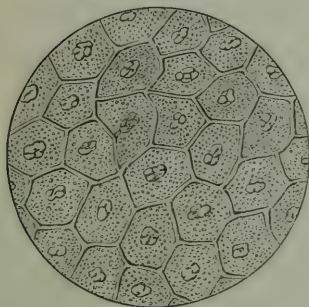


Fig. 1.

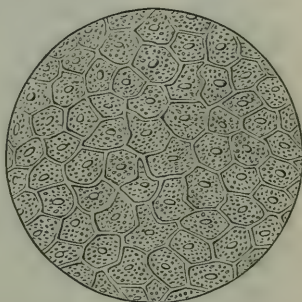


Fig. 2.

It will be seen that the epidermoid cells in both are hexagonal, and that those of the Salamander (fig. 1) are more than double the size of those of the Triton (fig. 2); the former measuring about  $\frac{1}{3\frac{1}{3}}$ th of an inch in diameter, the latter about  $\frac{1}{5\frac{1}{7}}$ th. It will be curious hereafter to observe the relative proportion of these cells to the blood-globules in other reptiles.

I purpose placing before the Society at an early period a comparative estimate of the size of the blood-corpuscles of this Gigantic Salamander, and those of the Siren, Lepidosiren, Proteus, and other reptiles.

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April 24th, 1860.

Dr. Gray, V.P., in the Chair.

Mr. Bartlett exhibited a series of the eggs of Struthious birds, including those of the Northern and Southern Ostrich, the American and Darwin's Rhea, the Common and Spotted Emeus (*Dromæus novæ hollandiæ* and *D. irroratus*), the Common Cassowary, and the Mooruk (*Casuarus bennettii*). The latter had been laid in the Society's Gardens on the 21st of April by the bird received from

Dr. Bennett in May 1858, which was thus proved to be a female. This egg (see Aves, Pl. CLXII.) was of a pale grass-green colour, closely freckled with paler colouring, and much smoother and more finely granulated than that of the Common Cassowary. It measured 6.0 by 3.45 inches, and weighed  $22\frac{1}{2}$  oz. Its shape was more elongated and pyriform than that of the Cassowary or Emeu.

Mr. Gould exhibited specimens of the Chough of the Himalayas, which he proposed to call *Fregilus himalayanus*, and pointed out the characters which distinguish it from the European bird (*F. graculus*).

Mr. F. H. Wilson exhibited four examples of a curiously-coloured variety of the Common Mole (*Talpa europæa*), and read the following note on them :—

“Nine of these Albinos were caught in the same meadow within a few days, on Mr. Gibbon’s farm, Beckenham, Kent. The Mole in general has four or five young ones at a birth. It is possible that all these were the offsprings of the same parent, but I should think they must have bred amongst themselves. They were caught February 20th, 1860.”

Mr. Sclater announced the arrival of some interesting animals from British Honduras, presented by R. Temple, Esq., Chief Justice of the Colony, to the Society’s Menagerie. These consisted of a pair of Guans (*Penelope purpurascens*), a pair of Curassows (*Crax globicera*), a Collared Peccary (*Dicotyles torquatus*), and specimens of a singular breed of the Domestic Fowl, remarkable for its bones being black.

Mr. Sclater observed that the following letter received from Mr. Temple seemed to indicate the presence in British Honduras of a second species of Peccary, called the ‘Warree,’ about which more information would be very desirable :—

“16 St. James’ Square,  
Notting Hill, April 20th, 1860.

“SIR,—The Warree, about which you wish me to give you some information, differs in some respects from the Peccary. The latter, as I said before, is never seen, except in couples,—the former invariably appears in large flocks. The head of the Peccary is very large and clumsy in proportion to the body. That of the Warree is less disproportionate. The coat or skin of the Peccary is covered with long hairs, which are darkish at the roots, and lighter coloured at the tips. The colour of the Warree is a dirty black, and the hair is long and tangled. The legs of the Peccary are shorter than those of the Warree. Both have the same orifice on the back, from which exudes a liquid having a very offensive odour. When either of these animals is shot for the purpose of being eaten (and they are excellent food), the orifice on the back must be instantly cut out, or the whole of the flesh will become so much tainted, that, so far from being able to eat it, you cannot tolerate its vicinity. But if the excisional knife has been applied in time, the flesh is sweet, white, short, and tender. The Warree is a far more ferocious animal than the Peccary; but

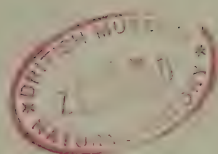




EGG OF CASPIAN PUFFIN.

PLATE I.

PLATE I.



his courage perhaps may arise from a principle not quite a stranger to the human breast—a consciousness of being well supported; for, as I have said, they are always seen in multitudes. If you meet a flock of Warrees in the bush, and you take no notice of them, it is probable that they will take no notice of you. But if your intentions are hostile, and your design is to transfer one of them from his native wilderness to your kitchen, you must take care to place yourself in a safe position before you carry your design into execution. A gentleman, not long since, shot a Warree without having taken the necessary precautions; the remainder of the flock instantly pursued him, and if he had not managed to climb into a tree, he would have been torn in pieces. But he was kept a prisoner in that leafy asylum for many hours, the surviving Warrees being bent on revenging the death of their companion. Even when the flock went a little distance to feed, they left two or three to stand guard at the foot of the tree. The hunter has no difficulty in tracing the Peccary and the Warree, by the strong odour which prevails wherever they have been.

“ I am, Sir,

“ Your obedient servant,

“ R. TEMPLE.”

The following papers were read :—

1. ON THE RHEAS IN THE SOCIETY'S MENAGERIE, WITH REMARKS ON THE KNOWN SPECIES OF STRUTHIOUS BIRDS. BY PHILIP LUTLEY SCLATER.

In November 1858 the late Mr. Thompson purchased for the Society in Liverpool a young *Rhea*, which now seems to have nearly attained its adult growth. It proves to be so remarkably different from the Common Rhea (*Rhea americana*) and the Darwin's Rhea (*Rhea darwini*), examples of which are kept in the same inclosure with it, that I have little hesitation in characterizing it as of a different species; and in so doing I believe I have the concurrence of Mr. Gould, Mr. Bartlett, and other naturalists, who have had an opportunity of examining the bird.

The Long-billed Rhea (*Rhea macrorhyncha*, as I propose to call it) is a much smaller bird than the Common Rhea. The example in the Gardens, a male, stands about 6 inches lower than the two females of the American Rhea, which are in its company, and we may reasonably suppose that the female is proportionately smaller. The bill is much longer than that of the Common Rhea, as may be seen from the drawings (woodcut, figs. 1, 2, 3), which represent the heads of the three species, and the head-feathers are longer and more closely flattened down. On the other hand, the tarsi are much more slender and the toes much shorter. The thighs are less thickly clothed than in the Common Rhea; but the scutellation of the tarsi seems to be nearly the same in both these birds, and offers a marked contrast to that of *Rhea darwini*, in which the tarsi are for the greater part covered with reticulated scales. The feathers of the body are longer in the Long-billed Rhea, and curve round it, hiding the outline, in a manner not observable in the Common Rhea. With regard to

colouring, the new species is also very different, being of a brownish-grey mixed with black, and altogether much darker than *Rhea ame-*



Fig. 1.



Fig. 2.

*ricana*. The top of the head and streak at the back of the neck in particular are of a deep black.

The accompanying drawings represent (fig. 1) the head of the new Rhea (*R. macrorhyncha*) and the heads of the two other species, *Rhea americana* (fig. 2) and *Rhea darwini* (fig. 3), which are given for the sake of comparison.

I am told that this Rhea is already known to some of the dealers in living animals as a distinct species; and I hope it will not be long before we obtain further particulars concerning it, and discover what part of South America it inhabits.



Fig. 3.

I take this opportunity of bringing before the Society a short *résumé* of the present state of our knowledge of the species of *Struthionidæ*, which appear to be more numerous than was formerly supposed.

#### I. STRUTHIO.

The Æthiopian type of the *Struthionidæ* (the most perfect of the kind, as is its type of the Anthropoid Apes) requires our first attention. I have long suspected that the Ostrich of Southern Africa, when closely compared with the bird of the Sahara, will turn out to be a different species, and I know that many other naturalists share my views. The eggs, as Mr. Bartlett has shown in exhibiting his fine series of the eggs of *Struthionidæ* this evening, seem to present well-marked differences. That attributed to the Southern bird is smaller and very much smoother and less deeply pitted, the granulations in some specimens being nearly evanescent. But I have reason to believe that the Southern bird is the larger in size. Through the unfortunate loss of both the young Ostriches presented to the Society by Sir George Grey last summer, we have missed the opportunity which we should otherwise have had of comparing them with the noble examples of the Northern bird which grace our Menagerie. But, as Sir George Grey, who is now returning to the Cape Colony, has promised to obtain for us other adult examples, there

is every reason to believe that we shall ere long be able to make the desired comparisons\*.

The Ostrich of the Syrian and Arabian Deserts, mentioned by Col. Chesney (Journ. Euphr. Exp. i. p. 588), Dr. Layard (Nineveh, i. p. 324), and other writers, and frequently referred to in the Holy Scriptures†, should also be carefully examined. It is not improbable that it may turn out to be a third species or well-marked local variety.

In the interior of Africa there is said by some of the older writers to exist a diminutive Ostrich (*L'Autruchon*). I have lately received some information on this subject from Mr. J. Petherick, H.B.M. Consul for Sudan, who tells me that his hunters have actually had this bird alive, and I have requested him to endeavour to procure further evidence on this point.

## II. RHEA.

I have already pointed out above the characters which distinguish *Rhea macrorhyncha*—the third species of the Neotropical type of the *Struthionidæ*—from the two previously known, *R. americana* and *R. darwini*. There are examples of all three living in the Society's Gardens.

## III. CASUARIUS.

The Indian Region, like the two Northern Geographical Regions—the Palæarctic and Nearctic ‡—has no Struthious birds—the genus *Casuarius* being confined to the northern portion of the Australasian Region, and represented in the main land of Australia by species of the nearly allied genus *Dromæus*. Of *Casuarius* we have indications of the existence of five species, as follows:—

1. *Casuarius galeatus*, the Common Cassowary. In the Leyden Museum are specimens of this bird from Ceram, the only certain locality I know for it. We have a very fine male example living in our Gardens.

2. *Casuarius bennettii* (P. Z. S. 1857, p. 268, pl. 129; 1858, p. 271; 1859, p. 32), the Mooruk of New Britain, of which we have three examples in our Gardens.

3. *Casuarius australis* (P. Z. S. 1857, p. 268), discovered by the late Mr. Wall on Cape York, Northern Australia, and said to be distinguished by a “bright red helmet and blue and scarlet caruncles.” The only example yet obtained of this bird has been unfortunately lost.

4. *Casuarius* —, a species living in the menagerie of the Babu

\* Prince Bonaparte speaks of a *Struthio epoasticus*, Compt. Rend. xliii. p. 785, but I cannot make out that he refers to either the southern or northern species.

† Isaiah, ch. xlii. v. 21: “*Habitabunt ibi Struthiones*,” translated in our version ‘doleful creatures!’ Also Lamentations, iv. 3; Job, xxxix. 13 *et seq.*, and other passages. The Ostrich was unclean according to the Jewish law.

‡ Confer Journ. Proc. Linn. Soc. ii. p. 130 (1858).

Rajendra Mullick of Calcutta, and mentioned by Mr. Blyth\* as having "a yellow throat, a single yellow throat-wattle, and a long stripe of naked yellow skin down each side of the neck." I have not yet received Mr. Blyth's published description of this bird.

5. *Casuaricus bicarunculatus*, a name I propose to apply to a Casowary of which I have recently obtained a young example for the Society in exchange from the Zoological Gardens at Rotterdam. It is easily distinguishable by the throat-caruncles being placed far apart on the sides of the throat, lighter colouring, &c. As the bird itself will shortly arrive in this country, I hope to be able to give full particulars concerning this new species at the next Meeting of the Society.

#### IV. DROMÆUS.

At a Meeting of this Society in May last †, Mr. Bartlett gave us some indications of the existence of a second species of Emeu in South Australia, and proposed to call it *Dromæus irroratus*. I have lately had the pleasure of examining two specimens of this Emeu in Holland. One of these, now in the Gardens of the Zoological Society of Amsterdam, was brought from Albany in Western Australia, and thus renders it probable that the Spotted Emeu is the western representative of the *D. novæ hollandiæ*. The second, now in the Zoological Gardens at Rotterdam, I have obtained by exchange for this Society; and, as we may hope to see it in our own Gardens in a few days alongside the Eastern species, I reserve further notice of it until I have had a more satisfactory opportunity for its examination.

It thus appears that there are some grounds for supposing that the species of *Struthionidæ* now in existence may amount to not less than fourteen or fifteen in number.

#### 2. NOTES ON A SECOND COLLECTION OF MAMMALIA MADE BY MR. FRASER IN THE REPUBLIC OF ECUADOR. BY ROBERT F. TOMES.

Since my previous notes on the Mammals collected by Mr. Fraser at Gualaquiza (P. Z. S. 1858, p. 546), a considerable number of specimens have been received from him, many of them of great interest. The following is a list of the species transmitted. The greater portion of these are believed to have been collected at Pallatanga, on the western slope of the Cordillera; but the exact locality is not certain, from the specimens having been unfortunately mixed together.

##### 1. VESPERTILIO NIGRICANS, Pr. Max.

*V. chiloënsis*, Waterh.

The collection contains four specimens of this species. In my

\* *Ibis*, 1860, p. 193.

† See P. Z. S. 1859, p. 205.

former list I included *V. chiloënsis*, but find on closer examination that the specimens there mentioned should have been referred to an allied, but smaller species, the *Vesp. isidori*, which is probably identical with the *V. albescens* of M. Geoffroy. The Bat which I now instance is certainly identical with the *V. chiloënsis* of Mr. Waterhouse, as I have in my collection numerous specimens from various parts of South America, and from Mexico, with which it perfectly agrees, and which have been carefully compared with the type specimen of *V. chiloënsis* and found to be similar.

## 2. ARCTIBEUS LILIUM, Geoff. sp.

*Phyllostoma lilium*, Geoff.

*Sturnira spectrum*, Gray.

Six specimens have been sent home by Mr. Fraser. It is a very common species, and appears throughout the greater part of South America, and as far north as Mexico; but I have not seen specimens from Jamaica or other West Indian Islands, although the larger species of *Arctibeus*, common in South America, are also common there.

## 3. DESMODUS RUFUS, Pr. Max.

As many as five specimens are contained in the collection, and this, as well as the tolerable plenty in which it appears in other collections from South America, would seem to show that it is by no means a rare animal. I have also seen specimens collected in Mexico by M. Sallé, which were in all respects similar to those from South America.

## 4. DIPHYLLA ECAUDATA, Spix.

In the 'Voyage dans l'Amérique Méridionale' of M. D'Orbigny, plate 9, two outline figures are given of the dentition of this animal, from which, if we may believe in their authenticity, the *Diphylla* must be closely affined to the frugivorous *Phyllostomidæ*. It is much more probable, however, that these figures escaped that correction of the plates which they had to undergo after being executed, by the letter-press of the work, as the species is nowhere mentioned in the latter. The figures in question appear to me to refer to the cranium of the *Phyllostoma (Arctibeus) lilium*. Excepting these figures, I have nowhere met with any original allusion to the *Diphylla* since the account given by the original describer, and it is probable that no other specimens have been met with, until the appearance of the present one from Mr. Fraser. The improbability of any near alliance with the frugivorous *Phyllostomidæ* will be best explained by the following note appended to this specimen by Mr. Fraser:—

"Rio Napo. *Murcielago*. This specimen was taken by the son of Professor Jamieson in the act of drawing blood from a man."

*Murcielago* is the Spanish name for this Bat. In general form, in the shape of the head and face, and in the strength of the claws, it bears considerable resemblance to the *Desmodus*, and I venture to



predict that when its dentition has been examined it will be found to differ in no important respects from the dentition of that genus.

5. *MOLOSSUS OBSCURUS*, Geoff. (*M. fumarius*, Spix?)

This Bat is common over the greater part of South America, and one differing only in being a little smaller occurs in the West Indian Islands. Mr. Gosse mentions it as *M. fumarius*. Specimens from St. Croix precisely resemble the Jamaican ones.

6. — — ?

A small animal about the size of the Water Shrew (*Sorex fodiens*), with external characters and incisor teeth so much like those of the *Soricidæ* as to have led in the first instance to the belief that it was a placental *Insectivore*, perhaps in some degree resembling the *Solenodon* of Cuba. However, the existence of a small and rudimentary pouch sufficiently attests the implacental nature of the creature, which but for this must certainly, as far as external appearances go, be regarded as one of the *Soricidæ*. A more ample account of it will be given on a future occasion.

7. *SCIURUS ÆSTUANS*.

The specimens contained in the present collection differ from those in the former one in having all the under-parts, which in them were but of a pale rust-colour, of a deep bright ferruginous hue. The males and females are similar. They are all from Pallatanga; and the native name, Mr. Fraser tells us, is "*Ardillo*."

8. *HESPEROMYS RENGGERI*, Waterh.

Of this species the collection contains a good number of specimens which differ in no important respect from those obtained by Mr. Bridges in Bolivia.

9. *H. ELEGANS*, Waterh.

Only two specimens appear, and one of these differs very considerably from the other in having longer and more pointed ears, and in being itself somewhat larger; but these differences I do not consider sufficient to constitute a specific distinction. The crania of these examples are similar, excepting a little difference in size, and are both remarkable for the great length of the incisive foramina.

10. *H. LATIMANUS*, n. s.

The present species, of which the collection contains but a single specimen, a male, accords with moderate accuracy with the dimensions given of the *Mus pyrrhorinus* of Prince Maximilian, but differs so remarkably from this and all other species with which I am acquainted, or can meet with descriptions of, in several important particulars, that I regard it as new, and propose to describe it under the above name.

The face is short, and the muzzle rather tumid; the muffle very

small, and with two pointed, downward processes beneath the nostrils. Fore feet short and broad, their palms with the two hinder tubercles rather large, sparingly covered on their upper surface with short hairs. Claws small and pale in colour. Hind feet rather short and very broad, with the under surface perfectly destitute of hairs for the whole of its breadth, with the exception of the calcaneum, which is well covered. Their upper surfaces clothed with short hairs, which are white on the toes, but nearly black on the middle of the foot; claws short, but rather strong. Tail long, not very thick at the root, and tapering insensibly to a thickish point. It is finely annulated with scales, and slightly suffused with short hairs, much as in the common Rat, *Mus decumanus*, but at the tip there is a small but very distinct tuft of hairs.

The fur is everywhere very thick and soft; that of the whole of the upper parts is dark dusky at the roots, tipped with brown and intermixed with darker hairs, towards the sides of the body tinged with rufous. Beneath, pure white; on the abdomen and pubal region only the hairs are ash-coloured at their roots. The colours of the upper and under parts are divided by a well-defined line along the side of the body. A conspicuous spot of pure white marks the root of the whiskers, which are numerous, strong, and black.

The specimen is a male, and the following are the dimensions:—

	in.	lin.
Length of the head and body . . . . .	4	7
— of the tail . . . . .	6	2
— of the head . . . . .	1	6
— of the ear . . . . .	0	6
— from the end of the nose to the front of the eye . . . . .	0	6½
— from the end of the nose to the front of the ear . . . . .	1	1
— of the fore foot . . . . .	0	6½
— of the hind foot . . . . .	1	1
Breadth of the fore feet, nearly . . . . .	0	3
— of the hind feet, nearly . . . . .	0	3½

The cranium has its nasal part short, scarcely longer than in *H. longicaudatus*, which is a smaller species. The zygomas spring out at once to nearly their full degree of prominence, and extend backwards in the same way as in other species of the genus; but the frontal region is rather more expanded than is usual, so that the space between the orbits is rather broad, and this gives the zygomas the appearance of extending further backward than they really do. The incisive foramina are very long, occupying nearly the whole of the space between the molar and incisor teeth.

	in.	lin.
Length from the anterior extremity of nasal bones to occipital crest . . . . .	1	3
Breadth across the zygomatic arches . . . . .	0	8
— between the orbits . . . . .	0	2½

	in.	lin.
Length of the nasal bones . . . . .	0	5
——— of the molar range . . . . .	0	2½
——— from anterior edge of first molar to point of incisor . . . . .	0	4
——— of lower jaw, from point of incisor to ex- tremity of condyle . . . . .	0	9
——— of molar range . . . . .	0	2½
Height from angular process to top of coronoid process . . . . .	0	4

*Obs.* This species may readily be distinguished by its short head, broad feet, long and but slightly tapering tail with its terminal tuft of hairs, and by the clear line of demarcation of the colours of the upper and under parts. These peculiarities tend to give it less of a rat-like appearance than its congeners, and induced me at first sight to regard it as referable to some other genus,—an illusion that was dispelled by an examination of the cranium.

#### 11. *H. MINUTUS*, n. s.

It is with some hesitation that I proceed to name and describe this species, not from any doubt as to its being perfectly distinct, but on account of the only specimen received being a young animal, so that the description might not apply with exactness to one perfectly adult. However, it is probable that it has attained nearly, if not quite, its full size, as the teeth, although unworn, exhibit a proportionate degree of prominence compared with those of other species; and its cranium, although rounded posteriorly as in young *Muridee*, is yet firmly united at its sutures. I find that very nearly full-grown individuals of *H. longicaudatus* have more distinct indications of immaturity than the specimen in question.

It is a rather remarkable species, scarcely larger than the smallest of our British quadrupeds (the Harvest Mouse), but with a tail nearly twice the length of its own body, and very long and soft fur, in colour like that of the Water Vole, both above and below.

The ears are short, but rather broad, almost black, and a little hairy near their margins. The whiskers are long, fully as long as those of *H. rengereri*, and the upper surfaces of the fore feet are clothed with short white hairs; the nails rather small, and white. The hind-feet, including the tarsus, are very long, much longer relatively than the same parts in *H. longicaudatus*, or indeed than in any other species with which it has been compared. They are sparingly covered with short hairs of a silvery-white colour, tinged with dusky on the middle of the foot, but near the claws very white. The tail tapers evenly to a very fine point, and is finely annulated with small scales, and suffused with fine short hairs, much as in the Common Mouse, *Mus musculus*. It is of a dark grey-brown colour, a little paler beneath.

On all parts the fur is very long, fine, and glossy, as long as or even longer than that of *H. longicaudatus* or *H. rengereri*, and it almost conceals the ears, giving the creature the appearance of an *Arvicola*.

In its general colour it greatly resembles some of the more rufous examples of *Arvicola amphibia*, the fur being deep dusky at the root, tipped with rufous-brown, and with a slight mixture of black hairs. The under parts resemble the upper, except in being a little paler.

	in.	lin.
Length of the head and body .....	2	0
—— of the tail .....	3	0
—— of the head .....	0	9
—— of the ears .....	0	3½
—— from the end of the nose to the anterior margin of the eye .....	0	4
—— from the end of the nose to the front margin of the ear .....	0	7
—— of the fore foot .....	0	4½
—— of the hind foot .....	0	9½
—— from the anterior extremity of the nasal bones to the occiput .....	0	10
Breadth across the zygomatic arches .....	0	5
Length of lower jaw, from point of incisor to the condyloid process .....	0	5¾
Depth from the point of the coronoid process to the posterior or angular process .....	0	2¼

12. *DASYPROCTA FULIGINOSA*, Wagler, Isis, 1832.

*D. nigricans*, Natt. Wagn. Archiv. Naturgesch. 1842.

*D. nigra*, Gray, Ann. & Mag. N. H. 1842.

Of a specimen apparently referable to this species, but a little smaller than the one which furnished the dimensions given by Dr. Wagner, Mr. Fraser speaks thus:—"From Pallatanga; ♀ by dissection; native name *Guatusa*."

13. *DASYPROCTA CAUDATA*, Lund. Kongl. Danske Videnscab. &c., 1841; Waterh. Mam. ii. p. 387.

In the various works on Mammals of South America to which I have access, I do not find this species mentioned, and neither is it included in the general work on Mammalia by Dr. Wagner, so that I conclude that it must be rare. Mr. Waterhouse refers to the original description, and to two specimens in the Leyden Museum, a description of which he gives; and as in this, as well as in other cases when provided with sufficient materials, he leaves little to be desired, I refrain from further description, except to add, that the species may be at once recognized by its colour, which bears some resemblance to that of the common Badger. The following note accompanying the specimen is of interest:—"From Pallatanga, ♀ by dissection. Native name *Guatusa*. Irides greyish brown. Shot near the house in the day-time: two young in the abdomen, one a male and the other a female, quite naked, about 3 inches in length."

14. *DIDELPHYS WATERHOUSII*, Tomes, P. Z. S. 1860, p. 58.

Another specimen of this species has appeared, like the other one, a female, and resembling it also in all particulars except in having the general hue of the fur more decidedly ferruginous, especially on the side of the body and of the neck, and in having the short hairs on the region of the pouch and pubes of a brownish-yellow colour. The tail is uniform dark brown, without a trace of white or flesh-colour. As this specimen is preserved entire in spirit, I am enabled to give a very complete table of dimensions.

	in.	lin.
Length of the head and body .....	5	7
——— of the tail .....	6	9
——— of the head .....	1	6
——— from end of nose to front margin of eye .....	0	7 $\frac{1}{4}$
——— from end of nose to front margin of ear .....	1	3
——— of the gape-line .....	0	7
——— of the ears .....	0	7
——— of the fore arm .....	0	11 $\frac{1}{2}$
——— of the fore foot and claws .....	0	7
——— of the free portion of the thumb ..	0	3 $\frac{1}{4}$
——— of the tibia .....	1	3
——— of the tarsus and toes .....	0	10 $\frac{1}{2}$
——— of the fore portion of the opposite toe of the hind foot .....	0	2 $\frac{1}{2}$
——— of the hairy portion at the root of the tail .....	0	7

*Obs.* This species appears to resemble somewhat the *D. noctivagans* of Tschudi, but is obviously smaller, and has more black around the eye.

15. *DIDELPHYS* — ?

Very young. Perhaps the young of the last species.

I take this opportunity of correcting an error in my former report, and of adding the description of a species which I noticed, but did not describe.

The species of *Hesperomys* which I referred to *H. longicaudatus* having been removed from spirit, the fur appeared when dried to be so unlike that of the species just mentioned, as to stimulate a closer examination, when other differences were found, quite sufficient to justify the application of the following name and description.

*HESPEROMYS BICOLOR*, n. s.

*H. longicaudatus*, Tomes, "Notes on a Collection of Mammalia from Gualaquiza," P. Z. S. 1858, p. 546.

General appearance somewhat like that of *H. longicaudatus*, but rather larger; ears not so broad relatively as in that species, and the fur much shorter, paler in colour, and more cottony in texture. Tail relatively not so long.

The muzzle is rather short and obtuse, and the muffle, as in so many other species of *Hesperomys*, has two little projections under the nostrils, which point downwards. The ears are of the same length as those of *H. longicaudatus*, but they are much narrower than those of that species; they are naked, with the exception of a portion of their hinder surface at the root. The fore feet are rather broad, and have their upper surface suffused with short, fine, pale brown hairs, much as in *H. darwini*; the toes themselves are nearly naked towards the claws, and are destitute of long hairs around the latter; the claws are short, and of a lightish brown colour. In *H. longicaudatus* they are white. Hind feet rather short and broad, and well clothed with very fine short hairs of a cinnamon-brown colour, which are whiter on the toes; claws light brown. Tail annulated with exceedingly small scales, much smaller than those of the tail of any other species examined, and sparingly suffused with extremely fine and short hairs, forming at the end a pencil of exceeding softness. It is everywhere of a uniform dark brown colour.

The fur of the body is on all parts short and thick, soft to the touch, and perfectly devoid of lustre, and it has but a very trifling number of the usual longer and darker hairs. On the head and face it is no longer than that of the common Shrew (*Sorex vulgaris*, Linn.), and it is nearly as fine as in that animal. All the upper parts are darkish cinnamon-brown (the fur being ash-coloured at the root), and the brown colour extends along the exposed or outer surface of the limb. The fur of the whole of the under surface, from the chin to the vent, and the inside of the limbs, uniform yellowish white from root to tip. The line of division of the brown and white is moderately distinct, very much as in adult specimens of *Mus sylvaticus*, to which animal it bears in general appearance some resemblance. A pure white spot marks the root of the whiskers, which are few in number, very long, and black.

	in.	lin.
Length of the head and body, about . . . . .	3	9
——— of the tail, about . . . . .	3	6
——— of the head . . . . .	1	3
——— of the ears . . . . .	0	4 $\frac{1}{4}$
Breadth of the ears . . . . .	0	3 $\frac{1}{2}$
Length from the end of the nose to the eye . . .	0	6
——— from the end of the nose to the ear . . .	0	10
——— of the fore foot and claws . . . . .	0	6
——— of the hind foot and claws . . . . .	0	9 $\frac{1}{2}$

*Cranium.*—The skull of this species is a miniature of that of *H. latimanus*, and bears but little resemblance to that of *H. longicaudatus*. It is chiefly remarkable for the breadth of the frontal bones, by which the space between the orbits is rendered much wider, and

its narrowest part reduced to a mere point in an antero-posterior direction ; whereas in all the other species examined, with the exception of *H. latimanus*, the greater part of the space which lies between the orbits is of equal breadth. In *H. elegans* this is remarkably the case.

The lower jaws of this species and its fellow, *H. latimanus*, exhibit a difference also from most other species in the comparative shortness of the *posterior angle* or *descending ramus*, so that the hinder margin of the jaw, from the condyle to the *angle*, forms but a very slight curve. In most species, and especially in *H. elegans*, this part of the jaw is deeply emarginate.

	in.	lin.
Length from the extremity of the nasal bone to the prominence above the foramen magnum ..	1	1
Breadth across the zygomatic arch .....	0	7
—— between the orbits .....	0	2½
Length of the nasal bones .....	0	4
—— of the molar range (upper jaw) .....	0	2
—— from anterior edge of front molar to the point of the incisor .....	0	3¾
—— of the lower jaw, from the point of the incisor to the condyle .....	0	8
—— of molar range (lower jaw).....	0	2
Height from the angular process to the summit of the coronoid process .....	0	3½

#### H. AUREUS, n. s.

The colour of this species is sufficient to distinguish it from all others. It is of a golden-brown colour on all the upper parts, and similar beneath, but paler and much duller.

The muffle has two very distinct points beneath the nostrils ; the ears are of medium size, as broad as long, and somewhat hairy on both their surfaces ; the whiskers are numerous, long and black. The arms are well clothed with fur like that of the body, quite to the wrists, and the feet have all their upper surface well covered by short and shining hairs of a brownish yellow colour. The hinder feet are similarly clothed with shining hairs, those which are above and around the claws long and yellow ; on the calcaneum is a distinct tuft of curved bristly hairs. The tail is finely annulated, and suffused with exceedingly short hairs, which do not conceal the scales, and is of a uniform darkish brown colour.

The fur is long and thick, but not very fine. Everywhere it is dark dusky at the root, with its terminal fourth bright yellow brown. On all the under parts similar, but paler and less bright ; and along the dorsal line there is a sufficient mixture of longish black hairs to conceal the bright colour of the fur. On the hind part of the back, the rump, and back of the thighs, it is bright enough to be properly styled a golden brown, somewhat like the colouring of the most vivid examples of the *Agouti* (*Dasiprocta*).

	in.	lin.
Length of the head and body, about . . . . .	6	6
— of the tail . . . . .	9	0
— of the head . . . . .	1	9
— of the ears . . . . .	0	8
— of the fore foot and claws . . . . .	0	9
— of the fore arm . . . . .	1	1
— of the tibia . . . . .	1	6
— of the hind foot and claws . . . . .	1	4

*Obs.*—The species which are here described under the names of *H. latimanus* and *H. bicolor* do not fall with facility under either of the subgenera proposed by Mr. Waterhouse; and neither do they agree with the species which are brought by Wagner and Burmeister under the generic or sub-generic name of *Holochilus*. They constitute rather a group of themselves, which I will here briefly characterize.

But I may premise, before doing this, that it seems to me needless to encumber science with another name; for I am scarcely of opinion that this or any other of the groups into which the genus *Hesperomys* has been divided, should be regarded as more than divisions for the convenience of description and identification. A group which is characterized in as purely superficial a manner as are those now under review, should, to hold a recognizable place in any system, have a well-defined outline: although removed to but a little distance from allied groups, the intervening space should be quite clear of outliers from either side. There are perhaps but few such groups to be met with, but there are some. It is probable that such occur in the *Soricidæ*, and amongst the Bats I can cite two good instances. The genus *Nycticejus* of Asia and Africa differs from the heavy-built *Vespertiliones* (*Scotophilus*) in a trifling but constant manner, the characteristic differences appearing to be but feeble in a generic signification; but immensely strengthened by their constancy. The genus contains several well-marked species, all of which possess the same characteristics in a nearly equal degree. Another and equally good instance is the genus *Lasiurus*, confined to the New World.

I have in vain sought for anything like this amongst the subgenera into which *Hesperomys* has been divided; I even find sufficient variation in different individuals of some of the species to endanger these divisions. For instance, the difference in the length of the tail in *adult* specimens of *H. longicaudatus* is very considerable, and the ears in *H. elegans* vary in size in a remarkable manner, so much so, as to give the idea of two distinct species. But the peculiarity is wholly superficial, and is *highly variable*. By these variations the subgenera *Calomys* and *Phyllotis* are, as it were, mixed up and blended, and their value impaired. The genus itself—*Hesperomys*—may more properly be likened to the genera of *Vespertilionidæ* of which I have spoken, as it is distinct from the cosmopolitan genus *Mus* in one only, but very constant point of dissimilarity—the presence of a rather greater number of folds of enamel in the crowns of the molar teeth. We do not know the exact degree of importance



to attach to this character, existing as it does unsupported by other associative characters. With the very close resemblance which in other respects obtains between these Old and New World *Muridæ*, ought we to consider this one point as indicative of more than sub-generic difference?

The following are the groups into which the genus has been divided by Mr. Waterhouse, with the addition of one for the reception of the two species here described—*H. latimanus* and *H. bicolor*.

A. *Scapetromys*, Waterh. Ex. *Hesperomys tumidus*, Waterh.

B. *Oxymycterus*, Waterh. Ex. *H. nasutus*, Waterh.

C. *Abrothrix*, Waterh. Ex. *H. longipilus*, Waterh.

D. *Calomys*, Waterh. Ex. *H. bimaculatus* & *H. elegans*, Waterh.

E. *Phyllotis*, Waterh. Ex. *H. darwini*, Waterh.

F. Characterized thus:—Muzzle short and tumid; ears small and naked, but not concealed by the fur; feet short, broad and strong; claws short; tail as long as or longer than the body, nearly naked, but with more or less of a pencil of hairs at the tip, rather thin at the root, and tapering but slightly to a blunt point; fur short, thick, soft, and without gloss.

= *Rhipidomys*, *Tschudi*

### 3. ON THE BLACK-SHOULDERED PEACOCK OF LATHAM (*PAVO NIGRIPENNIS*). BY P. L. SCLATER.

The species of the genus *Pavo* generally recognized by naturalists since the time of Linnæus have been two in number—the Common Peacock (*Pavo cristatus*) and the Javanese or Green Peacock (*Pavo muticus*). My present object is to call the attention of the Society to what seems to be a *third* distinct species, in some respects intermediate between these two, and which, though long since introduced into Europe and often bred in our aviaries, appears in some mysterious manner to have almost escaped the notice of naturalists, and to have been left unprovided with a specific name up to this time.

The bird I allude to is the Black-shouldered Peacock of Latham's 'General History' (vol. viii. p. 114), where its differences from the true *Pavo cristatus* are accurately pointed out. They are, indeed, very obvious on comparison of either sex of these two birds, as may be seen by any one who will take the trouble to inspect the fine series of Pea-fowl belonging to C. Clifton, Esq., now under the Society's care in the Regent's Park Gardens.

In the Black-shouldered Peacock of Latham (a term which I propose to Latinize into *Pavo nigripennis*), the metallic green of the back, which forms the centre of the train, when expanded, is of a more golden hue than in *P. cristatus*, which it otherwise most generally resembles. The whole of the secondaries, scapulars, and wing-coverts are black with outer narrow edgings of green, which becomes bluish towards the carpal joint. In this particular it re-

sembles *P. muticus*, and is very different from *P. cristatus*, in which all these feathers are cream-coloured crossed with black markings. The thighs of *P. nigripennis* are black, as in *P. muticus*. In *P. cristatus* they are always of a pale drab. The female of *P. nigripennis* is of a much lighter colouring than that of *P. cristatus*, being almost entirely of a pale cream-colour, mottled with dark colouring above, and readily recognizable at first sight. In this respect, it may be remarked that the Black-shouldered Peacock is not intermediate between the two others; since in *Pavo muticus* the female is much more like the male.

Now the question arises, What is the Black-shouldered Peacock? Is it a domestic variety, a hybrid, or a feral species? I cannot consider it a domestic variety, because the differences in both sexes appear to be constant, and to descend to the progeny; and, indeed, are not of that sort that would be induced by domestication. M. Temminck, in his 'Histoire Naturelle des Pigeons et des Gallinacés,\*' considers the Black-shouldered Peacock as the true Wild Peacock, and the *Pavo cristatus* to be a domestic variety of *that*. But this we know is not the case; the Common Wild Pea-fowl of Hindostan being the true *Pavo cristatus*, and the Black-shouldered Peacock being, as I believe, *unknown* in that country†. That the *Pavo nigripennis* is not a hybrid between *P. cristatus* and *Pavo muticus*, is evident from the fact that we have now in our Gardens birds produced by this cross, and that they bear different characters altogether, as may be seen by the stuffed specimen which I now exhibit. Besides, the fertility of the birds, and the permanency and invariability of the differences which separate it from its two allies, seem to be quite conclusive against this view. If, therefore, it is not a domestic breed nor a hybrid, we must adopt the third alternative, and consider *Pavo nigripennis* as a distinct feral species. And I have little doubt that when the range of the *Pavonidæ* is more accurately known, we shall find that *Pavo nigripennis* occupies a distinct geographical area, which will in all probability be intermediate in position, as the bird is in characters, between *Pavo cristatus* and *Pavo muticus*.

Attention having been now called to this subject, I hope that no opportunity will be lost of examining the eggs, the osteology, and the anatomy of these birds, in order to ascertain whether the external characters are supported by other grounds of differentiation.

\* Vol. ii. p. 26, Paon Sauvage: *Pavo cristatus primus*.

† Our Head Keeper, Mr. James Thompson, who was in Calcutta in 1857, informs me that the Babu Rajendra Mullick, who is the owner of a very fine collection of living animals, had never seen the Black-shouldered Peacock, though he had specimens both of the Common and Javanese species in his Aviaries, and had bred hybrids between these two.

4. ON THE SPECIES OF THE GENUS PRIONITURUS, AND ON THE GEOGRAPHICAL DISTRIBUTION OF THE PSITTACIDÆ IN THE EASTERN ARCHIPELAGO. BY PHILIP LUTLEY SCLATER, M.A., SECRETARY TO THE SOCIETY.

Having lately examined specimens of all the known species of the group of Parrots denominated *Prioniturus* by Wagler, I take the opportunity of endeavouring to rectify some errors which have been made with regard to their synonymy and geographical distribution.

Genus PRIONITURUS, Wagler.

a. *Prioniturus*.

1. PRIONITURUS FLAVICANS.

*Psittacus platurus*, Vieill. Nouv. Dict. xxv. p. 314, et Enc. Méth. p. 1367 (?).

*Prioniturus flavicans*, Cassin, Proc. Ac. Phil. vi. p. 373; Journ. Ac. Phil. iii. p. 155 (♀).

“*Psittacus discosurus*, Vieill.”, Temm. in Mus. Lugd.

Diagn.—♂. *Viridis, collo undique cum pectore toto flavicantibus: macula verticali ruberrima undique cæruleo circumdata: alis extus viridibus fere concoloribus: rectricibus intermediis valde elongatis, denudatis, disco terminatis.*

♀. *Pileo cyanescente: macula verticali nulla: collo undique cum pectore flavicantibus: rectricibus intermediis paulo elongatis, apicibus angustatis, et subdisciformibus.*

*Hab.* In ins. Celebes, regione Boreali circa lacum Tondano (*Forsten et Wallace*).

*Mus.* Lugdunensi (♂ et ♀).

Examples of both sexes of this Parrot are in the Leyden Museum, obtained by Forsten at Tondano in Northern Celebes, and marked ‘*Psittacus discosurus*, Vieill.’ The bird is not *Psittacus discurus* of Vieillot, but possibly, I think I may say probably, his *Psittacus platurus*. However, as this is by no means certain from Vieillot’s insufficient description, and as the next species is generally considered to be the *P. platurus*, it is better to adopt for the present species the name *flavicans*, under which Mr. Cassin has accurately described the female. Mr. Wallace has lately met with this bird in the same locality as that in which Forsten found it. As he truly says\*, it is “very distinct in both sexes” from the *P. setarius*.

2. PRIONITURUS SETARIUS.

*Psittacus setarius*, Temm. Pl. Col. 15.

*Prioniturus platurus*, Wagl. Mon. Psitt. p. 523 (nec Vieill.); Bp. Consp. Av. p. 6.

*Psittacus spatuliger*, mas, Bourj. Perr. t. 53.

*Racket-tailed Parrot*, Lath. Gen. Hist. ii. p. 167. pl. 24.

*Prioniturus platurus* et *P. wallacii*, G. R. Gray, List of Psitt. p. 17.

\* See ‘Ibis,’ 1860, p. 141.

Diagn.—♂. *Viridis; torque angusto cervicali postico aurantiaco: macula verticali antice roseo-rubra, postice plaga cinerea terminata: alis fascia lata grisea, secundarias occupante, bipartitis, axillis cyanescentibus: rectricibus intermediis valde elongatis, denudatis, disco terminatis.*

♀. *Macula verticali nulla: rectricibus intermediis brevioribus.*

*Hab.* In ins. Celebes, reg. Boreali et Merid. (Wallace).

*Mus.* Brit. (♂ et ♀); Lugd. (♂).

Mr. Wallace obtained specimens of both sexes of this Parrot near Macassar in Southern Celebes, and has also lately met with it again in Northern Celebes, near the Lake of Tondano, though more sparingly than *P. flavicans*. I have examined Temminck's type in the Leyden Museum, and I can see no difference between that and Mr. Wallace's birds.

This species may be distinguished from the former at the first glance (1) by its narrow and distinct hind neck-collar, that in *P. flavicans* being broad and extending all round the neck and over the body below; (2) by its rosy head-spot, bordered behind by a broad greyish blotch, the head-spot in *P. flavicans* being rosy, and situated in the middle of a bluish blotch; (3) by the blue shoulders and pale greyish band formed by the secondaries, the wings in *P. flavicans* being uniform green; (4) by the elongated under tail-coverts, those of *P. flavicans* being comparatively short.

### β. *Urodiscus*.

#### 3. PRIONITURUS DISCURUS.

*Psittacus discurus*, Vieill. Gal. des Ois. i. p. 7. pl. 36; Enc. Méth. p. 1369; Wagl. Mon. Psitt. p. 524.

*Psittacus spatuliger*, fœm., Bourj. St.-Hil. Perr. t. 53 a.

*Prioniturus discurus*, Bp. Consp. Av. p. 6,

*Hab.* In ins. Mindanao Philippinensium (Vieill.).

*Mus.* Parisiensi.

The British Museum contains specimens of two nearly allied, but probably distinct species of this section of the genus *Prioniturus*, both from the Philippines. They are distinguished in Mr. Gray's Catalogue as *P. discurus* and *P. spatuliger*. But as the latter specific appellation was used by Bourjot St.-Hilaire for a compound species formed by the union of *P. setarius* and *P. discurus*, it is a useless synonym. It follows, therefore, that whichever of the two Philippine species is different from that in the Paris Museum, which is the type of Vieillot's and B. St.-Hilaire's figures, will require a new name.

I take this opportunity also of exhibiting a Table illustrative of the present condition of our knowledge of the distribution of the *Psittacidae* in the Eastern Archipelago, which I have drawn up at the request of Mr. A. R. Wallace. In the Indian Region, which includes the great islands of Sumatra, Java, and Borneo, and extends over the Philippines, the generic types of this family are few. *Palæornis* and *Loriculus* are the most prominent. *Psittinus* consists of a single species found in Malacca, Sumatra, and Borneo: and *Cyclopsitta*,

with one or perhaps two species, is peculiar to the Philippines, where also *Urodiscus* (a subgenus scarcely separable from *Prioniturus*) occurs\*. But on crossing the Straits of Macassar and Lombok, which, as Mr. Wallace has well shown (Proc. Linn. Soc. iv. p. 172), form the boundary between the Indian and Australian regions, we meet at once with a strange contrast. In the islands scattered between this limit and the northern coast of Australia, not less than seventeen different genera of *Psittacidae* occur; and among them are two very peculiar types, the *Cacatuinae* and *Trichoglossinae*, which, as Mr. Wallace has observed, "extend up to the extreme limits of the region without a solitary species passing over into the Indian islands of the Archipelago."

The distribution of the *Psittacidae* in this region is further of great interest as exhibiting numerous instances of that well-known principle of geographical distribution according to which different horizontal areas are tenanted by closely allied and corresponding, though different species of the same generic type. The *Psittacidae*, both in the Old and New World, appear to be especially subject to the influence of this law †. Scarcely an instance is known of a bird of this family having an extended geographical range, and experience teaches us to be very suspicious of any supposed instance of the occurrence of the same species of Parrot in two localities of any distance apart. Mr. Wallace tells us that even between the *Lorius garrulus* of Gilolo and that of Batchian "there is a constant difference in the size of the dorsal yellow patch ‡."

The accurate working-out of the range and localities of the whole family would form a valuable contribution to our knowledge of zoological geography. There are, however, many species of the true *habitats* of which we are still ignorant. It is with the hope of being of some use to Mr. Wallace in his endeavours to increase our knowledge of this subject, that I have drawn up the Table I now exhibit. It is an extension of a somewhat similar one given in the zoological volume of the 'Verhandeligen.' Many additional localities have been ascertained by examination of the marked specimens in the Collection of Leyden, to which, through the courtesy of Professor Schlegel, I have always had unrestricted access during my visits to that city.

In the following lists of the species inhabiting the different islands, I have given the Museums where the specimens are to be found, and the names of the collectors, when ascertainable:—

\* With the exception of *Loriculus*, of which one species (*L. stigmatus*) has straggled over into Celebes, all these types are confined to the Indian as distinct from the Australian region. In the same way a single species of *Cacatua*—a characteristic group of the Australian region—(*C. philippinarum*), is found in the Philippines, and a *Tanygnathus*, or probably two of this group (*T. lucionensis* and *T. sumatranus*), the third species being peculiar to Celebes and Bouton.

† I have made some remarks on the exemplification of this law in the distribution of the *Psittacidae* in the various West India Islands, in the 'Annals and Magazine of Natural History' (1859), vol. iv. p. 224.

‡ 'Ibis,' 1860, p. 198.

## I. LOMBOCK.

1. *Cacatua æquatorialis*. Mus. Brit. Wallace.

## II. SUMBAWA.

1. *Trichoglossus forsteni*. Mus. Lugd. Forsten.

## III. CELEBES.

1. *Prioniturus setarius*. Mus. Brit. Wallace.
2. *P. flavicans*. Mus. Lugd. Forsten.
3. *Tanygnathus mülleri*. Mus. Brit. Wallace.
4. *Loriculus stigmatus*. Mus. Lugd. Forsten.
5. *Trichoglossus ornatus*. Mus. Lugd. Forsten.

## IV. BOUTON.

1. *Tanygnathus mülleri*. Mus. Lugd. Müller.
2. *Trichoglossus ornatus*. Mus. Lugd. Müller.

## V. TIMOR.

1. *Geoffroius jukesii*. Mus. Brit. Jukes.
2. *Aprosmictus vulneratus*. Mus. Lugd.
3. *Trichoglossus cyanogrammus*. Mus. Lugd. Müller.
4. — *euteles*. Mus. Lugd. Müller.
5. — *iris*. Mus. Lugd. Müller.
6. *Cacatua citrinocristata*. Mus. Par. Hombr. & Jacq.

## VI. AMBOYNA.

1. *Eclectus grandis*. Mus. Lugd.
2. *Geoffroius personatus*. Mus. Lugd. Forsten.
3. *Lorius tricolor*. Mus. Lugd. Müller.
4. *Eos rubra*. Mus. Lugd.
5. — *reticulata*. Mus. Lugd.
6. — *cyanostriata*. Mus. Lugd.
7. *Trichoglossus hæmatodus*. Mus. Lugd. Müller.

## VII. CERAM.

1. *Tanygnathus megalorhynchus*. Mus. Lugd.
2. *Eos squamata*. Mus. Lugd.
3. *Trichoglossus hæmatodus*. Mus. Lugd. Forsten.
4. *Cacatua moluccensis*. Mus. Lugd. Forsten.

## VIII. BATCHIAN.

1. *Tanygnathus megalorhynchus*. Mus. Brit. Wallace.
2. *Polychlorus magnus*. — —
3. *Geoffroius cyaneicollis*. — —
4. *Lorius garrulus*. — —
5. *Eos riciniata*. — —
6. *Trichoglossus placens?* — —
7. *Cacatua cristata*. — —

## IX. TERNATE.

- |                                   |            |   |
|-----------------------------------|------------|---|
| 1. <i>Polychlorus magnus</i> .    | Mus. Lugd. |   |
| 2. <i>Eos riciniata</i> .         | —          | — |
| 3. <i>Trichoglossus placens</i> ? | —          | — |
| 4. <i>Cacatua cristata</i> .      | —          | — |

## X. GILOLO.

- |  |            |   |
|--|------------|---|
| 1. <i>Tanygnathus megalorhynchus</i> . | Mus. Lugd. |   |
| 2. <i>Geoffroiis cyaneicollis</i> .    | —          | — |
| 3. <i>Aprosmictus hypophonius</i> .    | —          | — |
| 4. <i>Lorius garrulus</i> .            | —          | — |
| 5. <i>Eos riciniata</i> .              | —          | — |
| 6. — <i>coccinea</i> .                 | —          | — |

## XI. WAIGIOU.

- |                                     |           |         |
|-------------------------------------|-----------|---------|
| 1. <i>Psittacodis stavorinii</i> .  | Mus. Par. | Lesson. |
| 2. <i>Chalcopsitta rubiginosa</i> . | —         | —       |

## XII. NEW GUINEA.

- |  |            |          |
|--|------------|----------|
| 1. <i>Eclectus cardinalis</i> .        | Mus. Brit. | Wallace. |
| 2. <i>Geoffroiis pucheranii</i> .      | —          | —        |
| 3. <i>Opopsitta diopthalma</i> .       | —          | —        |
| 4. — <i>desmaresti</i> .               | —          | —        |
| 5. <i>Aprosmictus dorsalis</i> .       | —          | —        |
| 6. <i>Lorius tricolor</i> .            | —          | —        |
| 7. <i>Eos fuscata</i> .                | —          | —        |
| 8. <i>Chalcopsitta atra</i> .          | Mus. Par.  | Lesson.  |
| 9. <i>Trichoglossus nigrigularis</i> . | Mus. Brit. | Wallace. |
| 10. — <i>placens</i> .                 | Mus. Brit. | Wallace. |
| 11. <i>Charmosyna papuana</i> .        | Mus. Par.  | Lesson.  |
| 12. — <i>pulchella</i> .               | Mus. Brit. | Wallace. |
| 13. <i>Cacatua triton</i> .            | Mus. Lugd. | Müller.  |
| 14. <i>Microglossum aterrimum</i> .    | Mus. Lugd. | Müller.  |
| 15. <i>Dasyptilus pecquetii</i> .      | Mus. Lugd. |          |
| 16. <i>Nasiterna pygmæa</i> .          | Mus. Lugd. | Müller.  |

## XIII. MAFORS ISLANDS (in the Bay of Geelvink).

- |                               |            |          |
|-------------------------------|------------|----------|
| 1. <i>Lorius cyanauchen</i> . | Mus. Brit. | Wallace. |
| 2. <i>Eos cyanogenia</i> .    | Wallace.   |          |

## XIV. ARU ISLANDS.

- |  |            |          |
|--|------------|----------|
| 1. <i>Eclectus cardinalis</i> ?        | Mus. Brit. | Wallace. |
| 2. <i>Polychlorus magnus</i> .         | —          | —        |
| 3. <i>Geoffroiis aruensis</i> .        | —          | —        |
| 4. <i>Opopsitta diopthalma</i> .       | —          | —        |
| 5. <i>Chalcopsitta scintillans</i> .   | —          | —        |
| 6. <i>Trichoglossus nigrigularis</i> . | —          | —        |
| 7. — <i>coccineifrons</i> .            | —          | —        |
| 8. — <i>placens</i> .                  | —          | —        |
| 9. <i>Cacatua triton</i> .             | —          | —        |
| 10. <i>Microglossum alecto</i> .       | —          | —        |

## XV. SALOMON ISLANDS.

1. *Geoffroius heteroclitus*. Mus. Par. Hombr. & Jacq.
2. *Lorius chlorocercus*. Mus. Brit. Macgillivr.
3. *Eos cardinalis*. Mus. Par. H. & J.
4. *Trichoglossus massena*. Mus. Brit. Macgillivr.
5. *Cacatua ducorsii*. Mus. Par. H. & J.

5. NOTE ON THE SPECIES OF THE GENUS PITHECIA, WITH THE DESCRIPTION OF A NEW SPECIES, *P. ALBICANS*. BY DR. JOHN EDWARD GRAY, F.R.S., V.P.Z.S., ETC.

(Mammalia, Pl. LXXXI.)

Buffon, in his 'Histoire Naturelle,' gives three figures of the animals of this genus; they are not easily recognized; and, according to M. I. Geoffroy, he is said to have figured one species and to have taken his description from another (see Cat. Méthod. p. 55).

M. Geoffroy the elder, in his 'Tableau des Quadrumanes,' published in 1812, noticed four species, viz. *P. leucocephala*, *P. miriquouina*, *P. rufiventer*, and *P. monachus*. The specimens then in the collection on which they were established were imperfect or young, and it has been found very difficult to assign these names with certainty to the specimens which have been recently collected.

Dr. Kuhl, who took the trouble to examine the original specimens in the Paris Museum, and to study the species existing at that time, viz. 1820, after more carefully describing the specimens named by Geoffroy, and those received between 1812 and 1820 by the Paris Museum, and also those in the Prince Maximilian's and Temminckian Museum at Leyden, added two others to Geoffroy's list, viz. *P. rufibarbata*, and *P. ochrocephala* (from a specimen in the Temminckian collection). M. Temminck, however, has considered (and Fischer has followed his lead) that *P. ochrocephala* is the female or young of *P. leucocephala*, and *P. rufibarbata* the same as *P. rufiventer* of Geoffroy and Kuhl. I think, from Dr. Kuhl's description, that his account of the subannulated hair may probably be correct,—the peculiar pointed form of the tail, which Dr. Kuhl says distinguishes it from all other *Pitheciæ*, being dependent on its having been kept in a menagerie. But the description of *P. ochrocephala* does not agree with any specimens of the genus I have seen. In the division of the hair on the forehead it agrees with *P. chrysocephala* of Isidore Geoffroy; but then, that species, as far as I have seen, never has the upper side of the tail and the outside of the limbs chestnut-brown. Can it be a *Callithrix*?

I may here observe that the *Pithecia miriquouina*—which both Geoffroy and Kuhl describe from one specimen, if not more, in the Paris Museum, and which has been called *Simia azara* by Cuvier and Humboldt, and is referred by Dr. Kuhl to *P. adusta* of Illiger with doubt, and is evidently very distinct, according to these authors—has







somehow dropped out of the modern works. It is nowhere to be found in M. Isidore Geoffroy's Catalogue of the American Monkeys now in the Paris Collection. What is, or was, it?

Spix, in his large work on the Monkeys and Bats of Brazil, figured and described three species as new, viz. :—

1. *P. hirsuta* (p. 14. t. 9), which Fischer (Syn. Mamm.) arranged with the subgenus *Chiropotes*; but it is evidently a true long-tailed *Pithecia*, and very probably *P. monachus*.

2. *P. inusta* (p. 15. t. 10 ♂), which Fischer considers as distinct, and I believe that it is most probably the *P. chrysocephala* of M. I. Geoffroy; but the line in the centre of the forehead has been overlooked, if it exists; otherwise it agrees with that animal pretty well.

3. *P. capillamentosa* (p. 16. t. 11 ♀). Fischer considered this to be the same as *P. rufiventer* of Geoffroy and Kuhl, which appears very probable. But they are all so indistinctly figured and described, that it is very difficult to refer them with certainty to any of the described species.

Some specimens of this genus having been obtained by the British Museum, I was induced, in the 'Zoology of the Voyage of H.M.S. Sulphur,' published in 1842, to describe and figure the three species then in the Collection, and to give as correct an account of their synonyms as the means at my disposal then allowed. This must now be corrected by the additional information respecting the original specimens given in the Catalogue of M. Isidore Geoffroy.

In the 'Catalogue Méthodique de la Collection des Mammifères,' in the Paris Museum, published in 1851 by M. Isidore Geoffroy Saint-Hilaire, he indicates five species of the long-tailed *Pithecia*, adding to the three species described by his father (viz. *P. leucocephala*, *P. rufiventer*, and *P. monachus*), *P. chrysocephala* and *P. albinasa*. The two latter he also describes at greater length in his paper on 'New Primates,' in the fifth volume of the 'Archives du Muséum,' giving a good figure of *P. chrysocephala*.

I may here observe, that two of the species which I regarded as new in the 'Zoology of the Sulphur'—viz. *P. pogonias* and *P. irrorata*—appear, according to the account of M. Isidore Geoffroy, to have been previously described by his father, though M. Isidore Geoffroy does not refer to them in his synonyms. Again, that which I have considered to be the *P. leucocephala* of his father is evidently the species which M. Isidore Geoffroy has described and figured as new, under the name of *P. chrysocephala*; and here also he neglects to make the reference to the prior description and figure.

We have in the British Museum thirteen specimens of this genus. They evidently belong to four very distinct species, of which three are those I described in the 'Zoology of the Voyage of H.M.S. Sulphur,' and the fourth the new one now first noticed, as far as I have been able to discover.

The species may be divided into two sections :—

- I. *The head and sides of the face covered with abundance of adpressed hair, which is longer on the sides of the chin in front of the ears; the forehead with a bald central longitudinal streak.*

1. *PITHECIA CHRYSOCEPHALA.*

*Pithecia chrysocephala*, I. Geoffroy, Compt. Rendus, xxxi. 1850, p. 875; Cat. Mamm. p. 55; Arch. du Mus. v. p. 557. t. 29.

*P. leucocephala*, Gray, Zool. Sulphur, p. 12. t. 2 (head).

*P. inusta*, Spix, Bras. p. 15. t. 10 ♂.

*Hab.* Brazil?

The character which Dr. Kuhl gives of the longitudinal line on the forehead and the short yellow hair on the head of his *P. ochrocephala*, which he described from a species in the Temminckian Collection, makes me think that species must be very nearly allied to *P. chrysocephala*; but it differs from it in the upper side of the tail and outer side of the limbs being chestnut: could this have arisen from the specimen having been in confinement?

- II. *The head covered with hair directed forwards; the face with distant hairs, rather divergent from the centre on the forehead, and more abundant, forming a kind of moustache on each side of the nose in front of the eyes; all more or less deciduous on the older specimens, which often have a bald face; forehead without any distinct naked central line.*

2. *P. MONACHUS.*

*P. monachus*, Geoff. & Kuhl, Beitr. p. 45; from a very young specimen in a bad state.

*P. irrorata*, Gray, Zool. Sulphur, p. 14. t. 3, adult.

*P. hirsuta*, Spix, Bras. p. 14. t. 9.

Black: hair elongate, with elongated white tips; hair of the head rather elongated.

*Adult.*—Face nearly bald, *l. c.* t. 3.

*Young.*—Face hairy, black, with white moustache in front of the eyes and side of the chin.

*Hab.* Rio Negro.

3. *P. RUFIVENTRIS.*

*P. rufiventer*, Geoff. *l. c.*

*P. pogonia*, Gray, Ann. and Mag. N. H. 1842, p. 256; Zool. Sulphur, p. 13. t. .

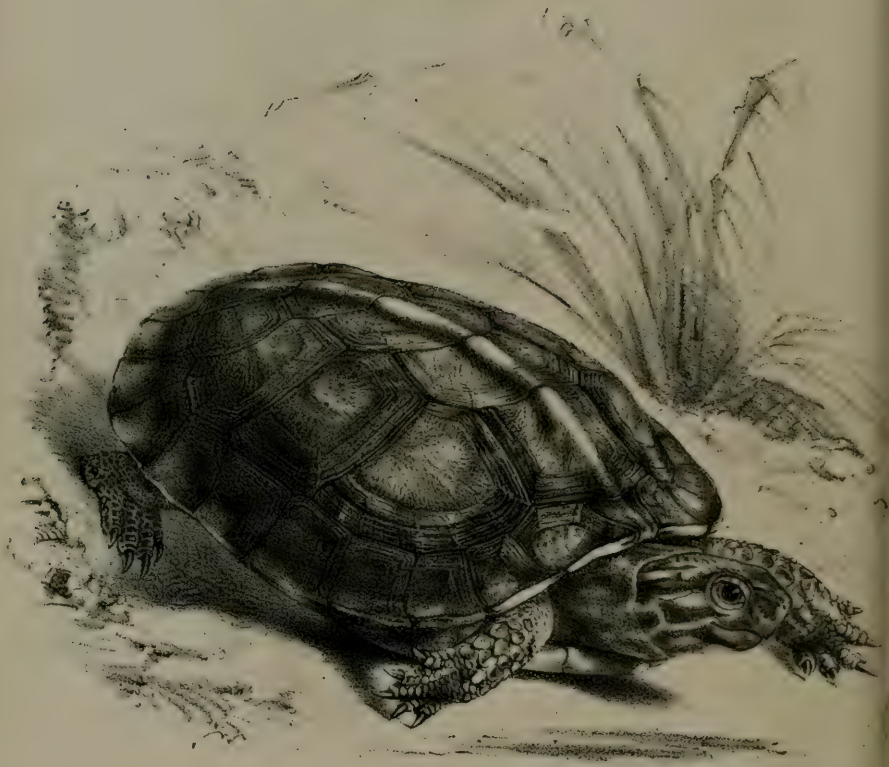
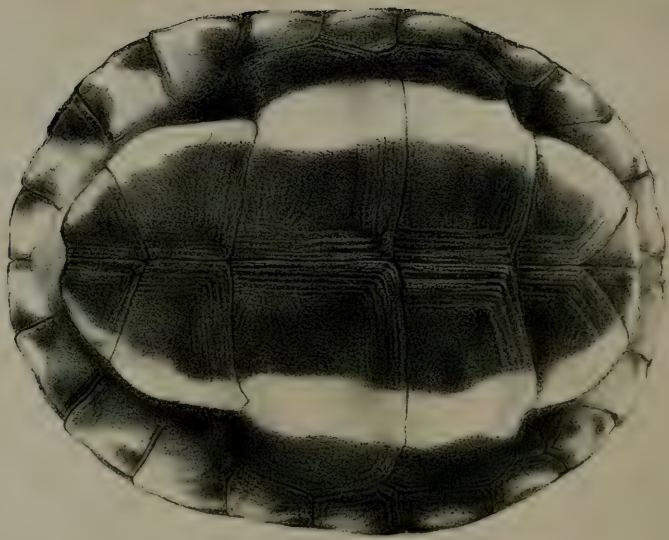
*P. capillamentosa*, Spix, Bras. t. 11.

*Saki*, Buffon.

Black: the hair elongate, with a subterminal yellowish ring with a very short slender blackish tip beyond it; hair of the head moderately elongated; moustache bright yellow, very distinct, but formed of short adpressed hair; chest and belly reddish; face blackish.

*Hab.* Brazil.





CH Ford

*Geoclemmys annulata*

W West imp

The four species in the Museum, of different ages, from young to adult, scarcely vary from one another.

4. *P. ALBICANS.* (Pl. LXXXI.)

Hair very long and loose; that of the head, neck, and upper part of the thighs whitish; that of the shoulders, back, sides, tail, and fore legs black, with short white tips; on the hind legs, sides of the neck, inside of limbs, chest and belly, reddish. The hair of the head very long, covering a great part of the face.

*Young.*—Hair of the head, neck, and shoulders very long (longer than in the adult), blackish near the roots, and on the under side of the body rather more rufous; the moustaches more distinct.

*Hab.* Brazil; Upper Amazon (*Mr. Bates*).

The following species appear to be distinct from the above:—

1. *Pithecia leucocephala*, Geoffroy; Kuhl, Beitr. p. 45, which the latter says is well figured as the *Yarqué* by Audebert (*Singes*, 6. sect. 1. f. 2), and which he describes thus:—"Nigra; capite albo; omnibus pilis corporis unicoloribus longissimis, caudalibus præsertim, capitis autem albis brevibus."

The young male, adds M. I. Geoffroy, "diffère de l'adulte par le ventre d'un brun roussâtre, le pelage tiqueté sur les parties latérales, et surtout par la tête revêtue de poil en partie noir. Chez les adultes les poils de la tête sont entièrement d'un blanc lavé de jaune, qui passe au jaune sur les joues."

2. *P. albinasa*, Geoff. Cat. Mamm. p. 56; Arch. du Mus. v. 559.

"Espèce distincte dès le premier aspect, par son nez couvert de poil ras, dont la blancheur contraste avec le reste de la face et tout le pelage, qui sont d'un noir profond."

*Hab.* Para, Brazil.

6. DESCRIPTION OF A NEW SPECIES OF *GEOCLEMMYS* FROM ECUADOR. BY DR. J. E. GRAY, F.R.S., V.P.Z.S., ETC.

(Reptilia, Pl. XXIX.)

Mr. Cuming has lately sent to the Museum two shells of a species of Freshwater Tortoise, and a younger specimen, in spirits, of the same animal, obtained by Mr. Fraser at Esmeraldas, on the western coast of Ecuador.

*GEOCLEMMYS ANNULATA.* (Pl. XXIX.)

Shell oblong, subquadrangular, black, slightly and irregularly varied with yellow; the vertebral plates square, almost as long as broad, with a compressed flat-topped anterior keel, highest on the fourth vertebral plate, which is narrower behind; margin sub-entire, with a triangular yellow spot on the under side of each plate; nuchal

plate distinct; sternum flat, rounded on the sides, black, with a broad yellow band, forming a ring round the margin.

*Hab.* Esmeraldas, Ecuador.

The adult shell has much the external appearance of a Land Tortoise of the genus *Testudo*, but it has the divided caudal plate of the *Emydae*. The nuclei of the vertebral plates are posterior and submarginal; those of the costal plates are placed in the upper hinder angle; the horny shields of these plates are concentrically grooved. The sternum is flat, rather suddenly bent up and truncated in front, and slightly curved, and with a deep triangular notch behind: the broad yellow ring on this part gives it a very distinct appearance.

The young specimen, with the animal preserved in spirits, is black like the adult, but the back is much lower and rather concave in the middle, with a very strong, yellow, rounded keel. The hinder margin is slightly, and the front lateral margin is strongly, turned up at the edge. The head is rather small and black, the crown, the temple, and the neck being varied with broad white streaks or spots. The limbs are black, with a few broad white streaks and some white spots. The front of the fore legs is covered with cross rows of large scales; the soles of the feet with larger scales; the rest of the legs is covered with small granular scales; the hinder edge of the fore feet with three or four acute shields; the outer edge of the hind feet, marking the rudimentary outer hind toe, is edged with larger shields. Toes 5-4, short, thick, conical, only very slightly webbed at the base, and covered above and on the sides with three series of rather large shields. Tail short, conical, with rings of small black scales.

7. DESCRIPTION OF A NEW SPECIES OF EMYS LATELY LIVING IN THE GARDENS OF THE ZOOLOGICAL SOCIETY. BY DR. J. E. GRAY, F.R.S., V.P.Z.S., ETC.

(Reptilia, Pl. XXX.)

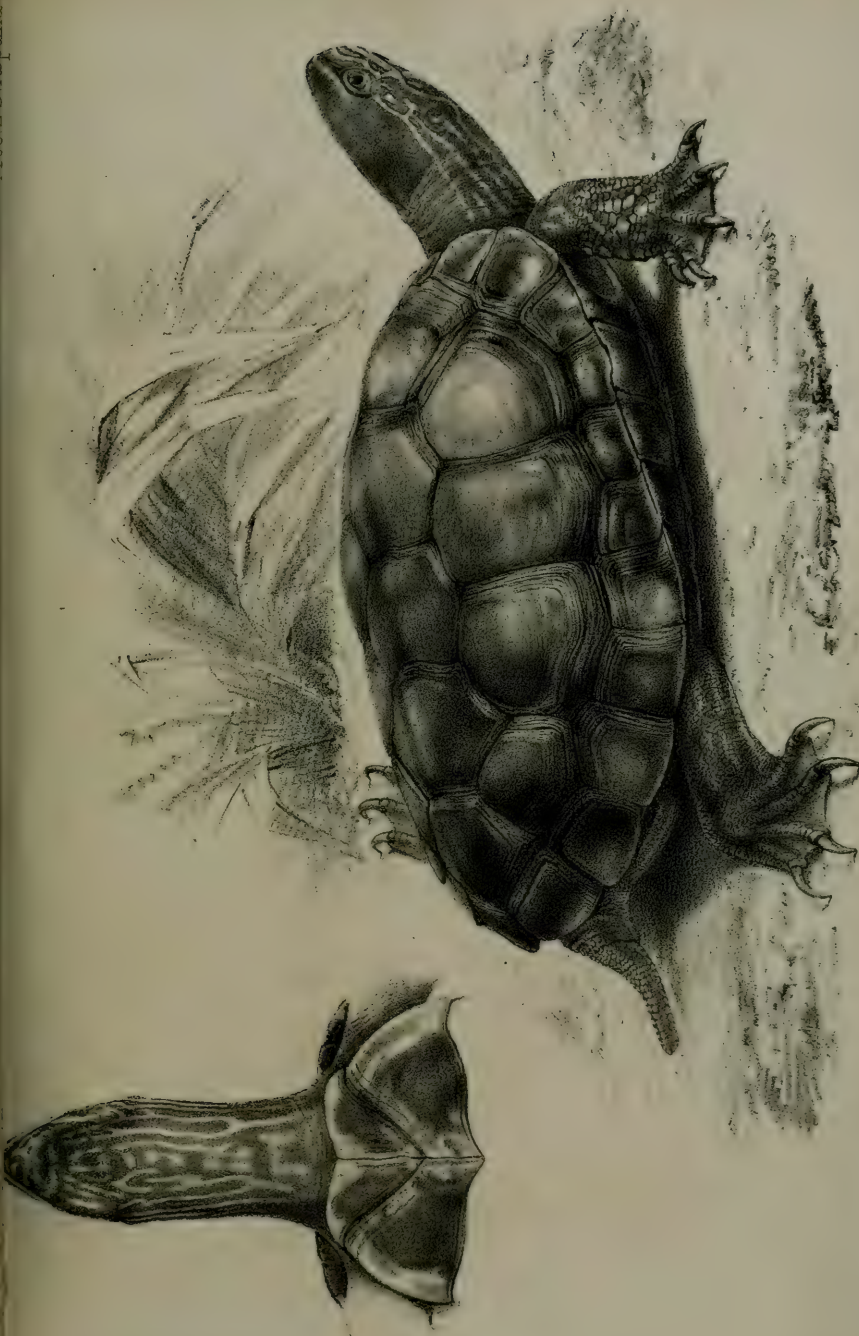
The British Museum has lately received from the Zoological Society a specimen of an *Emys* which has recently died in the Gardens. It is believed to have been one of five specimens brought from Egypt by C. W. Domville, Esq., in 1852; but this is not certain. It is quite distinct from any which have hitherto come under my observation.

EMYS FULIGINOSUS, (Pl. XXX.)

Depressed, flexible, black. Shields convex, rather irregular, with deep, irregular, subconcentric grooves of unequal depression. Under-side black, with white blotches on the front margin of the sternum and on the inner edge of the central marginal plates near the sterno-costal suture, and a small irregular white blotch on the middle of the under side of the front marginal plates. Head rather depressed; crown covered with a continuous, smooth, rather horny skin. Jaws mottled with sinuous white lines or spots; sides of the neck with



EMYS FULIGINOSUS

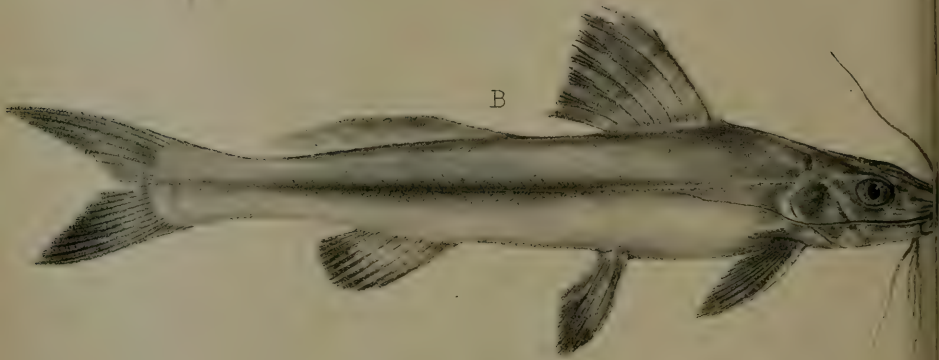




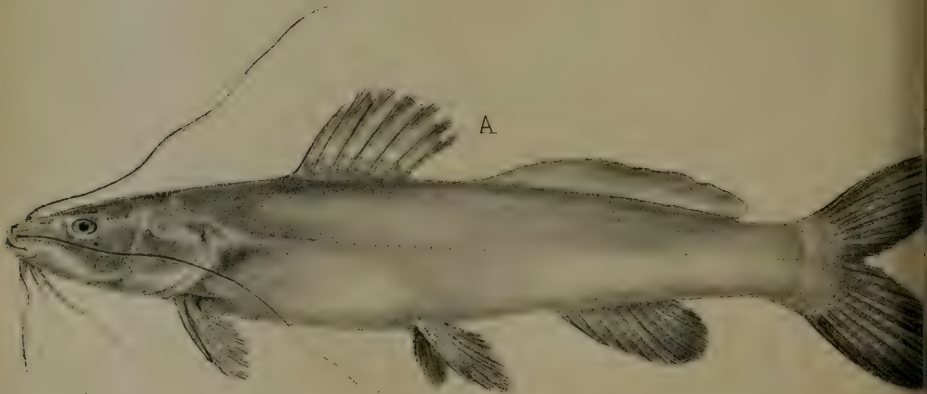




C



B



A

A. PIMELODUS CINERASCENS. *Gehr.*

B. \_\_\_\_\_ ELONGATUS. *Gehr.*

C. \_\_\_\_\_ MODESTUS. *Gehr.*

narrow white lines; the chin and throat mottled with broader white streaks, often interrupted or coalescing, or short and sinuous; the temple with a distinct round white spot, with two or three small white dots in front of it; the tympanum with a central white spot, and edged with a white streak in front. Legs and feet black; the front of the fore legs varied with white irregular streaks or spots, especially on the inner side, and with a white streak down the centre of the upper side of each toe. Toes distinctly webbed; claws rather elongate, curved, acute, black, with pale edges; the toes with a single central series of larger scales above. Fore legs with four large conical scales on the outer part of the upper side, and with a cross series of three square scales on the under side of the wrist. The hind legs and feet covered with equal, small triangular scales. Tail conical, black, with two transverse streaks before the vent.

*Hab.* North Africa?

8. THIRD LIST OF COLD-BLOODED VERTEBRATA COLLECTED BY MR. FRASER IN ECUADOR. BY DR. ALBERT GÜNTHER.

(Pisces, Pl. X.)

The third collection of Reptiles and Fishes sent by Mr. Fraser contains specimens from Guayaquil and from Esmeraldas. Several of the species are new; these are marked with an asterisk; others have been described in the former accounts †.

1. *Species from Guayaquil.*

1. *Anolis fraseri*, Gthr.
2. *Cnemidophorus undulatus*, Wieg.
3. \**Typhlops*, n. sp. (a single very young specimen).
4. *Dryophis (Coluber) acuminatus*, Wied.
5. \**Eleotris*, n. sp. †
6. \**Pimelodus cinerascens*, Gthr.
7. *Macrodon tareira*, Cuv. & Val.

2. *Species from Esmeraldas.*

1. \**Geoclemmys annulata*, Gray.
2. *Ameiva sex-scutata*, Gthr.
3. *Basiliscus seemanni*, Gray.
4. *Iguana tuberculata*, Laur.
5. *Anolis fraseri*, Gthr.
6. *Camilia jamaicensis*, Gray.
7. *Boa constrictor*, L.
8. \**Coryphodon rhombifer*, Gthr.
9. *Herpetodryas brunneus*, Gthr.
10. *Bufo aqua*, Latr.

† Proc. Zool. Soc. 1859, pp. 89, 402.

‡ The new species of the *Gobioidei* will be described in my 'Catalogue of Acantopterygian Fishes.'

11. *Gobius*, sp.
12. *Lembus maculatus*, Gthr.
13. *Chromis rivulata*, Gthr.
14. \**Pimelodus cinerascens*, Gthr.
15. \**Pimelodus elongatus*, Gthr.
16. \**Pimelodus modestus*, Gthr.
17. *Lebiasina bimaculata*, Cuv. & Val.
18. \**Brycon dentex*, Gthr.
19. *Tetragonopterus rutilus*, Jenyns.

3. *Descriptions of the New Species, and additional Remarks on some others.*

AMEIVA SEX-SCUTATA, Gthr. Proc. Zool. Soc. 1859, p. 402.

Two very fine specimens, and larger than the former, are in the collection. We see by them that the frontal, parietal, and occipital shields lose their regular arrangement with age, and are replaced by many small, irregular, keeled shields. The bands become more indistinct, though they are visible. In every other respect, especially in the number of the ventral plates, these specimens agree completely with that described *antè*, page 402.

	inches.	lines.
Length of the head . . . . .	1	2
——— of the trunk . . . . .	3	4
——— of the tail . . . . .	13	0
Total length . . . . .	17	6

BASILISCUS SEEMANNI (*Craneosaura seemanni*, Gray in Voy. Herald, Zool. p. 148, pl. 25).

*Diagnosis.*—The basal portion of the crest of the head swollen, its upper and posterior profiles rounded; the crest along the back and tail low. Scales of the breast slightly keeled. The upper parts greenish or brownish; the back with irregular brown or ferruginous cross-bands; side of the body without longitudinal band; two white bands, the one from the angle of the mouth, the other from the chin, to the posterior extremity of the mandibula; a black band between. Beneath uniform white; throat with a blackish streak on each side.

*Hab.* Esmeraldas.

*Description.*—I abstain from giving a detailed description of the general form and of the scales of this species, as Dr. Gray has given a very good figure of an old specimen, and as it is nearly allied to *Basiliscus (Corythæolus) vittatus*, from which, however, it may be readily distinguished by the occipital crest, which is rounded posteriorly, and not angular, and by its different coloration. *This species is herbivorous, as probably all the species of Basiliscus are.*

The series of the different ages and sexes being very complete, I will point out some remarkable changes which this species undergoes:—

1. In a very young specimen—head and trunk 2 inches, tail 4 inches in length—the head is very short; the occiput globular, without any

trace of a crest; the dorsal and caudal crests are visible; the posterior extremities are comparatively very long, extending far beyond the end of the snout, if laid forwards; the toes are distinctly fringed. The bands on the back are blackish; the streaks on the side of the head very distinct.

2. A somewhat larger specimen—head and trunk  $2\frac{1}{2}$  inches, tail  $5\frac{1}{2}$  inches in length—agrees with the former in all the points mentioned; but the occiput is flatter, with a slight transverse swelling posteriorly, in the middle of which a feeble and short ridge indicates the development of the occipital crest.

3. In a specimen of 11 inches in length—head and trunk 3 inches, tail 8 inches—the snout is more produced, and has the form of that of an adult; the occiput is flat, produced posteriorly in a small compressed protuberance, which is not elevated above the level of the crown; the head, in this state, resembles somewhat that of *Chamaeleopsis*.

4. In a mature female—head and body 6 inches, tail 15 inches in length—the occiput is produced posteriorly into a flat protuberance provided with a low crest, about a line high along its middle; the protuberance and the crest are covered with very small scales. The hinder extremities extend as far as the end of the snout. Dorsal and caudal crests very low. The head and the neck are ferruginous, with the lateral bands yellowish; the ground-colour of the body and of the extremities is of a beautiful grass-green. A series of short reddish-brown bands along the back; the upper parts of the extremities with cross-bands of the same colour; tail with alternate brown and green rings; the lower parts yellowish. No pouch on the throat.

5. In a mature male—head and trunk 6 inches, tail 17 inches in length—the protuberance is swollen, elevated, and bears a thin, semi-circular crest, half an inch high; the protuberance and crest are covered with polygonal shields; the dorsal and caudal crests are rather low; the hinder extremities extend as far as the end of the snout, if laid forwards. The ground-colour of the head and body is dark green; the brown bands on the back are indistinct, those of the tail and the extremities clearly visible. A small pouch at the throat. The intestines contained seeds of various plants.

6. In an old male—head and body 7 inches, tail 21 inches—the basal protuberance is very large, extending over the whole neck; the thin part of the crest is semielliptical, covered with polygonal shields; the scales, by which the dorsal crest is formed, are about 1 line high. The ground-colour is greenish-brown, the markings being the same as in the former specimen.

*ANOLIS FRASERI*, Gthr. Proc. Zool. Soc. 1859, p. 407.

The species is represented by several varieties with regard to the coloration.

Var. *a*. Nearly uniform greyish- or brownish-olive; tail with indistinct brown rings.

Var. *β*. Body ferruginous, with broad, irregular brown bands across the back; anterior part of the head yellowish, with a brown band round the snout and another between the eyes; extremities

light brown, marbled with darker; joints yellowish; tail brownish-yellow.

Var.  $\gamma$ . A broad band along the back and the tail reddish-yellow; snout, a band between the eyes, and symmetrical spots on the occiput brown; sides of the body and extremities light brown, marbled with darker shining golden.

*Hab.* Ecuador; Guayaquil; Esmeraldas.

**CORYPHODON RHOMBIFER, n. sp.**

*Diagnosis.*—Scales keeled, in seventeen rows; nine upper labial shields, the fourth, fifth, and sixth of which enter the orbit. Eye large. Brownish-grey: a series of rhombic ferruginous spots along the back, each spot having two of the four edges black; belly whitish, marbled with blackish on the sides.

*Hab.* Esmeraldas.

*Description.*—The maxillary teeth become gradually longer posteriorly. The head is of moderate size, broader behind; the eye is large, its horizontal diameter being two-thirds of the length of the snout. Rostral shield rounded; the anterior frontals are rather more than one-half the size of the posterior; the vertical five-sided, tapering behind, with the posterior sides very short; the occipital shields are of moderate size, and diverge posteriorly, forming a rectangular notch. The nostril is wide, and situated almost entirely in the anterior nasal. The loreal and anteorbital are large, and the latter does not extend on to the vertical; two posterior orbitals. Three temporals, the two anterior of which are in contact with the orbitals; the posterior is rhombic, and equal in size to the two others together. Nine upper labials, the fourth entering the angle of the orbit. The scales are keeled, in seventeen rows, the outer series being smooth. Ventral plates 165; anal bifid. (Tail mutilated.)

The upper parts are brownish-grey; a series of thirty-four rhombic ferruginous spots occupies the back of the trunk; each spot has two opposite edges black; the spots become more distinct posteriorly, and are continued on the tail. The sides of the belly are marbled with blackish, as in *C. pantherinus*.

	inches. lines.	
Length of the head . . . . .	1	4
— of the trunk . . . . .	31	0
— of the tail (restored) . . . . .	11	0
Total length . . . . .	43	4

**LEMBUS MACULATUS, Gthr. Catal. Acanthopt. i. p. 505.**

Several beautifully preserved specimens are in the collection. The fish has a prominent papilla near the vent, and is nearly allied to *Philypnus*. The blackish bands appear after the fish has been preserved in spirits for some time. All the markings are beautifully red during life: the streaks radiating from the eye, the dots on the body and on the fins, those on the soft dorsal, anal, and caudal are intermixed with yellow ones. A red spot and, above it, a black one on the upper portion of the root of the pectoral. The caudal is convex.

*Hab.* Fresh waters of Ecuador; Esmeraldas.



*PIMELODUS CINERASCENS*, n. sp. (Pl. X. fig. A.)

B. 7. D. 1/6. A. 4/9. V. 1/5. P. 1/9.

The body is somewhat elongated, compressed posteriorly. Head broad, truncated anteriorly, depressed, rather short; its length is contained four times and three-fifths in the total length of the fish. The snout is short, one-third the length of the head, truncated, with the upper jaw slightly longer; the distance between the angles of the mouth is nearly one-half the length of the head. Six barbels: that of the maxillary reaches nearly to, or somewhat beyond, the base of the ventrals; the exterior pair of the mandibulary barbels is not quite twice as long as the interior, and extends beyond the base of the pectorals; the interior pair are inserted somewhat before the outer ones, and more remote from each other than from the outer ones. The eye is distant from the snout two and a half of its diameters, and four from the extremity of the operculum; the width of the inter-orbital space is contained twice and two-thirds in the length of the head. The head is covered superiorly with a thin, smooth skin; the occipital process is rather short, hidden by the skin, and the notches on its side are moderately deep and semicircular. The lower margin of the operculum is straight, not notched. The depth of the body, taken above the origin of the anal, is one-eighth of the total length; that of the tail, before the caudal, one-thirteenth. The pectoral extends somewhat beyond the vertical from the origin of the dorsal; its spine is stout, compressed, not much shorter than the soft rays, and its sharp outer edge is armed with recurved spines. The ventral, with a feeble spine, is inserted behind the dorsal, and does not extend to the origin of the anal. The distance of the dorsal from the head (concavity of the notch) equals the length of its base; its spine is feeble; the margin straight, rounded posteriorly. The adipose fin is very long, its distance from the dorsal and caudal being equal. Caudal deeply notched, with the lobes rounded. The length of the base of the anal equals its distance from the caudal; the undivided rays are very feeble, and its margin is rounded.

Above uniform greenish-grey, beneath white; the outer parts of the vertical fins are blackish, and there is a blackish spot between the first and second dorsal rays.

*Hab.* Fresh waters of Guayaquil and Esmeraldas.

	inches.	lines.
Total length . . . . .	7	6
Length of the head . . . . .	1	7
— of the snout . . . . .	0	6
Distance between the eyes . . . . .	0	7
— between the angles of the mouth . . . . .	0	9
Diameter of the eye . . . . .	0	2½
Height of the body above the anal . . . . .	0	11
— of the tail . . . . .	0	7

This species is distinguished from *P. sebæ* by the position of the eyes, shorter maxillary barbel, &c.; from *P. pentlandii* by a non-emarginated operculum.

**PIMELODUS ELONGATUS**, n. sp. (Pl. X. fig. B.)

B. 6. D. 1/6. A. 11. V. 1/5. P. 1/9.

The body is elongated, compressed posteriorly; head moderately broad and long, depressed, truncated anteriorly; its length is contained six times and two-thirds in the total length of the fish. The snout is rather produced, nearly one-half the length of the head, truncated, with the upper jaw longest. The distance between the angles of the mouth is nearly equal to the length of the snout. Six barbels: that of the maxillary reaches nearly to the extremity of the pectoral fin; the exterior pair of the mandibular barbels are two-thirds the length of the interior, and extend to the base of the pectoral; the interior pair are inserted somewhat before the outer ones, and rather more remote from each other than from the outer ones. The diameter of the eye is one-fourth of the length of the head, and nearer to the extremity of the operculum than to that of the snout. The width of the interorbital space is to the length of the head as 2:7. The head is covered superiorly with a very thin and smooth membrane; the occipital process is long, and extends on to a small bony plate in front of the dorsal; this plate is also covered with skin, like the head. The lower edge of the operculum is straight; the spine of the humeral bone is very indistinctly striated. The depth of the body, taken below the origin of the dorsal, is one-eighth of the total length; that of the tail, before the caudal, one-sixteenth. The pectoral extends to below the middle of the dorsal fin; its spine is shorter than the first rays, stout, compressed, with the interior edge spiny. The ventral has the first ray undivided, flexible; it is inserted immediately behind the vertical from the dorsal, and does not extend on to the anal. The dorsal is higher than long; the length of its base equals its distance from the head; the spine is slender, stiff, pungent, provided superiorly with a ray-like filament. The adipose fin is very long, its distance from the dorsal and caudal fins being nearly equal. Caudal deeply notched, with the lobes pointed; the upper lobe is longer than the inferior, and its length is one-fifth of the total. The length of the base of the anal is  $1\frac{2}{3}$  in its distance from the caudal; its margin is convex. Above uniform greyish, beneath whitish; lateral line blackish; dorsal and caudal minutely dotted with black.

*Hab.* Fresh waters of Esmeraldas.

	inches.	lines.
Total length . . . . .	6	8
Length of the head . . . . .	1	0
——— of the snout . . . . .	0	$5\frac{1}{2}$
Distance between the eyes . . . . .	0	$3\frac{1}{2}$
——— between the angles of the mouth . . . . .	0	$5\frac{1}{3}$
Diameter of the eye . . . . .	0	3
Height of the body . . . . .	0	10
——— of the tail . . . . .	0	5
——— of the first dorsal ray . . . . .	1	1
Length of the upper caudal lobe . . . . .	1	4

*PIMELODUS MODESTUS*, n. sp. (Pl. X. fig. C.)

B. 6. D. 1/6. A. 4/8. V. 1/5. P. 1/8.

The body is rather elongated, slightly compressed posteriorly; head moderately broad and long, depressed, truncated anteriorly; its length is contained five times and a half in the total length of the fish. The snout is somewhat produced, broad, contained twice and three-fifths in the length of the head, truncated, with the upper jaw longest. The distance between the angles of the mouth is nearly equal to the length of the snout. Six barbels: that of the maxillary reaches to the origin of the anal; the exterior pair of the mandibular barbels are two-thirds the length of the interior, and extend to the middle of the pectoral fin; the interior pair are inserted somewhat before the outer ones, and rather more remote from each other than from the outer ones. The diameter of the eye is one-fourth of the length of the head, and equals the width of the interorbital space; it is situated in the middle of the length of the head. The head is covered superiorly with a very thin and smooth skin; the occipital process is long, and extends on to a triangular plate in front of the dorsal; this plate is also covered with skin, like the head. The lower edge of the operculum is straight; the spine of the humeral bone very indistinctly striated. The depth of the body, taken below the origin of the dorsal, is one-seventh of the total length; that of the tail one-thirteenth. The pectoral extends on to below the middle of the dorsal fin; its spine is not much shorter than the rays, stout, compressed, with the interior edge spiny. The ventral has the first ray undivided, flexible; it is inserted immediately behind the vertical from the dorsal, and does not extend on to the anal. The dorsal is somewhat higher than long, and has the upper profile convex; the length of its base is nearly equal to its distance from the head; the spine is slender, stiff, pungent, rough superiorly, and terminating in a ray-like filament. The adipose fin is very long, its distance from the dorsal and caudal fins being nearly equal. Caudal deeply notched, with the lobes pointed; the upper lobe is longer than the inferior, and its length is  $4\frac{3}{4}$  in the total. The four anterior rays of the anal are short, flexible, undivided; the margin of the fin is convex, and the length of its base is  $1\frac{2}{3}$  in its distance from the caudal. Above light greyish, beneath whitish.

*Hab.* Fresh waters of Esmeraldas.

	inches.	lines.
Total length.....	4	9
Length of the head.....	0	$10\frac{1}{2}$
—— of the snout.....	0	4
Distance between the eyes.....	0	$2\frac{1}{2}$
Distance between the angles of the mouth..	0	$4\frac{1}{3}$
Diameter of the eye.....	0	$2\frac{1}{2}$
Height of the body.....	0	8
—— of the tail.....	0	$4\frac{1}{2}$
—— of the second dorsal ray.....	0	$8\frac{1}{2}$
Length of the upper caudal lobe.....	1	0

## LEBIASINA BIMACULATA, Cuv. &amp; Val.

This species has, during life, a red spot on the third scale of the fourth longitudinal series.

## BRYCON DENTEX, n. sp.

D. 11. A. 35. V. 1/8. L. lat. 48. L. transv. 9/7.

Intermaxillary with four, maxillary with a single series of teeth; a series of much stronger ones in the mandibula, and a pair of smaller teeth behind. The mandibular teeth correspond to the posterior series in the upper jaw, the anterior series being free and not covered by the lower jaw. The height of the body is contained three times and three-fifths in the total length, the length of the head five times and one-fifth. The interorbital space is slightly convex, and its width is one-third of the length of the head. The pectoral extends on to the posterior portion of the root of the ventral. The dorsal is as remote from the occiput as from the root of the caudal. Silvery; the lining membrane of the humeral arch and the margin of the anal blackish; the other fins reddish.

*Hab.* Fresh waters of Esmeraldas.

	inches.	lines.
Total length . . . . .	10	0
Height of the body . . . . .	2	8
Length of the head . . . . .	1	11
Width of the space between the eyes . . . . .	0	8

9. DESCRIPTION OF HOMALOCRANIUM LATICEPS, A NEW SNAKE FROM CARTHAGENA. BY DR. ALBERT GÜNTHER.

A Snake presented by Capt. Garth to the British Museum proves to belong to a new species. It was procured at Carthage.

## HOMALOCRANIUM LATICEPS.

*Diagnosis.*—Scales in fifteen rows. Head broad, depressed as in *Elaps*. Seven upper labial shields, the third and fourth of which enter the orbit; two posterior oculars. Above black, with about twenty-three narrow brownish-yellow rings, the first forming a collar; belly brownish-yellow.

*Description.*—This Snake much resembles an *Elaps* in general habit, but there is no fang anteriorly, and the last maxillary tooth is longer than the others, and *appears* to be grooved. The rostral shield is rather low, triangular, and somewhat bent backwards on the upper surface of the head; the anterior frontals are much broader than long, and only one-fourth of the size of the posterior; the vertical is six-sided, not much longer than broad; occipitals moderate. The nostril is between two shields, the anterior of which is the largest; loreal none; one anteorbital. Seven upper labial shields, the second of which is in immediate contact with the posterior frontal; the third and fourth form the lower part of the orbit; the fourth and fifth touch the lower postorbital; the sixth and seventh are

equal in size. Two posterior oculars; two temporals, one behind the other. The median lower labial is triangular; six lower labials, the first pair forming a suture behind the median shield; two pairs of chin-shields, the anterior pair being twice the size of the posterior; there are four pairs of scales between the chin-shields and the first ventral. The scales are smooth, rhombic, in fifteen series. Ventral shields 172; anal bifid. The posterior quarter of the tail is mutilated. The ground-colour of the upper parts is shining black; the anterior part of the snout, a spot on the fifth upper labial, the rings of the body, and all the lower parts, are brownish-yellow. The rings, in this specimen, are one-fourth or one-fifth of the width of the black interspaces, and occupy two or three transverse series of scales; they are sometimes irregular and interrupted; all those on the tail are interrupted, the halves of one side alternating with those of the other; the first ring forms a collar, crossed by a narrow black streak.

	inches.
Length of the head .....	0 $\frac{1}{2}$
— of the trunk .....	17
— of the tail (restored).....	4

10. DESCRIPTION OF A NEW GENUS AND SPECIES OF MOLLUSK.  
BY H. ADAMS, F.L.S.

Genus ACRILLA, H. Adams.

*Testa turrata, imperforata; anfractibus numerosis, longitudinaliter costatis, ad basin prominente, spirali, ad suturas vix conspicua lira munitis. Apertura ovalis, antice vix producta; peristomate imperfecto. Columella reflexa. Labrum simplex.*

Shell turreted, imperforate, many-whorled; whorls longitudinally ribbed, the basal portion with a prominent spiral ridge, which is slightly visible at the sutures. Aperture oval, a little produced in front; peristome incomplete. Columella reflexed. Outer lip simple.

This genus, the type of which is *Aclis acuminata*, H. and A. Adams (*Scalaria acuminata*, Sowerby), appears to belong to the family *Scalariadae*. It has somewhat the form of *Turbonilla*, from which, however, it differs in the nucleus not being sinistral. From *Aclis* it may be distinguished by the whorls being longitudinally instead of transversely ribbed, and from both genera still further by the spiral ridge on the lower portion of the whorls. *Chemnitzia grandis*, Ad. and Reeve, is a second species of *Acrilla*; and I proceed to describe a third, from the Collection of Hugh Cuming, Esq., which is closely allied to *A. acuminata*, but is a much smaller and more slender shell, with the longitudinal ribs stronger and further apart.

ACRILLA GRACILIS, H. Adams.

*A. testa tenui, elongata, nitida, albida; anfractibus rotundatis,*

*longitudinaliter valde costatis, interstitiis laevibus, costis ultra basalem liram extendentibus, anfractibus fasciis pallido-fuscis ornatis; apertura longiore quam lata; columella vix reflexa; labro tenui.*

Shell thin, elongated, shining, whitish; whorls rounded, strongly ribbed longitudinally, the interstices smooth, ribs continued beyond the basal ridge, whorls ornamented with two pale-brown bands; aperture longer than wide; columella slightly reflexed; outer lip thin.

Long. 8, lat. 2 lin.

*Hab.* Mouth of the Indus.

The following list of additions made to the Menagerie by gift and purchase, during the month of March, was read:—

1 Entellus Monkey .....	<i>Presbytes entellus</i> .....	Presented by	(Capt. Rayner Wallace. Mrs. Sweetman. Miss Potter. L. C. Stephenson, Esq. Donor unknown. Mr. Nelson. John Dunn, Esq. Ditto.
1 Vervet Monkey .....	<i>Cercopithecus pygerythrus</i>		
1 Bonnet Monkey .....	<i>Macacus radiatus</i> .....		
1 Ursine Dasyure .....	<i>Dasyurus ursinus</i> .....		
1 Indian Jackal .....	<i>Canis</i> ——? .....		
2 Rhesus Monkeys .....	<i>Macacus rhesus</i> .....		
1 Piping Crow .....	<i>Gymnorhina tibicen</i> .....		
1 Butcher Bird .....	<i>Cracticus destructor</i> .....		
1 Common Goat, fem. ....	<i>Capra hircus</i> , var. ....		
2 Rhesus Monkeys .....	<i>Macacus rhesus</i> .....		
2 Grey-headed Love Birds	<i>Agapornis cana</i> .....		
1 Japanese Bunting .....	<i>Emberiza fucata</i> .....		
1 Curlew .....	<i>Numenius arquata</i> .....		
1 Cornelia's Eclectus .....	<i>Eclectus cornelia</i> .....		
1 Brazilian Macaw .....	<i>Ara severa</i> .....		
1 pair of Snews .....	<i>Mergus abellus</i> .....	Purchased.	
1 pair of Tufted Ducks .....	<i>Fuligula cristata</i> .....		
1 Golden-eyed Duck .....	<i>Clangula glaucion</i> .....		
1 Peccary .....	<i>Dicotyles torquatus</i> .....		
1 Great Salamander .....	<i>Sieboldia maxima</i> .....		
1 Japanese Hawfinch .....	<i>Coccothraustes melanurus</i>		
1 Spider Monkey .....	<i>Ateles beelzebub</i> .....		
1 Ashy-headed Goose .....	<i>Bernicla poliocephala</i> .....		
1 Lemon-breasted Toucan	<i>Ramphastos vitellinus</i> .....		

Of these, *Emberiza fucata*, *Sieboldia maxima*, and *Coccothraustes melanurus* were stated to be exhibited for the first time.

The following list of additions made to the Menagerie by gift and purchase, during the month of April, was read:—

1 Peccary .....	<i>Dicotyles torquatus</i> .....	Presented by	(Mr. Chief Justice Tem- ple of Honduras. Ditto. Ditto. Ditto. M. T. Boswell, Esq. S. Pretor, Esq. S. Silva, Esq. Joseph Chapman, Esq.
2 Curassows .....	<i>Crax globicera</i> .....		
2 Guans .....	<i>Penelope purpurascens</i> ..		
6 Black-boned Fowls .....	<i>Gallus bankiva</i> , var. ....		
1 Crested Ground-Parrakeet	<i>Calopsitta nove hollandie</i>		
1 Wanderoo Monkey .....	<i>Silenus veler</i> .....		
1 South American Monkey	<i>Cebus</i> ——? .....		
1 Bonnet Monkey .....	<i>Macacus radiatus</i> .....		

4 Indigo Buntings .....	<i>Spiza cyanea</i> .....	} Purchased.
2 Balæniceps .....	<i>Balæniceps rex</i> .....	
1 Stump-tailed Lizard .....	<i>Trachydosaurus rugosus</i> ..	
1 Common Agouti .....	<i>Dasyprocta</i> —? .....	
1 Coati-Mondi .....	<i>Nasua fusca</i> .....	
4 American Doves .....	<i>Chamæpelia passerina</i> .....	
2 Red-winged Starlings.....	<i>Agelaius phæniceus</i> .....	
2 Nonpareils .....	<i>Spiza ciris</i> .....	
1 Common Gnu .....	<i>Catoblepas gnu</i> .....	
1 Young Lioness .....	<i>Felis leo</i> .....	
1 Wryneck .....	<i>Yunx torquilla</i> .....	
1 Wanderoo Monkey.....	<i>Silenus veter</i> .....	
1 Lory .....	<i>Lorius garrulus</i> .....	
2 Lesser Weaver Birds .....	<i>Hyphantornis</i> .....	
3 Virginian Nightingales ...	<i>Cardinalis virginiana</i> .....	
3 Turquoise Parrakeets ...	<i>Psephotus pulchellus</i> .....	
1 Wheatear .....	<i>Saxicola oenanthe</i> .....	
1 Nuthatch.....	<i>Sitta cæsia</i> .....	

Of these, *Balæniceps rex* was stated to be exhibited for the first time.

May 8, 1860.

E. W. H. Holdsworth, Esq., F.L.S., in the Chair.

The following papers were read :—

1. ON AN APPARENTLY NEW SPECIES OF PARADISE-BIRD.  
By WILLIAM GOODWIN.

I beg permission to introduce to your notice a Bird of Paradise, which I believe to be either altogether unknown, or at least hitherto undescribed.

I have interested myself for many years in this branch of Ornithology, and possess in my own collection twenty-nine specimens, representing all the different species known up to the present time, with the exception of *Semioptera wallacii*. I have had opportunities of inspecting the fine collections of these birds sent to England by that energetic and able naturalist Mr. Wallace, and have searched in vain for any specimen similar to that which I have now the honour of introducing to the meeting. I therefore conclude it to be in all probability an entirely new and undescribed species.

The bird now before you, which I believe to be the female, came into my possession about twenty years ago, together with another, which I have no doubt is the male bird. This latter specimen is now in the British Museum.

I received them both from Mr. Bartlett, and we then agreed in considering them as a young male and female of the *Paradisea papuana*; but the numerous specimens which I have examined in the collections of Mr. Wallace, consisting of males, females, and young of the latter bird, have now convinced me that they belong to an entirely distinct species.

The male (now in the British Museum) is smaller than the *Paradisea papuana*, the length from head to end of tail being about 9 inches, bill  $1\frac{1}{4}$  inch, wings from shoulder to tips barely  $7\frac{1}{2}$  inches, tail  $5\frac{1}{2}$  inches. Feathers on the head and shoulders yellow; back, tail, and wings dark chestnut-brown; the coverts of the wings edged with yellow; the two central tail-feathers have naked shafts 15 inches in length, terminating with elongated webs 3 inches long; the throat has a small patch of golden green, which surrounds the base of the bill; the lower parts, with the exception of a small patch of brown under the throat, white; side feathers somewhat elongated and soft.

Female: length from head to end of tail about 9 inches, bill  $1\frac{1}{4}$  inch. Forehead, throat, sides and top of the head dark chocolate-brown, shading to a dingy yellow and cinnamon colour; tail-coverts tinged with yellowish-brown; tail cinnamon-brown,  $4\frac{5}{8}$  inches long, the two middle feathers narrow, pointed and curved,  $4\frac{1}{2}$  inches in length; the whole of the under parts from the throat white; side feathers soft; *legs and wings imperfect*.

Mr. Bartlett informed me that these birds came to England with other skins of Birds of Paradise, viz. the Clouded (*P. magnifica*), Golden-breasted (*P. aurea*), and the *Ptilorhis magnifica*.

The locality was unknown to him, and is probably one which Mr. Wallace has not yet visited. Should he continue his researches, he may yet be fortunate enough to meet with this species.

In conclusion, I beg to propose that the bird now brought under your notice be named *Paradisea bartlettii*, in recognition of the valuable services rendered by Mr. Bartlett to the lovers of ornithological science by his very careful researches and numerous observations.

## 2. DESCRIPTION OF A NEW SPECIES OF DISTICHOPORA FROM NEW CALEDONIA. BY DR. J. E. GRAY, F.R.S., V.P.Z.S.

(Radiata, Pl. XVII.)

The British Museum has lately received several very fine specimens of a beautiful palmated Coral, belonging to the genus *Distichopora*, from the sea near New Caledonia.

### DISTICHOPORA COCCINEA, sp. nov.

Coral bright crimson, much branched, compressed; branches rather fan-shaped, expanded, placed on each side of the stem; the sides of the branches rather compressed; the main branches with a





C.H. Ford.

W. West imp.

*Distichopora coccinea*: Gray



subcentral series of small compressed tubercles, like the commencement of new branches; lateral pores narrow, cells small.

*Var.* The upper surface of the stem with many short furcate branches.

*Hab.* Pacific Ocean, near New Caledonia, in deep water.

This species differs from the only other recent species of the genus known, viz. *D. violacea*, not only in the beautiful bright crimson colour, but also in the form of the stem and branches, which in this coral is much more compressed, broader, and with shelving edges, giving it a rather sword-like appearance. The lateral grooves containing the cells are much narrower, and the polypiferous cells much smaller. In one specimen the small oblong compressed tubercles on the middle of the upper side of the branches are produced into simple, forked, or sometimes more subdivided short branches. The apices of the branches, which have been broken and reproduced, are whitish.

The surface of many of the branchlets, as in *D. violacea*, is more or less covered with more or less crowded, convex, circular elevations or slight tubercles, which appear to be hollow and blister-like, with rather thick parietes.

### 3. LIST OF MAMMALIA COLLECTED BY MR. J. MONTEIRO IN ANGOLA. BY PHILIP LUTLEY SCLATER, M.A., SECRETARY TO THE SOCIETY.

As so little is known of the Mammals of Angola, I have thought that it might be worth while to record the names of a few species observed or collected there by Mr. J. Monteiro during his recent residence at Bembe. Most of the specimens are flat (furriers') skins from the interior. They were obtained from the caravans that brought down ivory, and belong to animals which are natives of a district lying about 300 miles from the coast.

#### 1. COLOBUS ANGOLENSIS, sp. nov.

*Ater: humerorum utrinque pilis elongatis et caudæ apice albis.*  
Long. tota 24·0, caudæ 24·0 poll.

This *Colobus* is readily distinguishable from other West-African species by its black tail having only a white termination. *Colobus guereza* of Eastern Africa has a somewhat similar tail; but the white extends all along the body, over the face, &c. The single skin sent is very imperfect, wanting the feet and face, but still affords sufficient indication of the distinctness of the species.

Wagner, in his 'Supplement to Schreber's Säugethiere' (vol. v. p. 36), Pel in the 'Bijdragen tot de Dierkunde' of Amsterdam (vol. i. p. 7), and other writers have, I think, rather hastily reduced the species of Black and White *Colobi*; of which there appear to be at least five, recognizable as follows:—

#### (1.) COLOBUS URSINUS.

*Colobus ursinus*, Ogilby, P. Z. S. 1835, p. 98; Fraser, Zool. Typ. pl. 1.

*Ater: facie, mystacibus, et cauda tota albis.*

*Hab.* In Afr. occident., Sierra Leone.

Mr. Ogilby's type-specimen of this species is now in the British Museum. It is probably the same as *Colobus polycomos* (founded on Pennant's Full-bottom Monkey), but it appears decidedly distinct from the next following.

(2.) **COLOBUS VELLEROSUS.**

*Semnopithecus vellerosus*, Is. Geoffr. St.-Hil. Voy. de Bélanger, Zool. (1830).

*Semnopithecus bicolor*, Wesmael, Bull. Acad. Brux. ii. p. 237.

*Colobus leucomeros*, Ogilby, P. Z. S. 1837, p. 69.

*Colobus vellerosus*, Is. Geoffr. St.-Hil. Cat. des Mamm. p. 17.

*Ater: fascia frontali, facie, barba, mystacibus, natibus et cauda longissima albis.*

*Hab.* In Afr. occident., Gold-coast.

*Mus.* Brit.

Easily distinguishable from the former species by the distinct white frontal band, and the white thighs and buttocks. Two fine and perfect examples are in the Gallery of the British Museum.

(3.) **COLOBUS ANGOLENSIS.**

*Ater: humerorum utrinque pilis elongatis et cauda apice albis.*

*Hab.* In Angola.

(4.) **COLOBUS GUEREZA.**

*Colobus guereza*, Rüpp. Neue Wirbelth. p. 1. pl. 1.

*Ater: fascia circa faciem, gutture, prynnae laterumque pilis longissimis, caudaque apicem versus albis.*

*Hab.* In Afr. orient., Abyssinia.

*Mus.* Brit.

(5.) **COLOBUS SATANAS.**

*Totus ater.*

*Hab.* In ins. Fernando Po.

*Mus.* Brit.

2. **CERCOPITHECUS MELANOGENYS**, Gray, P. Z. S. 1849, p. 7. pl. 9. f. 1.

A flat skin of this species, which, as Mr. Monteiro informs us, is very abundant at Encôge, two days' journey to the south of Bembe (see Mr. Monteiro's note, *antea*, p. 112).

3. **FELIS NEGLECTA**, Gray, Ann. N. H. i. p. 27.

A flat skin, agreeing with Dr. Gray's type-specimen, which is also a flat skin, in the British Museum.

4. **FELIS SERVALINA**, Ogilby, P. Z. S. 1839, p. 94.

A flat skin, agreeing with Mr. Ogilby's type-specimen, which is also a flat skin, now in the British Museum.

5. *NANDINIA BINOTATA* (Reinw.).

A flat skin.

6. *GENETTA ABYSSINICA*, Rüpp. Neue Wirbelth. p. 35. pl. 11.

An example of this species was obtained alive and brought to England by Mr. Monteiro.

7. *GENETTA* — ?

Flat skins of a second species, apparently a true *Genetta*, for which I am unable to find a name.

8. *MUS RATTUS*, Linn.

The Common Black Rat of Europe is, as Mr. Monteiro informs me, very abundant in the coast region of Angola.

9. *MANIS TRICUSPIS*, Sund.

*Manis multi-scutata*, Gray; Fraser, Zool. Typ. pl. 28.

Mr. Monteiro has furnished me with the following note on this *Manis*:—

“Abundant around Bembe (130 miles inland, West Coast of Africa, lat. 7° 22' S.). Said by the natives, to whom it is well known there as well as on the coast, to cause considerable damage to the plantations, by grubbing up the *Mandioca* roots, ground-nuts, &c., very likely when in search of the ants and larvæ said to constitute its food. The roots would very easily be exposed by this animal in the search for its food, as they are planted in hillocks of loose earth thrown up on the surface of the ground.

“The animal from which this skin was obtained was kept alive in a tub, and fed on ants and larvæ, for a fortnight, when it died, and the skin was sent to me.

“Its death was very probably due to its having been injured by the negroes that captured it,—these having great fear of all animals and reptiles, and their first impulse being to give everything alive they may see a crack on the head with a stick.

“I have often seen the skins in the negro huts, as also in Loanda on the coast, the scales being esteemed by the natives as a ‘fetish’ or charm.”

## 4. NOTES ON TWO STRUTHIOUS BIRDS NOW LIVING IN THE SOCIETY'S GARDENS. BY PHILIP LUTLEY SCLATER, M.A., SECRETARY TO THE SOCIETY.

At the last meeting of this Society I announced that we were expecting to receive two additional examples of Struthious birds for the Menagerie, which I had reason to believe would prove to be distinct from any of the seven then existing in it. I now have the pleasure of informing the meeting that these birds have arrived in

good health and condition, and that an accurate examination of them has convinced me, as well, I believe, as every one who has paid them a visit, that they really belong to independent species. We are now therefore the fortunate possessors of no less than nine different species of this important group, of which, until lately, but four were known to exist in the whole world in a recent state.

The newly arrived birds I allude to are examples of the Emeu of Western Australia (*Dromæus irroratus*, Bartlett), and the Cassowary with the throat-wattles divided and far apart, which I have proposed to designate *Casuarius bicarunculatus*.

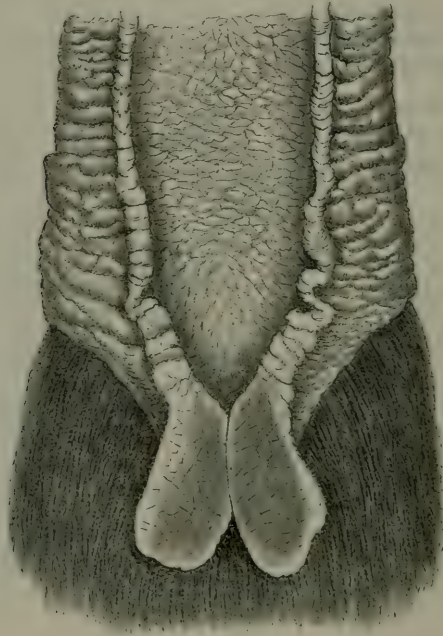


Fig. a.

The Emeu of Western Australia may, as was pointed out by Mr. Bartlett, when he first described it at a meeting of this Society in May 1859\*, be easily distinguished from the well-known Eastern bird by its spotted plumage. On comparing the feathers of the two species together, the mode in which this spotting is produced is clearly apparent. The feathers of *D. irroratus* are barred alternately with silky white and darkish grey throughout their length, terminating in a black tip margined posteriorly with rufous. Those of *D. nove*

\* See P.Z.S. 1859, p. 205.

*hollandiæ* are uniform blackish-grey from the base to the extremity, which is black with a broad subterminal band of rufous. On comparing the two living birds together, we find *D. irroratus* generally of a much more slender habit. The tarsi are longer and thinner, and the toes longer and much more slender. The tarsal scutes are smaller. The irides are of a pale hazel, instead of a reddish brown as in *D. novæ hollandiæ*.

The example of *D. irroratus* in the Gardens of the Zoological Society of Amsterdam was brought by a Dutch vessel from Albany, King George's Sound. I have reason to believe that our specimen



Fig. b.

is from the same locality. As Mr. Bartlett's original skin of *D. irroratus* was obtained in the interior of Southern Australia, the range of this Emeu must be supposed to extend over the western portion of Australia into the latter colony, where it probably inosculates with *D. novæ hollandiæ*\*.

With regard to the *Casuaris bicarunculatus*, I am unable at pre-

\* Two additional specimens of the Spotted Emeu (both immature) have since been received by the Society from Swan River. In this stage of plumage the bird is decidedly darker than its near ally, *D. novæ hollandiæ*.

sent to give any particulars concerning its true *habitat*, though in all probability it is the representative of the Common Cassowary of Ceram (*Casuarus galeatus*) in one of the Molucca group or adjoining islands. The specimen which we possess is still quite young. The casque is not developed. Except as regards the complete separation of the two neck-wattles, as indicated in the drawings now exhibited (woodcuts *a* and *b*, p. 248-9), where fig. *a* represents the front view of the fore-neck of the Common Cassowary, and fig. *b* the corresponding part of the new species, this bird might well pass as a rather bright-coloured variety of the *Casuarus galeatus*. But I have little doubt that the bird, as it grows older, will develop further differences, and that, when adult, it will be readily distinguishable by other characters from the common species.

5. NOTES ON A COLLECTION OF BIRDS FROM THE VICINITY OF ORIZABA AND NEIGHBOURING PARTS OF SOUTHERN MEXICO. BY PHILIP LUTLEY SCLATER, M.A., SECRETARY TO THE SOCIETY.

(Aves, Pl. CLXIII.)

M. Aug. Sallé has kindly submitted to my examination a series of birds collected by one of his correspondents principally in the vicinity of Orizaba and the neighbouring parts of the State of Vera Cruz, concerning which I beg leave to offer the following remarks to the Society, in continuation of my former papers on Mexican Ornithology.

1. *TURDUS PINICOLA*, Sclater, P. Z. S. 1859, p. 334.

One example; a male. Since I described this species from M. de Oca's specimens, I have seen an example in the Bremen Museum.

2. *MIMUS* —?

A single skin of a true Mocking-bird seems to indicate the existence of a second species nearly allied to *M. polyglottus* in Vera Cruz. The size is smaller, the colouring above rather paler, and the external rectrix has the outer web black towards the extremity. Before establishing the species, I should wish to see further specimens.

3. *REGULUS SATRAPA*, Licht.

In full plumage.

4. *DENDRÆCA AUDUBONI* (Townsh.).

In complete plumage.

5. *BASILEUTERUS DELATRII*, Bp. Compt. Rend. xxxviii. p. 383; Notes Orn. p. 63.

Nearly allied to *B. rufifrons* (Sw.), which is common in Mexican





COCCOTHAUSTES MACULIPENNIS



collections, but easily distinguishable by the brighter yellow of the under-parts being prolonged over the belly, and the back being olive-green and not brown. The beak of the present bird is also stouter and the tail longer; but the form otherwise agrees with that of *B. rufifrons*.

The New-Granadian bird which I referred to *B. delatirii* in my list of Bogotau birds is clearly a distinct species again, distinguishable by its longer wings and the fuller yellow of the body beneath, which passes into olive on the sides. I now call this *Basileuterus mesochrysus*.

M. Sallé's specimen of *B. delatirii* is labelled 'Uvero: iris brown,' and is the only example I have yet seen of this bird.

#### 6. VIREO FLAVIFRONS (Vieill.).

In fine plumage. Goes as far south as Guatemala. See 'Ibis,' 1859, p. 12.

#### 7. PLECTROPHANES MELANOMUS, Baird, Rep. p. 436.

Two specimens, which, with another Mexican bird in my possession from M. de Saussure's collection, seem to agree with Prof. Baird's characters of *P. melanomus*. This is the extreme southern point that has yet been recorded for a species of this genus.

#### 8. COCCOTHAUSTES MACULIPENNIS, sp. nov. (Pl. CLXIII. fig. 1, ♂; fig. 2, ♀.)

♂. *Flavicanti-olivaceus; pileo alis et cauda nigris, speculo alari et rectricum lateralium macula terminali in pogonio interno albis; secundariis dorso proximis grisescenti-albis: subtus pallide ochraceus, flavicante indutus, crisso albo.*

♀. *Brunnescenti-grisea, pileo brunneo, caudæ tectricibus superioribus albo maculatis: subtus non flavescens.*

Long. tota 6·5, alæ 4·0, caudæ 2·6.

*Hab.* In Mexico merid. orient.

*Mus.* P. L. S. et Brit.

This beautiful Grosbeak forms the third American species of the group. It is easily distinguishable from *C. vespertinus* and *C. abeillii* by its black cap, white wing-bar, and the white markings on the outer tail-feathers. The general structure is that of *C. vespertinus*; the three first remiges are nearly of equal length. The bird described by Prince Bonaparte (Consp. i. p. 505) as the young of *C. vespertinus* was doubtless of this species, and there is a specimen of it in immature plumage in the British Museum.

#### 9. COCCOTHAUSTES VESPERTINUS (Cooper): Baird, Rep. p. 409.

I did not expect to find this Western bird ranging so far southwards.

#### 10. ICTERUS PARISORUM, Bp.

Three examples, all in immature plumage.

11. *ICTERUS ABEILLII*, Less. Rev. Zool. 1839, p. 101.

An excellent species, allied to *Icterus bullockii*, but quite distinct.

12. *MOLOTHRUS PECORIS* (Gm.).

An undoubted specimen of this species.

13. *CYANOCITTA DIADEMATA*, Bp. Consp. p. 377.

Two examples agreeing with Bonaparte's description.

14. *CORVUS CARNIVORUS*, Bartram : Baird, Rep. p. 558.

A true Raven, very much resembling the European bird, which must be referred to *C. carnivorus* as distinguished by Prof. Baird, if that species is really distinct from *C. corax*.

15. *PICOLAPTES LINEATICEPS*, Lafr. Rev. Zool. 1850, p. 277.

I have a second specimen of this bird in my own possession, also from a collection made near Orizaba. M. de Lafresnaye was not acquainted with the true locality of this species, which makes a third Mexican bird of the genus, the others being *P. affinis* and *P. leucogaster*.

16. *THAMNOPHILUS MELANOCRISsus*.

*Thamnophilus melanurus*, mihi, P. Z. S. 1857, p. 203.

A female. This *Thamnophilus*, as I have lately ascertained from examination of Mr. Salvin's Guatemalan specimens, differs from the true *T. melanurus* of New-Granada in having the crissum black, and I therefore propose to call it *T. melanocrissus*.

17. *COTINGA AMABILIS*, Gould, P. Z. S. 1856, p. 64. pl. 123.

One female example, which shows that this *Cotinga* ranges further northwards than has hitherto been supposed.

18. *CERYLE ALCYON* (L.).

Several examples.

19. *MOMOTUS MEXICANUS*, Sw.

Two specimens of this species transmitted are of smaller size than the third, but do not appear otherwise different.

20. *COCYZUS AMERICANUS* (Linn.).21. *COCYZUS ERYTHROPHthalmus* (Wils.).

The collection contains undoubted examples of both of these northern species.

22. *CENTURUS FLAVIVENTRIS*, Sw.

A female of this species, as described by Baird (Report, p. 110).

23. *CHRYSOTIS GUATEMALÆ*, Sclater, Ibis, 1860, p. 44.

A perfect example of this Parrot, as described *l. c.*

24. *SPIZAËTUS TYRANNUS* (Max.).

Good adult specimens of both sexes of this species—the first I have seen from so far north.

25. *BUTEOGALLUS NIGRICOLLIS* (Lath.).

Already noticed as far north as Guatemala (Ibis, 1859, p. 216).

26. *BUTEO ALBONOTATUS*, Kaup, Isis, 1847, p. 399.

Three examples of this bird in various states of plumage.

27. *BUBO VIRGINIANUS* (Gm.).

28. *CRAX GLOBICERA*, Linn.

The Mexican and Central American Curassow appears to be the *Crax globicera*, and not, as I have hitherto considered it, *Crax alector*. In the latter bird the sexes are nearly alike. In the *Crax globicera*, as may be seen from M. Sallé's specimens and from living examples now in the Zoological Society's Gardens, the female is brown.

29. *TINAMUS ROBUSTUS*, sp. nov.

*Tinamus major*, Moore, P.Z.S. 1859, p. 63; Sclater & Salvin, Ibis, 1859, p. 226.

M. Sallé's present series contains two excellent examples of this large Tinamou of Mexico and Central America. As I had anticipated (P. Z. S. 1859, p. 63), it presents differences from *T. major* of Brazil, such as render a new specific name necessary, and I propose shortly to describe it under the above title.

30. *HERODIAS EGRETTE* (Gm.).

Already noticed in Guatemala.

31. *DEMEGRETTE LUDOVICIANA* (Wils.): Baird, Rep. p. 663.

One immature specimen.

32. *FLORIDA CÆRULEA* (Linn.).

33. *TIGRISOMA TIGRINUM* (Gm.).

34. *NYCTICORAX VIOLACEUS* (Gm.).

35. *TANTALUS LOCULATOR*, Linn.

36. *TRINGA WILSONI*, Nuttall.

37. *SYMPHEMIA SEMIPALMATA* (Gm.): Baird, Rep. p. 729.

38. *ACTITURUS BARTRAMIUS* (Wils.).

39. *GAMBETTA MELANOLEUCA* (Gm.).

40. TRINGOIDES MACULARIUS (Linn.).  
 41. RHYACOPHILUS SOLITARIUS (Wils.).  
 42. ERISMATURA DOMINICA (Linn.).  
 43. QUERQUEDULA CAROLINENSIS (Gm.).  
 44. QUERQUEDULA DISCORS (Linn.).
6. ON THE STRUCTURE, RELATIVE SIZE, AND USE OF THE TAIL-GLANDS IN BIRDS. BY EDWARDS CRISP, M.D., F.Z.S., ETC.

It is strange that all (as far as I know) who have written upon these glands speak of one gland only; but, as I shall show hereafter, there are two distinct glands, from each of which proceeds a duct or canal for the conveyance of the matter secreted; and it would not be more incorrect to speak of the lungs or of the kidneys of a bird in the singular number than to describe the oil-glands as one gland.

As the heading of my paper states, my first endeavour will be to describe the structure of these glands, and then I shall pass on to consider their use.

The only English writers that I am acquainted with who have written generally upon the anatomy of birds are Professor Owen (article "Aves" in the 'Cyclopædia of Anatomy and Physiology') and Mr. Macgillivray in his 'History of British Birds, their Organization, Habits, &c.'

The first-named writer speaks of these glands, or rather of *the* gland, as follows:—

"The unctuous fluid with which birds lubricate their feathers is secreted by a gland, which is situated above the coccyx or uropygium. This gland consists of two lateral moieties conjoined; as might be expected, it is largest in the birds which frequent the water. In the Swan it is  $1\frac{1}{2}$  inch in length, and has a central cavity which serves as a receptacle for the accumulated secretion; but this cavity has not been observed in other species. Each lateral portion is of a pyriform shape, and they are conjoined at the apices, which are directed backwards, and are perforated by numerous orifices. The longitudinal central cavities also present internally numerous angular openings in which there are still smaller orifices. The surrounding glandular substance consists of close-set, almost parallel, straight tubes, and is not irregularly cellular. The tubercles extend to the superficies of the gland without ramifying or intercommunicating, and preserve an equable diameter to their blind extremities. The tubercles are longest at the thickest part of the gland, and become shorter and shorter towards the apex."

It will be seen presently that my description of these glands differs materially from that given by Professor Owen.

Mr. Macgillivray, in the work alluded to (vol. i. p. 44), says,—  
 "These feathers have their basis supported by the last coccygeal

bone, and firmly bound together by a strong ligamentous band composed of interlaced fibres. On its upper surface rests the uropygial gland, celebrated by the field- and closet-naturalists, being one of the few points of the structure of a bird accessible to them, and containing a quantity of oily matter mixed with an aqueous fluid, while on its lower surface is a layer of cellular tissue containing a similar substance. Both are apparently destined for nourishing the feathers, or at least are connected with their growth. I have observed that at the period of moulting, and especially when the tail-quills are growing, they are very highly developed, and, as is well known, sometimes inflame and suppurate in domestic birds; whereas in birds in which the moult has been completed, I have generally found them greatly diminished, and frequently entirely shrunk. This fact, analogous to that of the periodical enlargement of the testicles in birds, affords a key to the knowledge of the nature and use of the uropygial gland which has hitherto eluded the sagacity of physiologists; for the application of the oil contained in it by the bill is certainly fanciful."

I must express my surprise that such an accurate observer as the late Mr. Macgillivray should have confounded these glands with the cushion of fat in which the ends of the tail-feathers are imbedded: there is no resemblance in the structure of these bodies, and the use of the microscope would have decided the point at once.

I have not observed that the tail-glands are larger at the time of moulting, although it is not unlikely, in consequence of a greater quantity of blood being distributed to the roots of the tail-feathers, that there may be a slight increase of bulk at this period, more especially on the fatty portion of the tail.

Montagu, Fleming, Bewick, Jenyns, Yarrell, and other writers on British Birds, I believe, do not mention these glands. I have not had time to consult foreign authors, but I assume that if any of these had described two glands, the circumstance would have been mentioned by some English writers.

It may be well to speak of the caudal appendage, or rather of its motor apparatus, before I proceed to the anatomical description of these organs. The tail of most birds, as is well known, is very moveable, and consequently requires powerful muscles to effect this mobility. In the Peacock, and other gallinaceous birds with large tails, the rump-muscles are much developed, whilst in birds with small tails they are generally much diminished in size. The tail of a bird can be depressed, elevated, moved in a lateral direction, or the feathers can be spread out or contracted at the will of the animal. I need not describe *minutely* the origin and insertion of these muscles; it will be sufficient to indicate their general bearing. The elevator muscle (*levator coccygis*)—a strong, powerful muscle in many birds—arises from the sacrum, from the bodies and sides of the coccygeal vertebræ, and is inserted into the spinous processes of these vertebræ, and into the base and spinous process of the last vertebra. These muscles not only raise the tail, but when one acts, it moves it laterally.

The antagonist to this muscle is the depressor of the tail (*depressor*

*coccygis*), arising chiefly from the inferior and posterior part of the pelvis, from the bodies of the coccygeal vertebræ, and inserted into their inferior spinous processes, and into the base of the last vertebra. The action of this muscle, single and double, is the reverse of the last-named. The *quadratus coccygis* arises from the lateral portions of the coccygeal vertebræ, and passes in a somewhat curved direction over the fatty prominence of the base of the tail, and is inserted into the fascia below the tail, and into that enveloping the base of the tail-quills; it serves to spread and partly to raise the tail-quills.

The *ischio-coccygeus* arises from the ischium and lateral parts of the anterior coccygeal vertebra, and is inserted into the last vertebra and into the tail-fascia. It lowers the tail and moves it laterally.

The *pubi-coccygeus*, on the under surface of the tail, arises from the posterior parts of the pubis and ischium, and is inserted into the fascia of the quills. It acts by spreading the quills and by moving the tail laterally.

I have followed nearly the description of these muscles as given by Mr. Macgillivray, Professor Owen, and others. I could make many variations in the account when speaking of them in different birds, but this digression would be foreign to the object of my paper. I must, however, allude to two omissions made by these authors, which are important, I think, in relation to the function of the organs.

In many birds a portion of the elevators of the tail is inserted into the base of the glands, so that when these muscles contract, they favour the escape of the secretion. But in other birds, the Moor Hen for example, a distinct pair of muscles is spread upon the posterior and inner portions of the glands, which they serve to compress, and thus assist in the ejection of their contents; they also help to elevate the tail.

I refrain from naming these muscles at present, as a long series of dissections will be required before the matter can be properly determined, and the variations of these muscles accurately described.

The above account may by some be thought unnecessarily prolix; but I believe these muscles have an important bearing upon the use of the glands in question, serving by their action greatly to facilitate the passage of the oleaginous secretion.

*Form of the tail-glands.*—These glands are of a rounded, oblong, flask-like shape, and would be well represented by the junction of two Florence flasks at their necks, their bases being somewhat widely separated. In all the figures now exhibited of the six orders of birds, as will be seen, there is a general resemblance in their form. In some of the smaller passerine birds, however, they are more rounded than in the larger species.

*Situation.*—In the great majority of birds which I have dissected, these glands have been found upon the *levatores coccygis*, having the *quadrato-coccygei* and *pubi-coccygei* on the outer side, the posterior part of the spine of the last caudal vertebra, and the same part of the two or three anterior to this, between them. In some birds, in the



*Palmipedes* especially, where they are of larger size, they extend more forwards; and in many of the Accipitrine birds they are placed more upon the fatty prominence which supports the quill-feathers. In the *Scolopacidæ* and *Columbidæ* they are seated between the two central tail-feathers.

*Structure.*—Externally the gland is covered with a fibrous capsule, which is extremely vascular. I have failed at present to inject the interior of the glandular structure, nor have I succeeded in tracing nerves into it. In many birds, however, when examined soon after death, the blood-vessels may be seen running in parallel lines with the tubules, and ramifying upon them. The glands are generally thinly covered with short supple feathers of a downy character, and their flask-like necks are usually surmounted by a tuft of short soft feathers, varying greatly in number in the different orders, but more abundant in the swimming birds. In the *Pelicanidæ* these tufts are very large, and will hold a great quantity of oil. In other birds, as in the *Columbidæ*, the ducts are quite bare of feathers.

In the centre of each nipple, which is generally encircled by feathers, is a round, smooth, single orifice, through which a probe can be readily introduced, and through which aperture the fluid contents of the glands, especially in the living birds, can easily be squeezed out. The two glands are closely united at their posterior part by dense fibrous tissue. The internal portion of the gland consists of elongated cylindrical glandules or tubules, as described by Prof. Owen, which supply the secretion. They pass generally from before backwards, taking an oblique longitudinal direction, and they terminate in rounded extremities, having, I think, a small central aperture; but of this I speak with some amount of hesitation. These tubules resemble somewhat the proventricular glandules. In some diseased glands the contents of the tubules are readily seen under a low power, and if immersed for some time in æther, and then dried, they are more distinctly visible. They all terminate in what may be called the cavity of the gland, a small space varying in size in different birds, and generally partly filled with the fatty or oleaginous secretion, but sometimes found quite empty. In some birds this portion of the gland is interlaced with a network of fibrous tissue, in which the secretion is partly lodged.

In young birds, as shown by the Thrushes on the table, the glands are small, semitransparent, gelatinous, and very vascular under a low power, and an abundant network of vessels is seen to ramify on the surface; the brush or tuft is indicated by a minute black speck, as are also the duct-orifices. I think I have found the glands larger and more perfect at birth in feathered birds, as in the Duck and Plover; but my observations are not sufficiently numerous to enable me to speak with certainty on this point.

*Nature of the secretion.*—It varies much in consistence, sometimes being thick and pap-like, and at other times clear like pure oil. It leaves a greasy stain upon blotting-paper, burns after a time with a brisk flame, dissolves readily in æther, and forms an oily, soapy compound with potash. Under the microscope it presents various

appearances, depending much upon the consistence of the matter; when solid, cholesterine plates are often seen in it; and when fluid, it has much the appearance of animal oil.

*Relative size.*—I have in numerous instances weighed the bird and the gland at the same time, but I will select only a few examples from the tables. The birds were in tolerable condition, and many of them in a wild state; the word *about* must be used to all, as I have not included grains in weighing large birds for this purpose. The relative proportion of the glands to the body was as follows in the subjoined list:—

Peregrine Falcon. <i>Falco peregrinus</i> .....	1-2886
Kestrel. <i>F. tinnunculus</i> .....	1-1980
Long-eared Owl. <i>Strix otus</i> .....	1-1840
Hooded Crow. <i>Corvus cornix</i> .....	1-788
Starling. <i>Sturnus vulgaris</i> .....	1-700
Water-Ousel. <i>Cinclus aquaticus</i> .....	1-560
Green Woodpecker. <i>Picus viridis</i> .....	1-1026
Grey Parrot. <i>Psittacus erythacus</i> .....	1-3420
Grey Partridge. <i>Perdix cinerea</i> .....	1-1401
Red-legged Partridge. <i>P. rufa</i> .....	1-1241
Common Pheasant. <i>Phasianus colchicus</i> .....	1-2100
Sand Grouse. <i>Pterocles arenarius</i> .....	1-3080
Wood Pigeon. <i>Columba palumbus</i> .....	1-6040
Domestic Pigeon. <i>C. livia</i> .....	1-4850
Bronze-winged Pigeon. <i>C. chalybeata</i> .....	1-3066
Crested Pigeon (Australia). <i>Ocyphaps lophotes</i> .....	1-5504
Land Rail. <i>Gallinula crex</i> .....	1-876
Oyster-catcher. <i>Hematopus ostralegus</i> .....	1-2343
Ruff. <i>Tringa pugnax</i> .....	1-1960
Black-tailed Godwit. <i>Limosa lapponica</i> .....	1-2053
Whimbrel. <i>Numenius phaeopus</i> .....	1-1750
Curlew. <i>N. arquata</i> .....	1-1608
Crested Crane. <i>Grus pavonina</i> .....	1-2112
Black Swan. <i>Cygnus atratus</i> .....	1-792
Tame Duck. <i>Anas boschas</i> .....	1-311
Muscovy Duck. <i>Cairina moschata</i> .....	1-296
Pin-tail Duck. <i>Anas acuta</i> .....	1-526
Shoveller. <i>A. clypeata</i> .....	1-438
Teal. <i>A. crecca</i> .....	1-555
Common Gull. <i>Larus canus</i> .....	1-364
Herring Gull. <i>L. fuscus</i> .....	1-563

#### Young Birds.

Coot. <i>Fulica atra</i> (half-grown) .....	1-245
Rook. <i>Corvus frugilegus</i> .....	1-2346
Thrush. <i>Turdus musicus</i> (a few days old) ....	1-1320

*Use.*—I scarcely need tell the members of the Society, that, even at the present time, much difference of opinion exists respecting the

use of these glands, probably the greater number of physiologists and ornithologists believing that the organs, as the name implies, are for the purpose of secreting an oleaginous fluid, with which the bird lubricates its feathers. Many, on the contrary, are of opinion that these glands do not serve for such a purpose, among the latter may be included many practical ornithologists; I need only mention the name of Mr. Waterton, and it was in consequence of reading the following extract from his 'Essays on Natural History,' 1844, p. 130, that my attention was specially directed to the subject; and during the last few years I have weighed these glands, and taken drawings of them in many birds, British and foreign, that I have dissected.

Mr. Waterton, among the reasons he gives for his belief that the glands in question are not used for the purpose of lubricating the feathers, says, in the work above referred to, "Again the oil-gland in most water-fowls is covered with a thick tuft of down, not moveable at pleasure; this tuft would prove an insurmountable obstacle to the transfer of matter from the gland through the medium of the bill. If for the purpose of lubricating the feathers, it would not have been granted by the Creator to one bird, and denied to another." Mr. Waterton goes on to mention a Kestrel struck down by lightning, in which the orifice of the gland was covered with a tuft of down, which had the exact appearance of a camel-hair brush, which would effectually impede the transfer of oil from the gland to the bill.

As I shall not have space to quote other authorities, I may as well answer Mr. Waterton at once. As regards the absence of the glands, I suspect it is of very rare occurrence. I have never failed to find them, except on one occasion in a young Ostrich, and here they may have escaped my notice. In others of the *Struthionidae* that I have examined I omitted to look for them, my attention not having at that time been directed to the subject. If they are absent in any bird, a ready explanation, I believe, will be afforded by its peculiar habits or locality.

As for any *impediment* offered by the tuft of down to the egress of the oil, it is the most beautiful contrivance to effect this very object that can be imagined; as any one may determine by pressing these glands in any of our poultry, especially in the ducks, when the tuft spoken of becomes saturated with oil, and serves as a kind of sponge, from which the bird with its beak, sometimes with its head, can obtain the fluid. To speak in a plain manner, every bird carries not only a grease-pot in its tail, but most of them have also a brush in addition to this appendage.

But let any visitor to the Society's Gardens watch the Pelicans when they have had their bath; the birds, after soaking their feathers, dry themselves by flapping their wings; during this process the beak is frequently applied to the nipples of the glands, which, in this bird, are so large that they can readily be seen at some distance; the beak is then carried to various parts of the plumage, and the feathers are well-smoothed and oiled. The crown of the head, too, is often placed upon the nipples, and in this manner other parts are

lubricated to a greater extent. The same process may be witnessed in the Ducks and in many other birds. As I have stated before, the coccygeal muscles, I believe, greatly assist in propelling the oleaginous fluid from the ducts. The secretion, judging from the vascularity of the glands and from experiments I have made, is very abundant. During last summer, for the purpose of ascertaining the daily amount of secretion, I confined a duck and a hen in a coop, and for some time every day I squeezed the glands and expressed a large quantity of thick yellow oil, the operation apparently tending to increase the quantity of the secreted fluid.

I infer then that, looking especially to the structure of these glands, the character and quantity of their secretion, their relative size in the Palmipedes especially, they serve for the purpose usually assigned to them, viz. that of supplying an oily fluid for lubricating the skin and feathers.

I have not had time to speak of the morbid states of these glands; but those organs are not unfrequently enlarged in domesticated birds, and the character of the secretion sometimes is much altered. On the table are the tail-glands of the Common Goose, an old bird, in which it will be seen that the cavities are filled with a hard waxy material.

I hope at a future time to bring this matter before the Society, and to compare the structure of these glands with that of the anal glands of the *Viverridæ*.

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May 22nd, 1860.

Dr. J. E. Gray, V.P., in the Chair.

Mr. Selater exhibited a specimen of a new form of Dormouse (*Platacanthomys lasiurus*), lately described by Mr. Blyth\* from the Malabar Coast, and presented to him by the describer.

The following papers were read:—

1. NOTES ON A THIRD COLLECTION OF MAMMALIA MADE BY MR. FRASER IN THE REPUBLIC OF ECUADOR. BY ROBERT F. TOMES.

1. ARCTIBEUS PERSPICILLATUS, Geoff. sp.

2. ARCTIBEUS PUSILLUS, Natt. sp.

*Phyllostoma pusillum*, Natt. Wagn. Weigm. Archiv. 1843, i. 366; Tschud. Faun. Peru. i. 63; Wagn. Supp. Schreb. v. p. 634. pl. 43.

Several specimens of this species appear in the collection, and were,

\* Journ. As. Soc. Beng. vol. xxviii. p. 289.

I believe, collected on the coast of Ecuador, but no indication of their exact locality accompanies them. They are probably the first specimens received in this country, and accord accurately with the figure given by M. Wagner in the fifth volume of his Supplement to Schreiber's work on 'Mammalia.'

### 3. NOCTILIO LEPORINUS, Linn. sp.

Of this species Mr. Fraser has forwarded several specimens, one of which has the following highly interesting note attached:—  
"Esmeraldas, Nov. 1859; skimming the bank of the river, every now and then making a dash along, and actually striking the water, catching the minute shrimps as they pass up stream. He had a very offensive fishy smell."

This is the first recorded instance which I have met with of any species of *Chiroptera* being actually aquatic in its habits. From the great resemblance which exists between the fur of the New Zealand *Mystacina*, and that of the Water Shrews, and indeed that of other mammalia with similar aquatic habits, I had long ago been led to suspect that that Bat might be aquatic in its mode of life, but I could never gather direct evidence on the subject. Certainly I little suspected that this *Noctilio* took its food in the manner noticed by Mr. Fraser.

### 4. EMBALONURA CANINA, Pr. Max. sp.

Three specimens only have come to hand.

### 5. VESPERTILIO ALBESCENS, Geoff.

*V. chiloënsis*, Waterh.

The specimens which I refer to this species differ in a very trifling, though constant manner, from the specimens from which the descriptions of the *V. albescens* of M. Temminck and the *V. chiloënsis* of Mr. Waterhouse have been taken. These are identical, as I have recently ascertained by an examination of the originals.

The chief difference between them and Mr. Fraser's examples consists in the greater length and silkiness of the fur of the latter. At present I do not feel justified in describing them as of a new species.

### 6. FELIS ———?

Resembles in size and proportions (including the shortness of its tail) *Felis tigrina*; but its markings are very like those of *Felis macroura*. The following note by Mr. Fraser informs us that it is young, and this being the case renders its identification very difficult: "Killed on the banks of the Zamora River in January 1858. Young male."

### 7. TAPIRUS AMERICANUS, Gmel.

*T. suillus*, Wagn. Supp. Schreib. iv. 294.

A cranium which is obviously identical with several, labelled *Ta-pirus americanus*, in the British Museum.

## 8. DICOTYLES TORQUATUS, Cuv. Collared Peccary (?).

A skull, with the following note, has been received:—"Esmeraldas, Nov. 1859. *Tatabara*. This is a species of Collared Peccary (*D. torquatus*), having the collar, but is a very different colour in all other parts. It is more a solitary than gregarious animal; when hard pressed, retreats to its den, which is constructed beneath masses of dead vines. Feeds on palm-nuts, and grubs in the earth like a pig." Mr. Fraser then goes on to observe, that in consequence of a strange idea of the natives, that if seasoning were added to the meat, or the latter boiled in a pot with a lid to it, their dogs would become for evermore useless for the hunt, they refused to allow him any part of one of these animals, excepting the skull, after they had done with it.

Mr. Waterton, speaking of the Peccary of Demerara, says, "Three or four hundred of them herd together, and traverse the wilds in all directions in quest of roots and fallen seeds." Mr. Fraser's note would seem to refer to quite a different animal from this.

9. DICOTYLES ALBIROSTRIS, Ill. (?) "White-lipped Peccary."  
—Fraser, MS. Notes.

*D. labiatus*, Schomb. Ann. Nat. Hist. v. 402.

Of this species, obviously distinct from the last, a skull and accompanying note are the only indications. Mr. Fraser says, "White-lipped Peccary; Xivarro name *Und-paqui*,—*und* meaning 'great,' and *paqui* the name of the Collared Peccary, which is found in Gualaquiza."

## 10. TAMANDUA TETRADACTYLA, Linn. sp.

*Myrmecophaga tetradactyla*, Linn. Syst. Nat. xii.

*Tamandua tetradactyla*, Less.

*Myrmecophaga bivittata*, Geoff.

The note which accompanies this beautiful specimen is as follows:—"Esmeraldas, Nov. 1859. *Aso mileró*. Said to subsist on ants, bees, their honey, and other insects, and to live among the branches of trees,—not on the ground. It is eaten by these people, who are a very distinct race from any I have seen elsewhere."

## 11. HESPEROMYS MACULIPES, Pictet?

I am not able to determine this species with certainty, and prefer to leave it undecided for the present, merely noting that it is closely related to the *H. maculipes* of M. Pictet, but nevertheless differs sufficiently from it to excite a suspicion that it may prove to be of a distinct species.

## 12. HESPEROMYS ARVICOLOIDES, Pictet.

Although M. Pictet has himself referred this species to the *H. rengeri* of Mr. Waterhouse, I find M. Wagner subsequently giving

the two as distinct; and after the examination of a large number of specimens undoubtedly referable to *H. renngeri*, and comparison of these with M. Pictet's figure and description, I have arrived at the same conclusion. The species now under notice may be seen in collections with the name of *H. arvicoloides* attached; and, as it accords well with the figure and description of that species (and is certainly distinct from *H. renngeri*), I shall for the present adopt that name.

### 13. HESPEROMYS CALIGINOSUS, n. s.

The present remarkable looking species takes its place under the division of the genus which I have in my former 'Notes' proposed for the reception of two new species forwarded by Mr. Fraser, and which I have called *H. latimanus* and *H. bicolor*. Agreeing with these species in the more essential points of structure, it yet differs from them in the shortness of the tail, and in the kind of fur.

Head and face short, much as in the *Arvicolidæ*; eyes small and concealed in the fur; muffle very small, and without prominences beneath the nostrils; ears small, ovoid, and naked. Fore feet short and moderately broad, with the toes naked, and the claws short and rather stout; hind feet short and moderately broad, with the claws rather strong, and the toes nearly naked on their upper surface, the tarsus even being only sparingly sprinkled with short hairs. Tail about as long as the body, exclusive of the head, sparingly clothed with very short and stout hairs. All the naked parts nearly black, claws pale brown. Whiskers few and short.

The general colour of the fur may be described as black, thickly powdered with darkish chestnut, with a greater mixture of the latter colour beneath than above; on the abdomen slightly tinged with greyish. Each hair is blackish grey at the root, and tipped with chestnut; but there is an unusual number of rather longer black hairs mixed with these, which gives the species the appearance of black, finely dotted with rufous.

The skull of this species has the same conformation as those of *H. latimanus* and *H. bicolor*.

Length of the head and body . . . . .	5	0
——— of the tail . . . . .	3	0
——— of the head . . . . .	1	3
——— of the ears, behind . . . . .	0	5
——— from nose to eye . . . . .	0	6
——— from nose to ear . . . . .	1	0
——— of fore foot and claws . . . . .	0	6
——— of hind foot and claws . . . . .	1	0
Breadth of ear, nearly . . . . .	0	5
——— across the middle of the tarsus . . . .	0	2½
Diameter of the eye . . . . .	0	1

These dimensions, having been taken from a specimen preserved in spirits, are pretty accurate.

14. *HESPEROMYS ALBIGULARIS*, n. s.

Of this well-marked and apparently new species the collection contains two specimens, and one being adult, whilst the other is not more than half-grown, I should be able to give a tolerably good account, but that, both specimens being in skin, the dimensions are less likely to be exact.

The general form is very much like that of *H. longicaudatus*, and it pertains strictly to the same division of the genus (*Calomys*), but is a much larger species, and is differently coloured. The head is moderately elongated, and the snout somewhat pointed. Muffle with two very distinct prominences beneath the nostrils; ears small, roundish, and clothed with short hair externally, and internally near the margin. Fore feet of medium size and proportion, their claws short and rather weak, the thumb furnished with a small but well-developed claw of a rounded form; the upper surface of the toes almost naked. Hind feet long, of moderate breadth; the upper surface of the toes nearly naked, excepting at the root of the claws, which are hidden by a tuft of curved white hairs; upper surface of the tarsus also but very slightly hairy, its under surface quite naked; the claws of medium proportion, and nearly white. The tail, which is longer than the head and body, tapers evenly throughout, is naked, or nearly so, and annulated with very fine scales.

The fur is rather long, soft, and somewhat glossy; on all the upper parts it is dark dusky-grey at the root, tipped with yellowish-brown, and thickly mixed with shining black hairs, which are very numerous on the dorsal region. On the head the fur becomes darker, and yet more so towards the snout, so that from the eyes to the latter it is almost black. Cheeks and sides of the neck yellowish-brown, with a distinct line of division where it meets the darker colour of the head. The chin is ashy-grey. On the throat is a longitudinal well-defined space of pure white (the hairs being white from root to tip), which commences anteriorly very narrow, but, expanding as it passes backward, occupies the whole space between the fore legs, and passes gradually into the colour of the belly, where the fur has the tips only of a greyish-white, which is confined to the mesial line. The hair on the ears is black; a spot of yellowish-brown marks the root of the whiskers; the fur, which extends along the outer surface of the arm to the wrist, is dark grey, and that on the upper surface of the tarsus ashy-grey; the tail is dark grey above, pale brown beneath.

The clear line of separation of the dark colour of the head, from the paler colour of the cheeks, and the white wedge-shaped mark on the throat, equally distinct from the colour of the cheeks, will at once distinguish this species.

A young one half-grown resembles the adults, excepting that the fur is shorter, and the white mark on the throat less pure and not so well defined.

Length of the head and body, about . . . . .	4	9
— of the tail . . . . .	5	6
— of the ears . . . . .	0	5½



Length from nose to eye .....	"	"
----- from nose to ear .....	0	7
----- of the fore foot .....	1	1
----- of the hind foot .....	0	8
	1	3½

The conformation of the skull is in perfect accordance with the external characters, and resembles that of *H. longicaudatus* so exactly, excepting in size, that its dimensions are all that need here be given.

Total length from the front of the nasal bones to the occiput .....	"	"
Length from the front of the nasal bones to the anterior root of the zygoma .....	1	3¼
----- of the nasal bones .....	0	5½
----- from the point of the upper incisor to anterior molar .....	0	5½
----- of the molar range .....	0	4⅓
Breadth behind the posterior root of the zygoma .....	0	3
Length of the lower jaw from point of incisor to condyle .....	0	7
Depth from the coronoid process, vertically .....	0	9½
Length from point of incisor to anterior molar ..	0	4
	0	3⅔

Mr. Fraser's note of the adult specimen is, "Taken *en camino* on my return from Pallatanga." Of the young one, it is added that "many dead ones were lying about, but too much eaten by insects to be of service." The date of both notes is Dec. 1858.

#### 15. *MUS RATTUS*, Linn.

Several specimens of this widely distributed species are included in the present collection, and some of these have their extremities white, *i. e.* the tip of the tail, and part of the toes of all the feet. They do not differ essentially from specimens collected by Mr. Bridges in Chili, and others collected in Mexico by M. Sallé.

#### 16. *LEPUS BRASILIENSIS*, Linn.

One specimen, which Mr. Fraser says is a female, and was with young when obtained, which was in March 1858.

#### 17. *ECHIMYS SEMISPINOSUS*, n. s.

In my first notes on Mammals, collected by Mr. Fraser, I included the *Echymys cayennensis*, from the examination of a specimen which had lost the tail, and was otherwise in an unsatisfactory condition. Other and better specimens of *Echymys* having been received, I have been able to make out clearly that they represent a new and well-marked species, and that the former specimen was similar to them.

The general form of this species is robust, more so than either that of *E. cayennensis* or *E. hispidus*. The head is larger in relation to the size of the animal, the ears are much smaller, and the tail not above half the length of the head and body. The head is rather

broad, and the muzzle obtuse, and the muffle large; the ears small, and with their lobular part much less developed than in *E. cayennensis*, and their ends are more evenly rounded than in that species. The fore feet are strong, and have long and strong claws compared with those of other species. The claw which arms the inner toe or thumb is short and rounded. The hinder limbs are also rather long and strong, with strong claws. All the members are clothed with hair on their upper surfaces, but the fore feet rather scantily on the toes. The spines are confined to the middle of the back, being absent over the shoulders and on the rump, or at any rate so little developed over those parts as not to merit the name of spines. They are short and flexible, their expanded portion being short and near the root, from which they taper regularly, and end in a longish and very fine point, which is black, and resembles the black hairs on the backs of so many of the smaller rodents. The tail tapers evenly to a fine



Fig. 1.



Fig. 2.

Fig. 3.



Fig. 4.



point; the fur of the rump extends on to its base for a space of half an inch, its remaining part being pretty evenly sprinkled with shortish hairs, which are not on any part thick enough to hide the

scales. There is no indication of a tuft at its extremity, as in *E. cayennensis*.

The general colour of the upper parts is very dark brown, being a mixture of reddish-brown and black, the latter predominating; the cheeks, sides of the neck, and sides of the body the same, but paler; around the eyes a narrow circle of black; fore- and hind-feet and under surface of the tail ashy-brown, those on the upper surface of the tail black. There is much less naked skin on the inside of the thighs and on the pubal region in this species than in *E. cayennensis*.

Besides its greater size, the skull of this species offers another peculiarity worthy of note, as may be seen by the drawings (woodcuts 1, 2, 3, 4), which represent the skulls of *E. cayennensis* and *E. semispinosus*. Taking for comparison, as before, the commoner species, *E. cayennensis* (figs. 1, 3), the nasal bones of its cranium are seen to extend backward barely as far as to the anterior root of the zygoma, and to retain their full breadth for the whole of their length, and the intermaxillary bones each to end in a point about one line posterior to this. In *E. semispinosus* (figs. 2, 4) these proportions are reversed: the nasal bones, extending farther back, become narrower, and end in a point on the frontal region, while the intermaxillary bones do not reach so far back as the zygoma, and terminate abruptly instead of being produced to a point. The orbit also in this species is of greater relative size, which is further increased by the backward position of the process of the superior margin of the zygoma.

Length of the head and body .....	9	0"
— of the head .....	2	7
— of the tail .....	5	6
— of the ears behind .....	0	7 $\frac{1}{2}$
Breadth of the ears, nearly .....	0	7
Length from nose to eye .....	1	0
— from nose to ear .....	1	9 $\frac{1}{2}$
— of fore foot and claws .....	1	2
— of the middle claw .....	0	2 $\frac{3}{4}$
— of hind foot and claws .....	1	10
— of the middle claw .....	0	3
— of the fore arm .....	1	6
— of the tibia .....	2	2
Total length of skull .....	2	2 $\frac{1}{2}$
Breadth across the zygomatic arches .....	1	1 $\frac{1}{2}$
Length from point of upper incisors to anterior molar .....	0	6 $\frac{1}{2}$
— of molar range .....	0	4 $\frac{1}{4}$
— of nasal bones .....	0	10 $\frac{1}{2}$
— of lower jaw from point of incisors to condyloid process .....	1	4 $\frac{1}{2}$
Depth from the condyle vertically .....	0	7

Three specimens of this species have been received in spirits, all

of which were females; one of them contained two young. I do not find any evidence, excepting this, of the number of young produced at a birth; but if this be the usual number, it would account for the comparative scarcity of the species of *Echimy*s, with the various *Muridæ*, which are usually so abundant.

18. *CÆLOGENYS FULVUS*, F. Cuv.

*C. fulvus*, F. Cuv. Ann. du Mus. x. 206; Pr. Max. Beitr. ii. 454.  
*C. paca* of Waterhouse's 'History of Mammalia.'

Although this is not admitted as a good species, distinct from *C. paca*, I have chosen to insert it under the above name, the better to identify it—whether a species or mere variety—with that part of South America from which it was received, as I do not meet with any notice of the occurrence of the commoner species, *C. paca*, in Ecuador. It was taken at Zamora in January 1858, and was brought to Mr. Fraser by the Indians, its Xivarro name being *Cushshay*. Mr. Fraser remarks that it was a young male, and that its flesh was white and delicate.

19. *DIDELPHYS AZARÆ*, Temm. Mon. i. 30.

*D. aurita*, Pr. Max. Beitr. ii. 392.

One specimen. It was taken at Cuenca in October 1857. Mr. Fraser states that it was killed in a nunnery, and proved to be a female, that it is accused of destroying "fowls, fruit, and grain," lives in the roofs of houses, and is nocturnal in its habits.

20. *DIDELPHYS CANCRIVORA*, Gmel. Linn. Syst. Nat. i. 108; Temm. Mon. i. 32 (?).

But one specimen also of this Opossum has been received, and this I refer with some doubt to the above species. It resembles the specimens in the British Museum in all respects, save in being larger and in having shorter fur. A skull of *D. cancrivora*, which formed part of the Museum of the Zoological Society, and which, from the worn condition of the teeth, obviously belonged to an adult animal, is considerably smaller than that of the present specimen, but is otherwise similar.

21. *DIDELPHYS ORNATA*, Tschud. Faun. Peru. pl. 7. p. 146.

From the great similarity in the colouring and quality of the fur, Mr. Waterhouse regards this species as identical with his earlier described *D. derbyana*, notwithstanding that they are considerably unlike in point of size. The specimen collected by Mr. Fraser accords well with Dr. Tschudi's description in this respect, saving that the ears are evidently smaller. This general accordance with *D. ornata* has induced me to regard the latter as distinct from *D. derbyana*. It is probable that we have several species of these Woolly Opossums, which are at present more or less confounded with each other.

## 2. SYNOPSIS OF THE SPECIES OF THE GENUS PENELOPE.

BY G. R. GRAY, F.Z.S., ETC.

## 1. PENELOPE CRISTATA.

*Nigra aut ferrugineo-brunnea; collo, pectore et corporis lateribus albo-limbatis; tectricibus alarum nitore virescentibus et violaceis; remigibus subpurpurascens; dorso, uropygio, femoribus et abdominis parte inferiore ferrugineo-nigris; dorso uropygioque æneo lavatis; cauda obscure nigra (ex. Edw.).*

*Meleagris cristata*, Linn. S. N. i. p. 269; Edw. Birds, pl. 13.

*Penelope purpurascens*, Gray, Knowsl. Menag. pl. ?

*Hab.* West Indies (?) (Edw.).

## 2. P. MARAIL.

B.M.

*Juv. Uropygio, notæi parte reliqua, collo ac pectore æneo-nigris; plumis cervicis, dorsi supremi ac pectoris albo-limbatis; abdomine fusco et tectricibus rufescenti-fuscis nigro conspersis; plumis aurium cano-marginatis (Wagl.).*

*Penelope marail*, Gmel. S. N. i. p. 734, juv.; Wagl. Isis, 1830, p. 1110; Pl. Enl. 338, juv.

*Salpiza marail*, Wagl. Isis, 1832, p. 1226.

*Penelope jacupema*, Merr. Beytr. t. 11, adult?

Long. 24".

*Adult. Nigrescenti-ænea, viridi nitens; uropygio, femoribus, abdomine tectricibusque subcaudalibus nigrescenti-æneis, viridi nitentibus; primariis pallide rufescenti-brunneis.*

*Hab.* Guiana; Cayenne.

## 3. P. PURPURASCENS.

B.M.

*Fuliginoso-olivacea, purpurino-splendens, gastræi plumis, dorsi supremi, ac tectricibus minoribus albo-limbatis; uropygio ac crisso sericeo-purpurino-castaneis (Wagl.).*

*Penelope purpurascens*, Wagl. Isis, 1830, p. 1110.

*Salpiza purpurascens*, Wagl. Isis, 1832, p. 1226.

Long. 31 $\frac{1}{2}$ ", cauda 15" 7 $\frac{1}{2}$ ".

*Hab.* Mexico.

## 4. P. NIGRICAPILLA.

B.M.

*Virescenti-ænea; collo, pectore, dorsi supremi tectricibusque minoribus albo-limbatis; uropygio, abdomine tectricibusque subcaudalibus æneo-fuscis; illis rufo-conspersis; capite colloque superiore nigrescentibus; plumis pilei cano-limbatis.*

Long. 28".

*Hab.* Brazil.

## 5. P. LICHTENSTEINII.

B.M.

*Nitide olivaceo-ænea; crista nuchaque brunneo-æneis, plumis*

*frontalibus albo-limbatis; superciliis ad latera partis denudatæ juguli extendentibus, et plumis auricularibus ad basin mandibuli inferioris, cinereo-albis; jugulo, pectore, nucha, dorsi parte superiore tectricibusque albo late marginatis; dorsi parte inferiore, uropygio et tectricibus supra-caudalibus brunneo-æneis, nigro reticulatis; abdomine, femoribus tectricibusque subcaudalibus brunneo-æneis fusco irregulariter fasciatis; cauda brunneo-ænea, plumis lateralibus purpurascenti-nigris, rufo-brunneo terminatis.*

*Penelope montana*, Licht.?, Pr. B. Compt. Rend. 1856, p. 877.

Long. 25", caudæ 11".

Hab. Venezuela.

6. P. SCLATERI.

B.M.

*Olivaceo-ænea; crista nigrescenti-ænea, cinereo-albo late limbata; superciliis ad latera partis denudatæ juguli extendentibus et tectricibus auricularibus cinereo-albo terminatis et late marginatis; pectore, lateribus, dorsi parte superiore alarumque tectricibus cinereo anguste limbatis; dorsi parte inferiore, uropygio tectricibusque supra-caudalibus rufo-castaneo-æneis; abdomine lateribusque rufo-æneis; abdominis parte inferiore femoribus tectricibusque subcaudalibus rufo-castaneis; cauda viridi-ænea.*

Long. 24½", caudæ 10¾".

Hab. Bolivia.

7. P. BRIDGESI.

B.M.

*Brunneo-ænea; plumis frontalibus albo-limbatis; pectore, lateribus, dorsi parte superiore alarumque tectricibus albo-limbatis; remigibus cinereo submarginatis; uropygio tectricibusque supra-caudalibus purpureo-æneis; corpore infra brunneo-æneo, rufo nigroque reticulato; cauda purpureo-ænea, brunneo-rufo marginata nigroque delicatule reticulata.*

Long. 29", caudæ 14".

Hab. Bolivia.

8. P. PILEATA.

B.M.

*Pilei plumis diffractis, albis, occipitis versus apicem isabellinis; pilei vitta laterali nigro-pilosa; collo ac gastræo castaneo-rubris, ex parte albo-limbatis; crista nigricante; dorsi plumis æneo-nigris albo-marginatis; remigibus caudaque æneo-nigris; pedibus flavis (Wagl.).*

*Penelope pileata*, (Licht., Wagl. Isis, 1830, p. 1110.

*Salpiza pileata*, Wagl. Isis, 1832, p. 1226; Gray, Knowsl. Me-nag. pl. ; Des Murs, Iconogr. Ornith. t. 23.

Long. 29", caudæ 13¼".

Hab. Para.

9. P. JACUACA.

B.M.

*Virescenti-ænea, nitens; pilei plumis virescenti-fuscis; nucha,*

pectore, corporis lateribus alarumque tectricibus albo-limbatis; uropygio, tectricibus supra- et sub-caudalibus abdomineque ferrugineo-rufis; cauda supra rufo virescentique ænea, subtus violaceo-nigra.

Juv. Pectoris parte inferiore, abdomine femoribusque ferrugineo-brunneis nigro-reticulatis; pilei plumis griseo-limbatis; uropygio tectricibusque supracaudalibus ferrugineo-æneis.

*Penelope cristata*, Lath. Ind. Orn. ii. p. 619; Wagl. Isis, 1830, p. 1110.

*Penelope jacuaca*, Spix, Av. Bras. t. 68 (juv.).

*Penelope brasiliensis*, Pr. B. Compt. Rend. 1856, p. 877.

*Salpiza cristata*, Wagl. Isis, 1832, p. 1226.

Long. 30", caudæ 13".

Hab. Brazil.

#### 10. P. OBSCURA.

Pileo ac collo postico nigris; tectricibus ac plumis dorsi supremi nigricantibus necnon pectoris carmelitino-fuscis, albo-limbatis; tergo, ventre, tibiisque castaneis; [cauda nigra] (Wagl.).

*Penelope obscura*, Vieill. N. Diet. 36. p. 343.

*Salpiza obscura*, Wagl. Isis, 1832, p. 1226.

Long. 28", caudæ 11".

Hab. Paraguay.

#### 11. P. BOLIVIANA.

B.M.

Viridi-ænea; plumis capitis, circa partem denudatam colli et aures cinereo-albo-marginatis; collo, dorsi parte superiori, alarum tectricibus, pectore abdominisque parte superiore albo limbatis; alarum tectricibus majoribus remigibusque cinereo submarginatis; uropygio obscure castaneo-æneo; abdomine, femoribus tectricibusque subcaudalibus rufo-castaneis, nigro reticulatis et rufo-albo-limbatis.

*Penelope boliviana*, Reichenb., Pr. B. Compt. Rend. 1856, p. 877.

Long. 31", caudæ 15".

Hab. Bolivia.

#### 12. P. JACUCACA.

B.M.

Fuliginoso-nigricans, æneo-nitens; tectricibus, plumis sincipitis, juguli, pectoris ac epigastrii albo-marginatis; vitta superciliari nivea, inferius atro-marginata; aurium plumis nigris, albo-variolosis (Wagl.).

*Penelope jacucaca*, Spix, Av. Bras. t. 69.

*Penelope jacupeba*, Spix, Av. Bras. t. 71, juv.

*Penelope superciliosa*, Cuv.

*Penelope superciliaris*, Gray, Knowsl. Menag. pl.

*Salpiza jacucaca*, Wagl. Isis, 1832, p. 1226.

Long. 30".

Hab. Bahía.

13. *P. SUPERCILIARIS.*

B.M.

*Aeneo-olivacea*; jugulo pectoreque incanum vergentibus, plumis albo-cinctis; pennis scapularibus, remigibus ultimis tectricibusque magnis rufo-marginatis; vitta superciliari cano-allida; crisso et uropygio fusco-rufis (Wagl.).

*Penelope superciliaris*, Ill. Wagl. Isis, 1839, p. 1110.

*Penelope jacupemba*, Spix, Av. Bras. t. 72.

*Salpiza superciliaris*, Wagl. Isis, 1832, p. 1226.

Av. juv. *Vitta superciliari rufescente, limbo rufo pennarum scapularium ac remigum latiore* (Wagl.).

Long.  $24\frac{1}{2}$ " , caudæ  $11\frac{1}{2}$ " .

Hab. Brazil.

14. *PENELOPE NIGRA.*

B.M.

♂. *Nigra, cyaneo- aut viridi-nitens*; rostro, jugulo, tarsis pedibusque rubris.

♀. *Fusca, viridi-variegata, plumis singulis fasciis plurimis transversis ferrugineis*; plumis subtus pallidioribus et indistincte fasciatis.

*Penelope niger*, Fras. P. Z. S. 1850, p. 246. pl. 29.

*Aburria carunculata*, p. ?, Pr. B. Compt. Rend. 1856, p. 877.

Long. 23" , wings 9" .

Hab. Guatemala.

3. LIST OF BIRDS COLLECTED BY MR. FRASER AT BABAHOYO IN ECUADOR, WITH DESCRIPTIONS OF NEW SPECIES. BY PHILIP LUTLEY SCLATER, M.A., SECRETARY TO THE SOCIETY.

(Aves, Pl. CLXIV.)

Mr. Fraser arrived at Babahoyo from Quito on the 10th of July, 1859. This place is also called *Bodegas*, being the spot where salt is deposited and pays duty. It is situate low on the banks of the river of the same name, about 200 miles N.E. of Guayaquil, and not above 200 or 250 feet above the sea-level. Mr. Fraser remained at Babahoyo during the month of August and part of September, when he left for Esmeraldas, higher up the Pacific Coast.

The number of birds obtained at Babahoyo was 395, belonging to 134 different species, of which I give the names as follows, with extracts from Mr. Fraser's MS. notes which accompanied the collection:—

## I. PASSERES.

1. *TURDUS ALBIVENTRIS*, Spix.

Several ex. of both sexes. "*Consegero* or *Mirlo*."

2. *CAMPYLORHYNCHUS ZONATOÏDES* (Lafr.)?, Rev. Zool. 1846, p. 92.

Several ex. "*Pavaro tigre*: irides reddish-yellow; bill brownish



above, flesh-colour beneath; legs and feet yellowish. Very noisy, but seldom seen, keeping up a kind of cackle. They appear to be always in threes and fourſ.

More like the New-Granadian bird, which is probably Lafresnaye's *Campylorhynchus zonatoïdes*, than any other described species; but not so decidedly spotted below as in my single specimen of the latter.

3. *THRYPOTHORUS ALBIPECTUS*, Cab.: Schomb. Guian. iii. p. 673.

"Irides hazel; bill black above, flesh-colour beneath; legs and feet blue."

Nearly agrees with an example from Santa Martha, N. G.

4. *TROGLODYTES FURVUS* (Gm.).

One ex., juv.

5. *POLIOPTILA BILINEATA* (Bp.), Consp. p. 316.

Two ex. "♂. Irides hazel; bill black; legs and feet black. In a tree in the bush. ♀. Bill black above, blue below; legs and feet blue."

6. *PARULA BRASILIANA* (Licht.).

One ex. "Stomach contained insects."

7. *GEOTHLYPIS SEMIFLAVA*, sp. nov.

♂. *Olivaceo-viridis: pileo antico et lateribus capitis totis nigris: subtus flava: tectricibus subalaribus pallide flavis: rostro superiore plumbeo, inferiore corneo: pedibus pallide corylinis.*

♀. *Obscurior, pileo concolore olivaceo: orbitis et loris flavescen- tibus.*

Long. tota 5·0, alæ 2·4, caudæ 2·1.

*Hab.* In rep. Equator.

*Mus.* P. L. S.

One ex. "Bill black; legs and feet orange."

Nearly allied to the Mexican *G. formosa*, mihi, P. Z. S. 1858, p. 447, but distinguishable by its paler green colouring above, and brighter, purer yellow below.

I have described the female from a specimen since transmitted by Mr. Fraser from Esmeraldas.

8. *BASILEUTERUS CHRYSOGASTER* (Tsch.): Tsch. Faun. Per. p. 192.

One ex., ♂. "Irides hazel; bill black; legs and feet yellow."

9. *VIREOSYLVA AGILIS* (Licht.): Bp. Consp. p. 329.

One ex., apparently not different from New-Granadian and Brazilian specimens.

10. *HYLOPHILUS* — ?

One ex., in bad condition.

## 11. CYCLORHIS VIRENTICEPS, sp. nov. (Pl. CLXIV.)

*Olivaceus, pileo concolore: fronte et superciliis saturate castaneis: subtus flavus, ventre medio et crisso sericeo-albis: rostro brunneo, mandibula inferiore plumbea: pedibus carneis.*

Long. tota 6·0, alæ 2·9, caudæ 2·3.

*Hab.* In rep. Equator.

*Mus.* P. L. S.

Four ex. "Irides hazel: found in the large trees in the bush." Stomach contained "insects," "a caterpillar." Sexes alike.

A distinctly marked species of this little group, making the seventh in my collection. It is immediately distinguishable by its green head—the same colour as the back. I have given a list of the other species of the genus in Proc. Z. S. 1858, p. 448.

## 12. COTYLE FLAVIGASTRA (Vieill.).

Three ex. "Very common."

## 13. DACNIS EGREGIA, Sclater.

One ex. "Gizzard contained seeds."

## 14. SALTATOR MAGNUS (Gm.).

Several ex.

## 15. SALTATOR FLAVIDICOLLIS, sp. nov.

*Supra cinereus, nisi in uropygio et cauda olivaceo perfusus: superciliis et corpore subtus albis: pectore et collo antico flavo tinctis: rostro nigro, apice flavo: pedibus plumbeis.*

Long. tota 8·0, alæ 3·8, caudæ 3·5.

*Hab.* In rep. Equator.

*Mus.* P. L. S.

A distinct species of *Saltator*, distinguished by the absence of all markings below, and the yellow tinge which pervades the throat and breast.

Three ex. "Irides hazel; bill black, tips and gape yellow. Common: very shy and active."

## 16. ARREMON ERYTHORHYNCHUS, Sclater, P. Z. S. 1855, p. 83. pl. 89.

Three ex. "In stomach, seeds and insects."

## 17. TACHYPHONUS LUCTUOSUS, Lafr. et D'Orb.

Two ex. "Bill black; legs and feet blue."

## 18. RAMPHOCELUS ICTERONOTUS, Bp.

Several ex. "By no means uncommon."

## 19. TANAGRA CANA, Sw.?

Several ex. of both sexes. "Irides hazel; bill black above, blue beneath; legs and feet dark lead-colour."



CYCLORHIS VIRENTICEPS



## 20. EUPHONIA CRASSIROSTRIS, Sclater, P. Z. S. 1856, p. 277.

One ex. "Bill black above, blue below; legs and feet blue. Very shy and quick: found in moderate-sized trees in the deep bush."

## 21. EUPHONIA XANTHOGASTRA, Sund. (?).

A single specimen, differing from the usual coloration of this species in having no white on the outer rectrices.

## 22. PROCNIA OCCIDENTALIS, Sclater.

One ex. "Irides hazel; bill black. Three or four were together on the top of a large tree in the deep bush. The stomach contained insects."

## 23. EMBERNAGRA CHRYSOMA, sp. nov.

*Olivacea, axillis et tectricibus subalaribus flavissimis: capite cinereo, pilei striis duabus et vitta utrinque per oculos trans-eunte nigris: superciliis et corpore subtus albis, hoc latera-liter cinerascante: crisso flavicante: rostro nigro: pedibus clare brunneis.*

Long. tota 7·0, alæ 3·3, caudæ 2·9.

*Hab.* In rep. Equator.

*Mus.* P. L. S.

Four ex. "Irides hazel; legs and feet flesh-colour. Common in the underwood of the deep bush: gizzard contained seeds."

This *Embernagra* is nearly allied to *Embernagra conirostris*, Bp., but distinguished by its larger size, bright yellow axillaries, and olive-green back. I am now acquainted with the following species, which I refer to this group:—

(1) *E. PLATENSIS*\* (Gm.): Bp. Consp. p. 483; ex Brasil. Merid. et Paraguay, &c. Mus. P. L. S.

(2) *E. LONGICAUDA*, Strickl.: Bp. Consp. p. 483. Mus. H. E. S.

(3) *E. CONIROSTRIS* (Bp.).—*Arremon conirostris*, Bp. Consp. p. 488; ex Nov. Granada int. et littorali. Mus. P. L. S.

(4) *E. CHRYSOMA*, *supra*.

(5) *E. CHLORURA*, Bp. Consp. p. 483.—*Pipilo chlorurus*, Baird, Rep. p. 519; ex Mex. Bor. Mus. P. L. S.

(6) *E. RUFIVIRGATA*, Lawrence: Baird, Rep. p. 487; ex Mex. Bor. Mus. P. L. S.

## 24. VOLATINIA SPLENDENS (Vieill.).

Two examples.

\* I doubt the distinctness of *E. olivascens* (sp. 2 of P. Bp.'s Consp.) from this. *E. viridis* (P. Bp.'s 3rd species), at least the example in the Paris Museum, seems to be a bad specimen of the same bird.

## 25. SPERMOPHILA OPHTHALMICA, sp. nov.

♂. *Supra coracino-nigra: macula suboculari parva, speculo alari, uropygio et torque cervicali, postice evanescente, albis: subtus alba, torque pectorali lata nigra: rostro nigro, subtus corneo: pedibus nigris.*

♀. *Pallide fusca, subtus fulvescenti-albida.*

Long. tota 4.0, alæ 2.2, caudæ 1.8.

*Hab.* In rep. Equator.

*Mus.* P. L. S.

Three ex. "Common: sometimes in flocks."

This *Spermophila* is allied to *S. mysia* and *S. leucopterygia*, but has brighter and clearer colours. It may be recognized by the white subocular spot.

## 26. ORYZOBORUS ÆTHIOPS, Sclater, P. Z. S. 1860, p. 88.

Examples of both sexes. ♀. *Obscure brunneus, subtus magis ferrugineus: tetricibus subalaribus albis.*

## 27. ORYZOBORUS OCCIDENTALIS, sp. nov.

*Nigerrimus: tetricibus subalaribus nigris: primariorum pogoniis internis et speculo alari exiguo albis: rostro albo: pedibus corneis.*

Long. tota 5.5, alæ 3.0, caudæ 2.4.

*Hab.* In rep. Equator.

*Mus.* P. L. S.

One example. "Irides hazel; bill pinkish flesh-colour; legs and feet brown; gizzard contained seeds. In the bush in company with others."

This bird is a close ally of *O. crassirostris* of Guiana and Trinidad and *O. maximiliani* of Brazil, but has the under wing-coverts black, and the alar spot much smaller, almost obsolete. I have another example of the same species, received in a collection from Bogota.

28. CORYHOSPINGUS CRUENTUS (Less.).—*Tiaris cruenta*, Less. —*Lophospiza cruenta*, Bp. Consp. p. 470.

Examples of both sexes. ♀. *Fuscus: alis nigricantibus rufescente limbatis, subtus pallide fulvus.* "In the deep bush: on one occasion in a flock of 200: irides hazel."

## 29. CASSICULUS PREVOSTI (Less.): Bp. Consp. p. 428.

Three examples, agreeing with New-Granadian and Guatemalan specimens. "Irides pale yellow; bill yellow; legs and feet blue: found in the trees in the deep bush; by no means shy."

## 30. CASSICULUS FLAVICRISSUS, sp. nov.

*Nigerrimus: dorso postico, tetricibus alaribus dorso proximis,*

*crisso et reatricibus ad basin flavissimis : rostro plumbeo, apice albicante : pedibus nigris.*

Long. tota maris 10·0, alæ 5·8, caudæ 4·0 ; fœminæ 8·5, alæ 4·4, caudæ 3·3.

*Hab.* In rep. Equator.

*Mus.* P. L. S.

Four examples. "Irides and bill blue : not shy ; very noisy, in flocks among large trees in the deep bush : stomach contained seeds and insects."

### 31. ICTERUS MESOMELAS (Wagler).

Many examples. "Irides hazel : in the deep forest, and by no means shy."

### 32. STURNELLA BELLICOSA, De Filippi.

Two ex. "*Chirote* : not uncommon in the plains, and apparently the same species as was observed in the corn-fields of Guaranda : stomach contained insects and seeds."

Rather smaller than the specimens noted (P. Z. S. 1858, p. 455) from Cuenca, but not otherwise different.

### 33. SCOLECOPHAGUS — ?

Two ex. of a species of this genus, said to be "common in company with the Garapateros (*Crotophaga*), and the greatest favourite as a cage-bird in the country."

34. FURNARIUS CINNAMOMEUS (Less.).—*Picolaptes cinnamomeus*, Less. Rev. Zool. 1844, p. 93.—*Furnarius longirostris*, v. Pelzeln, Sitz. Akad. Wiss. Wien, xx. p. 158.

Four ex. "*Oyero* : irides pale yellow ; base of lower mandible nearly white, remainder brown ; legs and feet flesh-colour. *Very* common on the plains in the smaller trees and on the tops of the houses, and very noisy. They run, but do not hop. They are said to breed in communities, and build in trees, with a roundabout entrance to the nest."

### 35. XIPHORHYNCHUS THORACICUS, sp. nov.

*Brunneus : alis, uropygio, et cauda ferrugineo-rufis : gula sordide alba : dorsi superi capitis undique et pectoris plumis medialiter ochraceo-albidis, hoc colore nigro anguste circumdato, plumarum marginibus externis brunneis : rostro rubescente : pedibus fuscis.*

Long. tota 10·0, alæ 4·0, caudæ 3·7, rostri a rictu ad apicem linea directa 2·7.

*Hab.* In rep. Equat.

*Mus.* P. L. S.

One ex. "Irides hazel ; bill brownish, paler at base of lower mandible ; legs and feet green : stomach contained insects. Shot running very actively up the trunk of a large tree in the deep forest."

A distinctly marked species of this singular group of *Dendrocopaptinae*, easily recognizable by the clear elongated spots occupying the centre of the feathers of the breast and back. These spots are narrowly surrounded with black, and broadly margined outwardly with the general brown ground-colour. Its size is nearly that of *X. procurvus*, but the bill is rather shorter and more regularly curved. I may add that I possess examples of all the five species described by M. de Lafresnaye in his account of this group (Rev. de Zool. 1850, p. 373 *et seq.*), and two additional, namely the present and another which I consider new\*.

36. *PICOLAPTES SOULEYETII*, Lafr. Rev. Zool. 1850, p. 276 ; Des Murs, Icon. Orn. pl. 69.

Several ex. "Irides hazel."

37. *DENDROCOPS ATRIROSTRIS*, Lafr. et D'Orb.

Two ex. "Irides hazel ; bill black ; legs and feet lead-coloured."

38. *SITTASOMUS ERITHACUS* (Licht.).

Two ex. "Irides hazel." This bird seems scarcely recognizable from Eastern specimens, except by the slightly different tinge of chestnut on the rump and tail.

39. *SYNALLAXIS PUDICA*, Sclater, P. Z. S. 1859, p. 191.

Several ex., not in very good condition, but seemingly sufficiently like Bogotan skins. "Irides whitish."

40. *THAMNOPHILUS TRANSANDEANUS*, Sclater, P. Z. S. 1855, p. 18.

Many ex. of both sexes. "Irides red ; bill black ; legs and feet blue : found near the ground in the deep bush."

41. *THAMNOPHILUS NÆVIUS* (Gm.).

Three ex. "Skulking about in the underwood."

42. *DYSITHAMNUS SEMICINEREUS*, Sclater, P. Z. S. 1855, p. 90, pl. 97.—*D. mentalis*?, Sclater, P. Z. S. 1860, p. 67.

Three ex. Only differing from New-Granadian birds in having the throat rather whiter : erroneously referred before to *D. mentalis*.

\* *XIPHORHYNCHUS PUSILLUS*, mihi.

*Brunneus : alis, cauda, et uropygio ferrugineo-rufis : capite nigricante et cum dorso superiore fulvo longitudinaliter lineolato : gula fulva : subtus dorso concolor, sed plumis omnibus linea lata et elongata fulva medialiter notatis : ventre imo crissoque immaculatis : rostro albicanti-corneo, basi obscura : pedibus virescenti-fuscis.*

Long. tota 8·0, alæ 3·8, caudæ 3·5, rostri a rictu ad apicem lin. dir. 2·0.

*Hab.* In Nov. Granada int.

*Mus.* P. L. S.

*Obs.* Affinis *X. procurvoidei* ex Cayenna, sed minor, et lineis longitudinalibus fulvis ventrem occupantibus prorsus nota bilis.



## 43. FORMICIVORA CONSOBRINA, sp. nov.

♂. *Atra* : dorsi postici totius plumarum basibus, maculis tectricum minorum parvis rotundis, et tectricum majorum et caudæ rectricum apicibus albis.

♀. *Supra mari similis, subtus saturate castanea.*

Long. tota 4·2, alæ 1·8, caudæ 1·8.

*Hab.* In rep. Equator.

*Mus.* P. L. S.

One pair. "Irides hazel."

Allied closely to *F. quixensis* and *F. boucardi*, particularly to the former, but differs in its smaller size and the uniform rich chestnut colouring of the female below; in *F. quixensis* the female's throat being black, and in *F. boucardi* the female being wholly of a paler red below.

## 44. CERCOMACRA MACULOSA, sp. nov.

♂. *Cinerea* : interscapulii macula celata, tectricum alarium nigrarum marginibus et rectricum apicibus albis : gutturis et pectoris antici plumis medialiter albis nigro circumcinctis : rostro corneo : pedibus fuscis.

♀. *Fuscescenti-olivascens, subtus ferruginea, lateraliter fuscescens.*

Long. tota 6·0, alæ 2·5, caudæ 2·5.

*Hab.* In rep. Equator.

*Mus.* P. L. S.

Three examples in bad condition. "Creeps about in the underwood; often heard, but seldom seen."

## 45. PYRIGLENA PICEA, Cab. Orn. Not. p. 212.

Two ex. "Irides red; bill, legs, and feet black: creeping about in the underwood: stomach contained insects."

Blacker than the Eastern *P. atra*, though otherwise very similar, and perhaps referable to Cabanis's species.

## 46. CHIROMACHÆRIS MANACUS (Linn.).

Two ex. "Bill black, base of lower mandible pale; legs and feet blue, nearly black: stomach contained insects and fruit."

## 47. PACHYRHAMPHUS HOMOCHROUS, Sclater.

Many ex. of both sexes.

## 48. PACHYRHAMPHUS SPODIURUS, sp. nov.

♂. *Cinereus* : loris albidis : capite toto cum dorso superiore nigro : alis nigricantibus, albo extus limbatis : cauda nigricantibus, rectricum marginibus pallidioribus et ipsis apicibus albicantibus : subtus dilute cinereus, remigum pogoniis internis partim albis.

♀. *Castaneus, subtus dilutior, gutture albicantiore, remigum pogoniis interne nigricantibus.*

Long. tota 5·5, alæ 3·0, caudæ 2·3.

*Hab.* In rep. Equator.

*Mus.* P. L. S.

Four ex. No. 2270, "♂. Irides hazel; bill blue; legs and feet dark: in stomach, insects and vegetable matter: found in the top of a tree in the thick bush." No. 2152, "♀ by diss.; bill black above, blue below; legs and feet blue."

This Becard is distinct from any of those enumerated in my Synopsis of these birds (P. Z. S. 1857, p. 67). It differs from all the *Bathmiduri* (Sect. D) in wanting the broad white terminations to the tail-feathers, and I am inclined to consider *P. cinereus* its nearest ally. The second primary of the male is of the usual abnormal character. It is shorter by 0·85 (inch) than the first, and slightly bifid at the extremity.

#### 49. *ATILA TORRIDUS*, sp. nov.

*Ferrugineo-rufus: uropygio et corpore subtus dilutioribus et præcipue in gutture et ventre imo magis citrinis: alis fusco-nigricantibus rufo limbatis, secundariis dorso proximis omnino rufis: cauda unicolore rufa: rostro et pedibus nigris.*

Long. tota 8·0, alæ 4·0, caudæ 3·5, rostri a rictu 1·2.

*Hab.* In rep. Equat.

*Mus.* P. L. S.

Three ex. "Irides hazel; bill black; legs and feet blue. Seen high in the interior of a large tree."

This *Attila* is most nearly allied to *A. thamnophiloides* (Spix), of the species with which I am acquainted\*, but distinguishable by its longer and rather stronger bill, the much lighter rufous colouring above (which in *A. thamnophiloides* is chestnut), and lemon-yellow belly. The wings are also considerably longer.

#### 50. *FLUVICOLA ATRIPENNIS*, sp. nov.

*Alba: striga per oculos, alis, et cauda nigris, secundariis alarum anguste, rectricibus late albo terminatis: interseapulio pallide cinereo: rostro et pedibus nigris: tectricibus subalaribus albis.*

Long. tota 5·5, alæ 3·0, caudæ 2·5.

*Hab.* In rep. Equator.

*Mus.* P. L. S.

*Obs.* Affinis *F. climacuræ*, ex Brasilia, sed alis intense nigris, secundariis albo limbatis, interseapulio dilutiore et tectricibus subalaribus albis diversa.

Several ex. "Irides hazel; bill, legs, and feet black. Very common everywhere, particularly on the road, feeding on the ground and perching on the fences. Very sprightly in action, carrying the head erect, and constantly wagging the tail up and down like a Wag-tail (*Motacilla*)."

\* For a list of other species of *Attila*, see P. Z. S. 1859, p. 41.

## 51. MUSCIGRALLA BREVICAUDA, Lafr. et D'Orb.

One ex. "Irides hazel; bill black, base of lower mandible blue; legs and feet flesh-colour. Seen on some dead brushwood by the road-side."

## 52. MEGARHYNCHUS CHRYSOGASTER, sp. nov.

*Megarhyncho mexicano et M. pitanguæ affinis, sed ab utroque colore abdominis lætissime aureo diversus: quoad rostrum et crassitiam his duabus intermedius.*

One ex. A third climatal variety or species, whichever it may be, of this genus of *Tyrannidæ*, distinguished by its full bright yellow belly. The only specimen is not in very good plumage; but Mr. Fraser has since sent another from Esmeraldas. In accordance with M. Heine's views (Cab. Journ. f. Orn. 1859, p. 337), I now employ *Megarhynchus* as a generic name for these birds. But is not *this* species the bird considered by him as *Scaphorhynchus chrysocephalus* of Tschudi? Tschudi's figure is certainly detestable; but his species, of which I have specimens collected by Mr. Fraser at Pallatanga, is well marked, and can in no way be considered as a climatal variety of *M. pitangua*. It is more closely allied, in my opinion, to *Myiodynastes*, though, as I have remarked (P. Z. S. 1859, p. 43), "leading off towards *Scaphorhynchus*," i. e. *Megarhynchus*.

## 53. TYRANNUS MELANCHOLICUS, Vieill.

Many ex.

## 54. TYRANNUS NIVEIGULARIS, sp. nov.

*Supra cinereus, dorso olivaceo perfuso, capitis crista interne flava: loris et regione auriculari nigricanti-cinereis: alis nigris, primariis stricte, secundariis et tectricibus late albido limbatis: cauda nigra unicolore, rectricum apicibus et harum externarum marginibus externis vix albicantibus: caudæ tectricibus superioribus nigris, olivaceo terminatis: subtus pallide flavus, gutture et collo antico pure albis, hujus lateribus et pectore summo cinereo vix lavatis: rostro et pedibus nigris.*

Long. tota 7·0, alæ 4·1, caudæ 3·1.

*Hab.* In rep. Equator.

*Mus.* P. L. S.

One ex. "Irides hazel; bill and legs black."

A species of true *Tyrannus*, looking to its general structure and acuminated primaries, distinguishable by its small size, pure white throat and neck, and black tail. The primaries of the single specimen are not fully developed; but the three first are somewhat obtusely acuminate, quite as much as in *T. melancholicus*.

## 55. MYIARCHUS PHÆOCEPHALUS, sp. nov.

*Pallide olivaceus: capite cinereo, pileo summo obscuriore: alis fusciscenti-nigris, primariis stricte, tectricibus et secundariis latius ochracecente marginatis: subtus pallide flavus, gutture*

*toto pallide cinereo: cauda nigricanti-fusca, rectricum extimarum marginibus et omnium apicibus dilutioribus: rostro nigricanti-corneo: pedibus nigris.*

Long. tota 7·0, alæ 3·5, caudæ 3·4, rostri a rictu 1·0.

*Hab.* In rep. Equator.

*Mus.* P. L. S.

Two examples, not in good condition, of this apparently unnoticed species of *Myiarchus*; of the size and general structure of *M. ferox*, but recognizable by its pale, rather greyish, olive back and dusky-grey head.

56. MYIOPHOBUS — ?

57. MYIOPHOBUS — ?

Two species of this division of *Tyrannidæ* (as typified by *M. virgatus*) are in the collection. These, with others of this very difficult group, I must leave for future determination.

58. PYROCEPHALUS NANUS, Gould?

Numerous examples of a *Pyrocephalus*, which agree with the description of *P. nanus* in having the outer margins of the external rectrices and tips of all "light greyish-brown." It does not, however, seem to be inferior in size to the Eastern species, as far as I am able to judge by the specimens in my possession.

59. MYIOBIUS BARBATUS (Gm.).

Two ex., apparently not different from the Eastern bird.

60. CYCLORHYNCHUS SUBBRUNNEUS, sp. nov.

*Brunnescenti-oleagineus: alis nigricantibus, fulvescenti-brunneo extus marginatis: cauda rufescenti-fusca unicolore: subtus pallide cineraceus, olivaceo perfusus, gutture et ventre medio dilutioribus: tectricibus subalaribus fulvescentibus: rostro superiore nigro, inferiore flavo: pedibus plumbeis.*

Long. tota 7·5, alæ 3·4, caudæ 3·2.

*Hab.* In rep. Equator.

Two ex. "Irides whitish." This Tyrant may, I think, be well placed in the genus *Cyclorhynchus*, although not a typical member of the group. The bill is much more elongated than that of *C. olivaceus*, and not so broad at the base, but does not differ in proportions from that of *C. flaviventris*. The third and fourth primaries are nearly equal, and longest in the wing; the fifth is slightly shorter; the sixth nearly of the same length as the second.

61. MUSCIVORA OCCIDENTALIS, sp. nov.

Mr. Fraser has sent three specimens of a Crowned-Tyrant from Babahoyo, which will probably require a new name, as being distinct from the species at present known. It differs from *Muscivora regia*

of Cayenne and *Muscivora swainsoni* of Brazil\* in its much longer bill, in which respect it approaches *M. mexicana*. Its crest is of a brighter blood-red than that of *M. regia*; the back is brown, without any olive tinge; the rump is of a brighter ferruginous, and the tail is longer. In a Synopsis of the *Tyrannidæ* which I am now preparing, I hope to be able to give further details concerning this and other groups of the same family.

62. TODIROSTRUM CINEREUM (Linn.).

Three ex.

63. TODIROSTRUM SQUAMICRISTATUM (Laf.).

64. TODIROSTRUM — ?

An imperfect skin of a third species of this genus.

65. MYIOZETETES GUIANENSIS, Cab. & Hein., Mus. Hein. ii. p. 61.

Several examples of a species which I am not at present able to distinguish from this bird.

66. ELAINEA — ?

67. ELAINEA — ?

Examples of two species of this group of *Tyrannidæ*.

68. EUPSILOSTOMA PUSILLUM, Selater, P. Z. S. 1860, p. 68.

Several ex.

69. TYRANNULUS CINEREICEPS, Selater, P. Z. S. 1860, p. 69.

One ex.

70. MIONECTES OLEAGINEUS (Licht.).

One ex.

71. LEPTOPOGON — ?

One ex. of a species of this group, in an imperfect state. It seems to be different from *L. superciliaris*, and is probably new.

72. AMAZILIA DUMERILII.

Many ex. "Bill red with black tip."

73. AMAZILIA RIEFFERI.

Many ex. "Noticed feeding from the bark of a large tree in the forest."

74. JULIAMYIA TYPICA.

Many ex. "Irides hazel; upper mandible black, lower red with

\* Confer v. Pelzeln in Sitz. Akad. Wien, xxxi. p. 326.

black tip ; legs and feet nearly black. Not very common, and only found in the deep bush, where they feed on the tops of largish trees."

75. LAMPORNIS MANGO.

Two ex. "Bill, legs, and feet black. From a low tree on the way-side."

76. NYCTIDROMUS — ?

One ex., in very bad condition.

77. CERYLE TORQUATA (Linn.).

One ex. "Irides hazel ; bill black, with a whitish spot at the base of the upper mandible, and the basal half of the lower mandible of the same colour ; legs and feet nearly flesh-colour. Frequents the larger trees ; stomach contained fish-bones and scales."

78. CERYLE AMERICANA (Gm.).

Three ex. "Irides hazel : very common on the branches of the trees which overhang the river in retired places ; flies swiftly, and feeds on fish."

79. BUCCO LEUCOCRISUS.

*Similis* Bucconi macrorhyncho ex Cayenna, sed rostro majore, fronte latiore albo, torque pectorali angustiore et ventre medio crissoque pure albis distinguendus.

*Hab.* In rep. Equator.

*Mus.* P. L. S.

If *Bucco macrorhynchus* of Cayenne, *B. swainsoni* of Brazil, *B. hyperrhynchus* of the Upper Amazon, and *B. dysoni* of Central America are to be considered good species, then this must constitute a fifth, and another, of which I have two examples from the Rio Napo, a sixth species of the section. The alternative is to regard them all as localized varieties of one widely distributed species ; but even in that case they would require separate names and descriptions.

80. MOMOTUS — ?

Several examples of a species most nearly allied to *M. microstephanus* of New Granada, but perhaps ultimately separable.

81. TROGON MELANURUS, Sw. : Gould, Mon. Trogon. pl. 18.

Several ex. "*Chocota* : irides white ; upper mandible with a large yellow spot at the base, lower mandible yellow ; legs and feet greenish ; soles yellow. Much more active than any other *Trogon* which I have yet had an opportunity of observing, hopping from branch to branch in the lower part of a large tree in the deep bush. Solitary and silent. Stomach contained berries of two kinds, and a caterpillar."

82. TROGON CALIGATUS, Gould, Mon. Trogon. pl. 7.

"Irides red ; cere yellow ; legs and feet blue. Stomach of

ex. 2279 contained seeds, and grasshoppers and other insects; of 2317, seeds and vegetable matter."

## II. SCANSORES.

### 83. PIAYA NIGRICRISSA.

*Piaya mehleri*, Sclater, P. Z. S. *passim*, nec Bp.

Three examples. I have hitherto considered the New-Granadian and Peruvian form of *Piaya* as referable to *P. mehleri* of Prince Bonaparte. Having lately been able to examine his type in the Leyden Museum, I find that the locality given to it must have been wrong, for the bird in question is the species of the Mexican *tierra caliente* and Guatemala, which I have lately named *Piaya thermophila* (P. Z. S. 1859, p. 368). The species of *Piaya* allied to *P. cayana* in my collection are the following:—

(1) *Piaya macrura* (Gambel, Journ. Acad. Philad. i. p. 215.—*P. circe*, Bp. Consp. i. p. 110), ex Guiana.

(2) *Piaya cayana*, ex Cayenna et ins. S. Trinit.

(3) *Piaya nigricrissa*, mihi, ex Nov. Granada, rep. Equat. et Peruv.

(4) *Piaya mehleri*, Bp. (Consp. p. 110, *mexicana*, olim, et *thermophila*, nuper, Sclater), ex reipubl. Mexicanæ reg. calida et Guatemala.

(5) *Piaya mexicana*, Sw. (Sclater, P. Z. S. 1859, p. 368), ex rep. Mexicana Oaxaca.

### 84. PIAYA RUTILA (Vieill.): Bp. Consp. p. 110.

Three examples.

### 85. DIPLOPTERUS NÆVIUS (L.).

Two ex., immature.

### 86. CROTOPHAGA ANI, Linn.

One ex. "*Garapatero*: irides hazel; bill, legs, and feet black. This is the only species of bird I have seen in Ecuador in anything like numbers: there must be thousands of them. They are extremely common round the town and on the plains, in fact near every place where cattle feed. They are generally seen near the nose of the beasts, and occasionally fly up to capture insects. They do not perch on the cattle. When disturbed they fly (with three flaps of the wings, then a sail, and then flaps repeated) off to the nearest bush, where they sit huddled together in a heap."

### 87. CROTOPHAGA SULCIROSTRIS, Sw.

Three examples, agreeing with the Central American and Mexican bird. "*Garapatero*: from the deep bush among the underwood; the note sounded to me very different from that of those on the plains" (probably *C. ani*). "Stomachs contained insects and seeds."

## 88. PTEROGLOSSUS ERYTHROPYGIUS.

Three ex. "These birds fly swiftly and heavily, in a straight line, and drop suddenly on a branch like a *Trogon*."

## 89. CENTURUS PUCHERANII (Malh.).

Four ex. "Irides hazel." Agrees with specimens in my collection from Mexico and Guatemala.

## 90. CHLORONERPES RUBIGINOSUS (Sw.).

Four ex. "Flight quick, but heavy."

## 91. CHLORONERPES CECILII (Malh.)?

Two ex., probably referable to this species, but in a bad state of preservation.

## 92. CHLORONERPES CALLONOTUS (Waterh.).

*Picus callonotus*, Waterhouse, P. Z. S. 1840, p. 182.—*P. cardinalis*, Less., Echo d. M. S. 1845, p. 9; Des Murs, Icon. Orn. pl. 59.—*Venilia callonota*, Bp. Consp. p. 129.

Three ex. "Irides hazel; bill bluish horn-colour; legs and feet bluish."

Prince Bonaparte, mistaking the true locality of this species, placed it in his genus *Venilia*. There are examples in the British Museum procured in the island of Puna in the Gulf of Guayaquil by Mr. Barclay, and Lesson's type is said to have been from Guayaquil.

## 93. CELEUS UNDATUS (Linn.): Bp. Consp. p. 129.

One ex., ♀. Probably of this species, of which I do not possess other specimens.

94. DRYOCOPUS SCLATERI, Malh. (*antea*, p. 71).

One ex. I much suspect that this will turn out to be the *Picus guayaquilensis* of Lesson, Echo d. M. S. 1845, p. 920.

## 95. DRYOCOPUS FUSCIPENNIS, sp. nov.

*Niger*: *linea capitis collique laterali, scapularibus dorso proximis et tectricibus subalaribus flavido-albidis: remigibus reetricibusque præcipue in marginibus externis fusciscentibus: abdomine cinerascens-fusco, nigro maculato: rostro et pedibus nigris: ♂ plaga malari et capite toto cristato coccineis: ♀ fronte nigra.*

Long. tota 13·0, alæ 6·8, caudæ 5·2.

*Hab.* In rep. Equator.

*Mus.* P. L. S.

Four examples. This apparently undescribed Woodpecker is a close ally of the Brazilian *D. lineatus*, but may be distinguished by the brown colouring of the wings and tail and the absence of distinct markings on the abdomen. The crissum is brownish cinereous, edged with white, instead of being distinctly banded with black.



## 96. PICUMNUS GRANADENSIS (Lafr.).

Three ex. As in a former specimen from Nanegal\*, the spots on the head of the male are yellow instead of red, which is their colour in my New-Granadian examples; but I do not detect other differences.

## 97. CONURUS ERYTHROGENYS (Less.).

Two ex. "*Catanica*: stomach contained seeds."

98. BROTOGERYS PYRRHOPTERUS (Lath.).—*Psittacu spyrrho-  
pterus*, Lath. Ind. Orn. Suppl. p. xxxii.

Many ex. "*Perico*: irides hazel; bill, cere, and legs flesh-colour. Common on the tops of the highest trees: not so shy as most Parrots. In Guayaquil I saw this species in hundreds in the gardens of the town-houses." Stomachs contained "seeds."

## 99. PIONUS MENSTRUUS (Linn.).

One ex. "*Loro*: stomach contained seeds."

## 100. PSITTACULA CÆLESTIS (Less.).

Many ex. "*Vivina*: beak, cere, legs and feet pale flesh-colour. Stomach contained seeds: very common everywhere, in small flocks in the trees, and noisy."

## III. ACCIPITRES.

## 101. CATHARTES AURA (Linn.).

One ex., ♀. "Irides brown; beak white; legs and feet white; head and neck red; corrugations in front of the eyes and three transverse plates on the top of the head white. There were several specimens about, but not *in* the town. I have seen three together."

## 102. CATHARTES ATRATUS.

Four ex. "*Gallinazo*." Spec. 2186, "♂. Irides hazel; bill greenish horn-colour; legs and feet black. Here in hundreds. I am inclined to think this bird distinct from the mountain species." Spec. 2329, "♀. Bill black, with a bluish culmen, and a blue spot on the upper mandible near the cere; legs greenish; feet black, with a mouldy appearance between each scale; no corrugations about head or neck; the feathers of the back of the neck stand reversed. These birds are said to scratch away the sand and devour the eggs laid by the Alligators, which are here by thousands." Spec. 2384, "Beak bluish horn-colour; head and neck black, with the corrugations thickening as they get lower down; legs and feet black, with a mouldy appearance between the scales, which I imagine to be dirt." "I noticed a *Gallinazo* in the river some yards from the bank; he

\* P. Z. S. 1860, p. 95.

swam bravely and landed in safety. Others, collected on the bank, drank and bathed."

103. *POLYBORUS THARUS* (Mol.).

"*Curicinga*." "Contents of stomach, insects and maggots. Very common on the plains, and by no means shy; sometimes found in high trees."

104. *URUBITINGA ZONURA* (Shaw).

Three ex. Spec. 2394, "♀. Irides hazel; bill black, with a blue spot at the base of the upper mandible and base of the lower mandible; cere, face, gape, legs and feet yellow. Killed at the top of a tall tree; not shy; stomach contained fish and frogs." Spec. 2422, "♂. Bill black, with a blue spot at the base of the upper and lower mandible; cere greenish; face bluish; legs and feet yellow, with the exception of some blackish scales down the front of the tarsi and toes."

105. *BUTEOGALLUS MERIDIONALIS*.

Six ex. Spec. 2177, "Irides hazel; bill black; cere, legs and feet yellow: stomach contained hair and small beetles." Spec. 2261, "♂. Irides brownish-yellow; upper mandible blue, with black tip,—lower, base blue, then yellow, tip black; cere and gape yellow; legs and feet orange." This bird is seen sitting on the fences, tops of trees, &c., and utters a shrill cry. It is very destructive to the poultry. Stomach contained in one example "grasshoppers and other insects," in another "hair of mammals."

106. *SPIZIGERANUS UNICINCTUS* (Temm.).

One ex., ♂. "Irides reddish-hazel; bill blue, with black tip; cere, face, legs and feet yellow: stomach contained grasshoppers."

107. *HERPETOTHERES CACHINNANS*.

One ex. "♂. Irides hazel; bill black; cere orange; legs and feet orange: stomach contained a snake."

108. *ASTURINA MAGNIROSTRIS*.

Several ex.

109. *ASTURINA NITIDA*.

Two ex. Spec. 2326, "♂. Irides yellow; beak black, with blue base; cere, gape, legs and feet yellow: stomach contained remains of a snake and insects."

110. *GERANOSPIZA CÆRULESCENS* (Vieill.).

Two ex. Spec. 2159, "♂. Irides red; upper mandible black, with a blue spot at the base; under mandible blue; legs and feet red: stomach contained grasshoppers: by no means shy; seen feeding on the plains."

111. *ROSTRHAMUS SOCIABILIS*.

One ex.

112. *CYMINDIS CAYANENSIS*.

One ex. ♂. Found in the deep bush ; a dull bird.

113. *GLAUCIDIUM FERRUGINEUM*.

One ex. "Irides yellow ; bill greenish-yellow ; feet yellow."

114. *GLAUCIDIUM INFUSCATUM* (Temm.).

Two ex.

## IV. COLUMBÆ.

115. *COLUMBA VINACEA*, Temm.One ex. "*Paloma real*."116. *COLUMBA RUFINA*, Temm.

Three ex. "*Paloma cuculi*: irides orange ; bare space round the eye red ; bill black ; legs and feet red. Common, but very shy ; found in the deep bush : feeds principally on the ground."

117. *LEPTOPTILA VERREAUXII*, Bp. Consp. ii. p. 73.

Two ex., agreeing with the Pallatanga bird : the inner webs of the primaries in this species are wholly rufous. I am not sure as to its distinctness from *L. rufaxilla* of Cayenne ; but it appears different from the Mexican form which bears the latter name.

118. *LEPTOPTILA ALBIFRONS*, Bp. Consp. ii. p. 74 ?

One ex. of a species belonging to this section of the division *Leptoptila*, perhaps more strictly referable to Prince Bonaparte's *L. dubusi*, having the lateral tail-feathers black.

119. *COLUMBULA CRUZIANA* (D'Orb.) ?

One ex. "Irides white ; bill black, with base of lower mandible flesh-colour ; legs and feet flesh-colour : very common everywhere."

120. *TINAMUS* — ?

An imperfect skin of a small species allied to *T. parvirostris*.

121. *ORTALIDA RUFICEPS* (Wagler).—*Penelope ruficeps*, Wagler, Isis, 1830, p. 1111.

Four ex., seemingly agreeing with Wagler's description. "*Gua-characa*: irides hazel ; bill blue ; face bluish ; throat reddish ; legs and feet blue. Very shy, but noisy: always in small communities in the high trees: stomachs contain seeds and leaves." Its note is said to be "*Trabaja—trabaja*" (Work—work), to which the response of the answering bird is said to be "*¿ Para que? ¿ Para que?*" (Wherefore?).

## 122. ARAMUS SCOLOPACEUS (Gm.).

Agrees with S. American examples. "Irides hazel; bill yellow and black; legs and feet black: from a small lagoon in the deep bush, sitting on the ground."

## 123. NYCTICORAX VIOLACEUS (Gm.).

One ex., not adult.

## 124. TIGRISOMA TIGRINUM (Gm.).

One ex. in immature plumage.

## 125. EGRETTA LEUCE.

One ex. in bad condition, but apparently of this species. Stomach contained "fish and grasshoppers."

## 126. TANTALUS LOCULATOR, Linn.

One ex. in bad condition.

## 127. HOPLOPTERUS CAYANUS (Lath.).

Several ex.

128. HIATICULA COLLARIS (Vieill.).—*Charadrius azaræ*, Temm.

One ex. "Irides hazel; bill black; legs and feet flesh-colour."

## 129. HIMANTOPUS NIGRICOLLIS, Vieill.

One ex.

## 130. MICROPALAMA HIMANTOPUS, Bp.

Two ex. of this species killed in September,—the first I have seen from so far south.

## 131. GAMBETTA FLAVIPES (Gm.).

One ex. "Irides hazel; bill black; legs and feet orange. Common about the ponds that are left on the plains in the dry season. Noisy and shy."

## 132. PARRA JACANA, Linn.

Three examples in different states of plumage. "Irides hazel; bill and spurs orange; cere, wattles, and base of upper mandible deep red or lake; legs and feet bluish. Common about the lagoons, but shy: dives well."

## 133. RHYNCHOPS NIGRA, Linn.

One ex. "Seen skimming over the surface of the lagoons, and occasionally dipping its bill in the water."

## 134. PHALACROCORAX — ?

Two ex. of a species of Cormorant in bad condition.

4. LIST OF BIRDS COLLECTED BY MR. FRASER AT ESMERALDAS, ECUADOR, WITH DESCRIPTIONS OF NEW SPECIES. BY P. L. SCLATER.

Mr. Fraser passed part of October, November, and December 1859, at Esmeraldas, on the coast of Ecuador, on his route from Guayaquil to Panama by sea. During his stay he collected about 170 specimens of birds, belonging to 93 species, of which I have subjoined the names, as far as I have been able to determine them. Many of the species obtained at Babahoyo occur again in the present series; but there are several new and of interest which were here met with for the first time.

1. POLILOPTILA BILINEATA (Bp.): Sclater, P. Z. S. 1855, p. 12.  
Two ex. "Stomach contained insects."

2. CYPHORINUS PHÆOCEPHALUS, sp. nov.

*Supra saturate brunneus, pileo nigricante: alis et cauda extus nigro obsolete transfasciatis: subtus dilutior: gula, collo et pectore toto antico intense ferrugineo-rufis: rostro nigricanti-corneo: pedibus fuscis.*

Long. tota 4·8, alæ 2·5, caudæ 1·3.

*Hab.* In rep. Equator. Occ.

*Mus.* P. L. S.

Two ex. "Flying from bush to bush, singing: some four or five others near the same spot."

Nearly allied to *C. modulator*, D'Orb.; but distinguished by its dusky head, larger bill, and the deeper brown colouring of the throat.

3. THRYOTHORUS NIGRICAPILLUS, Sclater, P. Z. S. 1860, p. 84.

Three examples. The specimen previously described was not quite mature. An adult bird has the whole throat and breast pure white, the cross-markings having disappeared.

4. TROGLODYTES FURVUS (Gm.).

Two examples.

5. DENDRÆCA AUREOLA (Gould)?

*Sylvicola aureola*, Gould, Zool. Beagle, ii. p. 86. pl. 28.

One ex., probably a female of this species, which is doubtless the representative of *D. æstiva* in this region.

6. GEOTHLYPIS SEMIFLAVA, Sclater, *antea*, p. 273.

Examples of both sexes.

7. PARULA BRASILIANA (Licht.).

One ex.

8. BASILEUTERUS SEMICERVINUS, Sclater, *antea*, p. 84.

One ex.

## 9. SETOPHAGA RUTICILLA (Linn.).

Two ex.

## 10. PROGNE DOMINICENSIS (Gm.).

One ex.

11. COTYLE RUFICOLLIS (Vieill.).—*Hirundo ruficollis* et *H. flavigaster*, Vieill.

Two examples differing from Eastern specimens only in having the rump whitish. The same is the case in the young bird noted *antea*, p. 274.

## 12. CHLOROPHANES ATRICAPILLA (Vieill.).

One ex. "From a lofty tree in a Cacao plantation."

## 13. DACNIS EGREGIA, Sclater, P. Z. S. 1854, p. 251.

♀. *Dilute olivacea, abdomine flavo.*

Two ex. ♂ et ♀. ♂, "irides bright orange; in stomach vegetable matter." ♀, "irides deep orange; bill black; base of lower mandible blue: killed in the top of a lofty tree: in stomach black seeds."

## 14. CERTHIOLA LUTEOLA, Cab.

One ex. ♀. "In stomach insects."

## 15. PROCNIAS OCCIDENTALIS, Sclater.

One ex. ♀. "Killed in the top of a lofty tree when in company with a male: stomach contained ants and a large green caterpillar."

## 16. CALLISTE CYANEICOLLIS (Lafr. et D'Orb.).

Two ex. "From high trees:" in stomachs "insects and vegetable matter."

## 17. CALLISTE GYROLOIDES (Lafr.).

Three ex. "From tall trees."

## 18. TANAGRA MELANOPTERA, Hartl.

One ex. Stomach contained "a seed and vegetable matter."

## 19. TANAGRA CANA, Sw.?

"Found in companies of three or four in the lofty trees in the Cacao plantations."

## 20. TACHYPHONUS LUCTUOSUS (Lafr. et D'Orb.).

Two ex. ♂ et ♀. "In the underwood near the ground."

## 21. RAMPHOCELES ICTERONOTUS, Bp.

Many ex. "Common in small parties of from two to six."

22. *PYRANGA ÆSTIVA* (Linn.).

Three ex.

23. *ARREMON ERYTHORHYNCHUS*, Sclater.24. *SALTATOR MAGNUS* (Gm.).

Three ex. In stomach "seeds."

25. *PITYLUS GROSSUS* (Linn.).

Three ex., agreeing with specimens from Cayenne. Stomachs contained "seeds and vegetable matter."

26. *HEDYMELES LUDOVICIANUS*.

One ex.

27. *GUIRACA* — ?One ex., a female of a species allied to *G. cyanea*.28. *SPERMOPHILA OPHTHALMICA*, Sclater, *antea*, p. 276.Three ex. "Killed on the Cacao plant (*Theobroma*): stomach contained minute seeds."29. *SPERMOPHILA GUTTURALIS* (Licht.).

One ex.

30. *EMBERNAGRA CHRYSOMA*, Sclater, *antea*, p. 275.

"Found in small parties amongst the fallen underwood in a Cacao plantation:" stomachs of two contained "insects."

31. *ICTERUS MESOMELAS*, Wagler.

"Very shy; often heard, but seldom seen."

32. *CASSICULUS PREVOSTI* (Less.).

Two ex.

33. *XIPHORHYNCHUS THORACICUS*, Sclater, *antea*, p. 277.34. *PICOLAPTES SOULEYETII*, Lafr.35. *DENDROCOPS ATRIROSTRIS*, Lafr. et D'Orb.36. *SITTASOMUS ERITHACUS* (Licht.)?

"Appears entirely red during its short but rapid flights."

37. *XENOPS GENIBARBIS*, Temm.

Three examples, hardly distinguishable from ordinary Eastern specimens.

38. *SYNALLAXIS PUDICA*, Sclater.

One ex., agreeing with those from Babahoyo.

39. *THAMNOPHILUS TRANSANDEANUS*, Sclater.

One ex. Stomach contained "insects."

40. *THAMNOPHILUS NÆVIUS* (Gm.).

Several ex., agreeing sufficiently with specimens from Cayenne.

41. *MYRMOTHERULA* — ?

A female of a species allied to *M. surinamensis*.

42. *MYRMOTHERULA* — ?

A single example of a species allied to *M. gularis*. "♂. Irides orange; upper mandible black, lower blue; legs and feet blue."

43. *FORMICIVORA CONSOBRINA*, Sclater, *antea*, p. 279.

Several examples, not in good preservation.

44. *PYRIGLENA PICEA*, Cab. ?

One ex., agreeing with that mentioned in the previous collection (p. 279).

45. *CERCOMACRA TYRANNINA*, Sclater, P. Z. S. 1855, p. 90.

A single male example, agreeing with Bogotan skins.

46. *CERCOMACRA MACULOSA*, Sclater, *antea*, p. 279.

Examples of both sexes.

47. *HYPOCNEMIS NÆVIoidES*, Lafr.

Found "in the underwood."

48. *MYRMECIZA EXSUL*, Sclater, P. Z. S. 1858, p. 540.

Two examples of this bird differ from that described only in being rather more ashy-black on the head and breast. "Irides hazel; bill black; legs and feet blue; naked space round the eyes ultramarine-blue."

49. *FORMICARIUS ANALIS* (Lafr. et D'Orb.).

Two examples, differing from Trinidad skins only in having the head of a darker and more blackish shade. "Irides hazel; bare space round the eyes flesh-colour; bill black; legs and feet brownish; killed on the ground near a cane-patch."

50. *COPURUS LEUCONOTUS*, Lafr. — *C. pæcilonotus*, Cab. in Schomb. Guian. iii. p. 703.

Several ex. "Irides hazel: sitting on a lofty stump in a Cacao plantation."



51. MEGARHYNCHUS CHRYSOGASTER, Sclater, *antea*, p. 281.  
One ex.
52. MYIODYNASTES NOBILIS, Sclater, P. Z. S. 1859, p. 42.  
"Stomach contained insects: irides hazel; bill black; base of lower mandible flesh-colour; legs and feet blue."
53. MYIARCHUS NIGRICEPS, Sclater, *antea*, p. 68.
54. CONTOPUS — ?  
One ex. of a small species allied in structure to *C. virens*.
55. EMPIDONAX — ?  
Two ex. of a distinct species of this group, allied to *E. acadicus*.
56. EMPIDONAX — ?  
One ex.
57. PYROCEPHALUS NANUS, Gould.  
"Not very common."
58. CYCLORHYNCHUS SUBBRUNNEUS, Sclater, *antea*, p. 282.  
One ex.
59. MYIOBIUS ERYTHRURUS, Cab. in Wieg. Archiv. 1847, t. 5.  
f. 1.  
Three ex., apparently to this species.
60. MYIOBIUS BARBATUS (Gm.).  
Two ex., agreeing with those from Babahoyo.
61. PLATYRHYNCHUS ALBIGULARIS, Sclater, P. Z. S. 1860, p. 68.  
One ex. "Found in the dark underwood."
62. TODIROSTRUM SQUAMICRISTATUM, Lafr.  
Two ex.
63. MYIOZETETES COLUMBIANUS, Cab. & Hein. Mus. Hein. ii.  
p. 62.  
One ex., apparently agreeing with this species, if distinct from *M. cayennensis*.
64. ELAINEA — ?  
One ex. of a species allied to *E. placens* of Mexico and Central America.
65. TITYRA PERSONATA, Jard. & Selb. Ill. Orn. i. pl. 24.  
Two ex., agreeing with Mexican specimens. I have also received the same bird from S. Martha and Bogota.

66. *PACHYRHAMPHUS SPODIURUS*, Sclater, *antea*, p. 279.

One ex., agreeing with Babahoyo specimens.

67. *CHIROMACHÆRIS MANACUS* (Linn.).

Three ex.

*NYCTIDROMUS* — ?

Adult and young. "The note of this bird resembles 'Who are you?' said very distinctly and quickly. On moonlight nights it may be heard in all quarters."

69. *PHAËTHORNIS MOORII*, Lawrence.

One ex. ♂. "Feeding about some vines at the height of 5 feet from the ground in the Cacao plantations."

70. *GLAUCIS RUCKERI*.

Three ex. Spec. no. 2577, "irides hazel; upper mandible black, lower yellow with a black tip; legs and feet flesh-colour. Found on the edge of the virgin forest: always solitary, generally in dark and lonely places, and very restless."

71. *HELIOTHRIX PURPUREICEPS*, Gould, Mon. Troch. pt. 17. pl. 9.

Three ex. "Seen flying low at the edges of the forest."

72. *AMAZILIA RIEFFERI* (Boiss.).

Two ex. "When I arrived in October, this species was by no means uncommon, feeding morning and evening round the eaves of the house. In November it was very scarce, and in December not to be seen."

73. *JULIAMYIA TYPICA*, Bp.

Three ex. Spec. no. 2555, "taken catching flies among the vines in the Cacao plantations. In October very common everywhere; in December rare."

74. *JULIAMYIA AMABILIS*.

Two ex. Stomach contained "insects."

75. *CERYLE AMERICANA* (Gm.).

Two ex. Stomachs contained "remains of fishes."

76. *MOMOTUS MICROSTEPHANUS*, Sclater?

Two ex. "A rare bird here."

77. *BUCCO SUBTECTUS*, sp. nov.

*Similis* Bucconi tecto ex Cayenna, sed colore nigro intensiore,

*tetricibus alarum superioribus immaculatis; et vitta pectorali dimidio angustiore.*

Long. tota 5·8, alæ 2·8, caudæ 2·1.

*Hab.* In rep. Equator., regione littorali.

*Mus.* P. L. S.

One ex. "Irides hazel; bill, legs, and feet black."

78. *MALACOPTILA PANAMENSIS*, Lafr. Rev. Zool. 1847, p. 79; Sclater, Mon. Bucc. p. 18.

Several ex. of both sexes. "Irides red; legs and feet bluish flesh-colour. Found in the dry underwood where no weeds grow, flying from branch to branch."

The females are paler, not rufous above, and hardly so on the tail; but of a greenish tinge, and with the breast below much paler.

## II. SCANSORES.

79. *PIAYA NIGRICRISSA*, Sclater, *antea*, p. 285.

"Found in the underwood."

80. *PIAYA RUTILA* (Viell.): Bp. Consp. p. 110.

One example, not differing materially from Eastern specimens. "Three Guava-trees in front of the house were attacked by a number of caterpillars, which in twenty-four hours stripped off their leaves. These insects attracted two specimens of this bird. They were exceedingly active and elegant when hopping or running through the branches; but their flight was heavy and laboured, their short heavy wings being in strong contrast with their long light tail."

81. *CROTOPHAGA SULCIROSTRIS*, Sw.

One ex.

82. *EUBUCCO BOURCIERI* (Lafr.).

"Stomach contained vegetable matter."

83. *CENTURUS PUCHERANII*, Malh.

One ex. "Stomach contained vegetable matter."

84. *CHLORONERPES CECILII*, Malh. ?

One ex. in bad condition, perhaps of this species.

85. *CHLORONERPES CALLONOTUS* (Waterh.).

Two ex. "From small trees near the house."

86. *DRYOCOPUS FUSCIPENNIS*, Sclater, *antea*, p. 286.

Common.

## 87. HERPETOTHERES CACHINNANS (Linn.).

One ex. ♀ by diss. "Crop and stomach full of snakes."

## 88. ACCIPITER PILEATUS (Max.).

One ex. ♂. "Stomach contained feathers."

## 89. COLUMBA SPECIOSA (Gm.).

"Stomach contained minute seeds and vegetable matter."

## 90. PERISTERA — ?

A young bird in bad state, of a species allied to *P. cinerea*.

## 91. ODONTOPHORUS ERYTHROPS, Gould.

One ex. "Stomach contained seeds and vegetable matter. This bird is found in covies in the underwood, and has a cry, which it utters just before daylight and after sunset."

## 92. TINAMUS — ?

"Killed when in company with some domestic chickens in the bush near the house." A small species, allied to *T. parvirostris*: the specimen in bad condition.

## 93. HIATICULA AZARÆ.

## 94. TRINGOIDES MACULARIUS (Linn.), juv.

"Not uncommon on the river's bank."

5. CHARACTERS OF ELEVEN NEW SPECIES OF BIRDS DISCOVERED BY OSBERT SALVIN IN GUATEMALA. BY PHILIP LUTLEY SCLATER, M.A., SECRETARY TO THE SOCIETY; AND OSBERT SALVIN, M.A., F.Z.S.

## 1. POLIOPTILA ALBILORIS.

*Cærulescenti-cinerea, pileo nigro, loris albis: remigibus alarum nigricantibus; primariis cinereo, secundariis albo latiore marginatis: caudæ rectricibus tribus utrinque lateralibus albo, gradatim decrescente, terminatis, ceteris nigris, quarta utrinque extima albo terminata: subtus alba, cinerascente lavata: rostro nigro: pedibus obscure plumbeis.*

Long. tota 4·3, alæ 1·9, caudæ 2·0.

*Hab.* In rep. Guatimalensi in valle fl. Motagua.

*Obs.* Affinis *P. leucogastræ* ex Brasilia, sed loris albis facile notabilis.

## 2. DENDRÆCA CHRYSOPARIA.

*Supra nigra, dorsi plumis ad margines aurescentibus: superciliis et capite toto laterali læte aureo-flavis, vitta angusta per oculos transeunte nigra: alis nigricantibus, albo bifasciatis, secun-*

*darii quoque albido limbatis: cauda nigra, reetricum trium utrinque lateralium pogonio interno partim albo: subtus alba gutture toto et maculis laterum utrinque nigris: rostro pedibusque obscure corneis.*

Long. tota 4·5, alæ 2·5, caudæ 2·4.

*Hab.* In reip. Guatemalensis provincia Veræ Pacis, inter montes.

*Obs.* Inter *D. virentem* et *D. townsendi* media, ab utraque dorso nigro, abdomine pure albo et capite laterali fere omnino aureo distinguenda.

### 3. HYLOPHILUS CINEREICEPS.

*Flavicanti-olivaceus: pileo toto et nucha cinereis: ciliis oculorum et corpore medio subtus albis: lateribus et crisso pallide flavicanti-viridibus, rostro corneo, mandibula inferiore albicante: pedibus plumbeis.*

Long. tota 4·1, alæ 2·1, caudæ 1·8.

*Hab.* In prov. Veræ Pacis regione calida.

*Obs.* Affinis *H. thoracico*, Temminckii, ex Cayenna, sed fronte pileo concolore et pectore albo distinguendus.

### 4. GLYPHORHYNCHUS PECTORALIS.

*Brunneus, secundariis extus, uropygio et cauda rufis: superciliis, lateribus capitis et gula pallide ochraceo-rufis, plumarum marginibus angustis brunneis: subtus dilutior, pectore maculis elongatis, plumarum scapas cingentibus, notato: remigibus nigris, macula magna quadrata in pogonio interiore pallide ochracea occupatis: rostro nigricanti-plumbeo, pedibus nigris.*

Long. tota 5·5, alæ 2·8, caudæ 2·7.

*Hab.* In prov. Veræ Pacis regione calida.

*Obs.* Assimilis *G. cuneato* ex Brasilia, sed statura majore et maculis pectoralibus dignoscendus.

### 5. THAMNISTES ANABATINUS.

*Thamnistes* genus novum ex familia *Formicariidarum*, *Thamno-philo* generi affinis: characteres generales *Thamnophili* habet, sed rostro crassiore, basi latiore, et ptilosi anabatino differt.

*Typus.* *T. anabatinus*.

♂. *Vix olivascenti-brunneus subtus dilutior: cauda ferrugineo-rubra unicolore: alis extus rufescentibus: macula magna interscapulari plumarum basin occupante læte aurantiaco-rubra margine subapicali nigra: superciliari striga indistincta et corpore subtus pallide ochraceis, unicoloribus: rostri mandibula superiore nigricante, inferiore pallide cornea, pedibus nigris.*

♀. *Mari similis, sed macula interscapulii nulla.*

Long. tota 5·6, alæ 2·7, caudæ 2·3, tarsi 7·5.

*Hab.* In prov. Veræ Pacis regione calida.

### 6. PLATYRHYNCHUS CANCROMINUS.

*Platyrrhynchus cancroma*, Sclater, P. Z. S. 1856, p. 295, et Ibis, 1859, p. 445.

*Similis P. caneromæ ex Brasilia, et ab illo vix satis diversus, sed gula pure alba et cauda brevior distinguendus.*

*Hab.* In prov. Veræ Pacis regione calida, et in Mexico Merid. statu Veræ Crucis.

#### 7. TYRANNULUS SEMIFLAVUS.

*Olivaceus: pileo cinerascete: fronte et superciliis albis: alis caudaque fuscis olivaceo limbatis: subtus pure flavus: rostro et pedibus nigris.*

*Long.* tota 3·2, alæ 1·8, caudæ 1·2.

*Hab.* In prov. Veræ Pacis regione calida.

*Obs.* Affinis *Tyrannulo elato* et *T. nigricapillo*, et plerumque eadem forma, sed corpore subtus flavo, maculis alaribus nullis et cauda paulo brevior distinguendus.

#### 8. HETEROPELMA VERÆ-PACIS.

*Olivaceum unicolor, supra infraque ad medium pectus rufo aut ochraceo lavatum: alis caudaque fuscis, extus rufescentibus: rostro corneo pedibus plumbeis.*

*Long.* tota 6·3, alæ 3·5, caudæ 2·5.

*Hab.* In prov. Veræ Pacis regione calida.

*Obs.* Affine *H. virescenti* ex Brasilia et statura eadem; colore *H. turdino* magis appropinquans; attamen ab utroque sane diversum.

#### 9. LIPAUGUS HOLERYTHRUS.

*Rufescenti-brunneus unicolor, subtus clarior: remigum parte interna et primariorum apicibus fuscis: rostri pallide cornei basi albicante: pedibus obscure corylinis.*

*Long.* tota 8·3, alæ 4·2, caudæ 3·8.

*Hab.* In prov. Veræ Pacis regione calida.

*Obs.* Affinis *L. unirufo* ex eadem patria, et pictura eadem, sed crassitie minore facile dignoscendus.

#### 10. PIONUS HÆMATOTIS.

*Viridis: pileo rubiginoso flavo: hujus plumarum marginibus angustis et regione auriculari coccineis: gutture obscure plumbeo: subtus viridis, pectore aureo lavato: lateribus sub alis late coccineis: remigibus nigris, primariis supra fulvo anguste limbatis; secundariis supra et alis omnino subtus cærulescentibus: rectricum basibus intus coccineis, caudæ apice cærulescente: rostro flavescenti-albo, pedibus rubellis.*

*Long.* tota 8·5, alæ 5·8, caudæ 3·6.

*Hab.* In prov. Veræ Pacis regione calida.

*Obs.* Species lateribus coccineis ab aliis hujusce generis speciebus primo visu diversa.

#### 11. CORETHRURA RUBRA.

*Læte rufa, subtus medialiter dilutior: gula albicantior: pileo toto et lateribus capitis saturate cinereis: remigibus et rectri-*

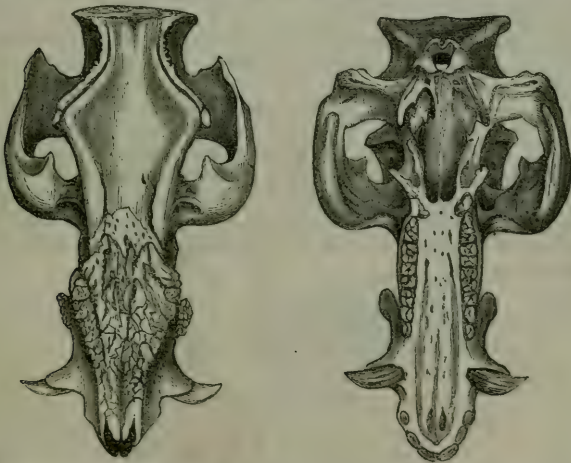
*cibus cum uropygio obscure fusco-nigris : rostro nigro : pedibus olivaceis.*

Long. tota 9·0, alæ 3·25, caudæ 1·7, rostri ab angulo oris 0·8, tarsi 1·3.

*Hab.* In provincia Veræ Pacis.

6. NOTE ON THE SKULL OF THE RED RIVER-HOG (*POTAMOCHÆRUS PENICILLATUS*). BY PHILIP LUTLEY SCLATER, M.A., SECRETARY TO THE SOCIETY.

The present skull of the Red River-Hog (being that of the old male animal, received by the Society from the Cameroons River in 1852, which died during the late severe winter) is of interest, as affording the first opportunity that we have had in this country of examining the dentition of this animal, and ascertaining how far this part of its structure goes to corroborate its generic separation from the true *Sues*, which has been proposed by Dr. Gray, under the name *Potamochoærus*\*. The following notes upon some of the more striking characteristics of the skull of this animal, as observed on comparing it with the skull of an adult male *Sus indicus*, were drawn up by myself and my friend Mr. W. K. Parker.



The dentition of *Potamochoærus* is

Inc.  $\frac{6}{6}$ . Can.  $\frac{1-1}{1-1}$ . Præm.  $\frac{3-3}{3-3}$ . Mol.  $\frac{3-3}{3-3}$ .

The first præmolar is very small, and appears to be lost in early life in the lower jaw. It will be observed that the dentition differs

\* P. Z. S. 1852, p. 131.

from that of the typical *Sus* in the entire absence of the fourth præmolar from each jaw. The great contraction of the lower jaw at the symphysis between the canines and the præmolars is likewise remarkable. The whole skull of *Potamochoerus* is shorter in proportion to its length than that of *Sus*, and more Hippopotamoid. The præmaxillary bones are more expanded. The basis cranii is altogether shorter, so that the pterygoids (which are stronger) nearly reach the tympanics, whereas in *Sus indicus* they are more than half an inch apart. The most noticeable character, however, in the skull of *Potamochoerus* is the great width and strength of the zygomatic arch which (as may be seen by the accompanying woodcuts), turns out suddenly at its anterior part at right angles from the line of the face, and attains its greatest breadth at once, anteriorly to orbits. In *Sus*, on the other hand, it slopes gradually outwards, and reaches its greatest width at the junction of the squamose with the malar. The orbits are proportionately smaller in *Potamochoerus*; and the malar bones are of remarkable size and strength. Looking at the occiputs, the supra-occipital is wider than in *Sus*, and more strongly ridged.

At the middle of the nasal bones in *Potamochoerus*, a rough outstanding ridge projects widely on each side to support the large warty protuberances which adorn the face of the living animal. This ridge is about 2 inches in length, gradually lessening towards the snout, and projects so far as nearly to meet the rough termination of the posterior development of the tusk-process of maxillary, and forms with it a channel for the passage of the orbital nerves and vessels.

Such are some of the leading peculiarities in the skull of this animal which seem fully to justify its separation as a generic or subgeneric form from *Sus*. It is probable that the Southern River-Hog (*Potamochoerus africanus*) possesses the same differential characters, and that the isolation of these two species in structural characters will thus be found to correspond with their geographical position as inhabitants of a distinct zoological region from that tenanted by *Sus*.

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June 12th, 1860.

Dr. J. E. Gray, V.P., in the Chair.

Dr. A. Günther exhibited a dried specimen of a fish of the genus *Centrolophus*, obtained by Mr. J. Couch at Polperro, Cornwall. It had been named by Mr. Couch *Centrolophus morio*, but Dr. Günther regarded it as of a new and distinct species, and proposed to call it *C. britannicus*.



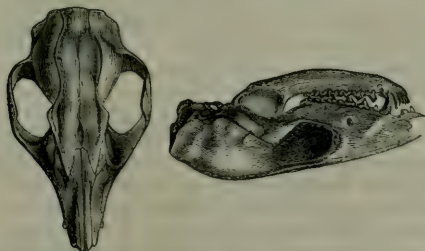
Mr. Selater exhibited a male example of the Bimaculated Duck of Yarrell and other British authors, which was now generally believed to be a hybrid between *Anas boschas* or *Dafila acuta* and *Querquedula crecca*. It was shot when in company with other ducks (*Anas boschas*) on the Beaully Firth, Inverness-shire, in January 1860, by Mr. W. Lantour.

Prof. Macdonald exhibited diagrams illustrative of, and made remarks upon, a new scheme of zoological classification.

The following papers were read:—

1. ADDITIONAL NOTE ON *DIDELPHYS WATERHOUSII*.  
BY ROBERT F. TOMES.

Since the publication, in the 'Proceedings' of the Society, of the description of this species, I have had occasion to study the descriptions of several species of Opossums in the 'Fauna Brasiliens\*' of Prof. Burmeister, and find that he has characterized, under the name of *Gymæomys scapulatus*, an Opossum, which he considers identical with the unnamed species described by Mr. Waterhouse at page 505 of his work on Mammalia. Believing in the identity of the specimen from Ecuador with the one from which Mr. Waterhouse's description was taken, and supposing it to be without a name, I called it, in honour of its first describer, *Didelphys waterhousii*. The question for solution is, whether Prof. Burmeister and myself have referred the same species to this description by Mr. Waterhouse, or whether two distinct species have not been thus confounded by us. In the first instance, my name would have to give way, that of Prof. Burmeister having the precedence by three years; in the latter case,



both names would remain. I submit the following as an explanation:—The specimen from which Mr. Waterhouse described was a male, and we have therefore no precise evidence of the nature of the pouch, although it is placed by him in that section in which the

\* 'Erläuterungen zur Fauna Brasiliens,' &c., in folio, with plates, Berlin, 1856.

pouch is either rudimentary or wholly wanting. Prof. Burmeister places his species in a new genus in which this part is imperfect or absent. The specimen from Mr. Fraser, on the contrary, possesses a complete pouch, in which, according to that gentleman's note, were several young ones. When it came into my hands, this part contained cotton-wool, and was about the size of a large hazel-nut. This, as it appears to me, is quite sufficient evidence of the distinctness of the two species; but the specimen described by Mr. Waterhouse remains doubtful, since we do not know to which to refer it. The accompanying drawings (see woodcut, p. 303) of the skull of *Didelphys waterhousii* will perhaps assist us in making out the relationship of these species.

## 2. DESCRIPTIONS OF TWENTY-TWO NEW SPECIES OF HUMMING-BIRDS. BY JOHN GOULD, F.R.S., ETC.

As my work on the *Trochilidæ* is now fast drawing to a close, I have examined with care and minute detail my entire collection of this great and important family of birds, and I find therein more than twenty species, which, I believe, have not yet received specific appellations. Many of these I have had by me for years, while others have been more recently acquired. Of the specific value of those described in the following pages I am perfectly satisfied; but in case any doubt should be entertained on the subject, my collection is, and will be, at all times accessible for their elucidation.

### GRYPUS SPIXI, Gould.

Crown of the head bronzy-brown; upper surface and all the tail-feathers very rich reddish-bronze; wings reddish purple-brown; line above the eye buff; ear-coverts dark-brown; throat, chest and under surface deep reddish-buff; under tail-coverts bronzy, each slightly tipped with buffy-white; upper mandible black; under mandible yellow, with a black tip; feet yellow.

Total length  $4\frac{7}{8}$  inches; bill  $1\frac{1}{2}$ ; wing  $2\frac{3}{4}$ ; tail  $1\frac{3}{4}$ .

*Hab.* Supposed to be Brazil.

*Remark.*—This bird is considerably smaller than *G. navius*, and has a less cuneate tail. It is possible that this may be one of the sexes of *Glaucis dohrni*; many of its colours would induce such a belief; and if such should prove to be the case, that bird must be removed from the genus *Glaucis* to that of *Grypus*. I have named this bird in honour of the celebrated traveller Spix, in whose work there occurs a figure of a bird (*G. ruficollis*) which somewhat resembles my specimen: not so, however, the accompanying description, which appears to be that of the species so frequently sent from Rio de Janeiro, and which is generally known as *Grypus navius*.

### GLAUCIS MELANURA, Gould.

Centre of the throat, chest, and under surface buff; a streak of dark brown passes downwards from the base of the lower mandible,

between which and the ear-coverts is a stripe of buff; there is also a line of buff behind the eye; crown of the head brown; back of the neck, upper surface, and two middle tail-feathers golden-green; upper tail-coverts narrowly edged with grey; basal portion of the inner webs and the shafts of the four lateral tail-feathers rich reddish-buff approaching to chestnut, the remainder of these feathers being black, tipped with white; bill black, except the base of the under mandible, which is yellow.

Total length  $4\frac{1}{4}$  inches; bill  $1\frac{1}{3}$ ; wing  $1\frac{1}{4}$ ; tail  $2\frac{1}{4}$ .

*Remark.*—This species is much smaller than the *G. hirsuta* of Trinidad and the eastern coast of America. It has also a much greater amount of black colour in its tail; this organ, in fact, when closed and viewed from beneath, appears to be entirely black, the under coverts concealing the buff colouring at its base. I possess two specimens of this bird, one of which, a very fine one, was received from the upper Rio Negro; the other from the Napo.

#### PHAËTHORNIS ZONURA, Gould.

Crown of the head brown; back of the neck, back, and shoulders bronzy-green; rump and upper tail-coverts rich reddish-buff; all the under surface buff, palest on the throat; three outer tail-feathers on each side black at the base, with rich buffy tips; the fourth feather the same except at the tip, where the outer half is buff and the inner half white; the two central prolonged feathers black at the base, largely tipped with white; bill black, except the basal half of the lower mandible, which is either yellow or flesh-colour; feet yellow.

Total length  $3\frac{3}{4}$  inches; bill 1; wing  $1\frac{3}{4}$ ; tail  $1\frac{5}{8}$ .

*Hab.* Peru, where it was procured by M. Warszewicz.

*Remark.*—This is a fine and very distinct species; it is perhaps most nearly allied to *P. griseogularis*; it is, however, a much larger bird, and has its tail much more strongly marked. In fact, the tail must show very conspicuously when outspread, from the strong contrast which the black basal portion offers to the buff tips and the rich rufous colouring of the rump and upper tail-coverts. It belongs to that section of the genus *Phaëthornis* to which Prince Bonaparte has given the subgeneric name of *Pygornis*.

#### AUGASMA SMARAGDINEUM, Gould.

Crown of the head and throat glittering greenish-blue, imperceptibly passing into the glittering green at the breast; back of the neck and upper surface golden-green; upper tail-coverts grass-green; under tail-coverts green inclining to purple on some of the feathers; thighs brown; tail bluish-black, the two outer feathers on each side slightly tipped with white; bill black, with the exception of the basal half of the under mandible, which is flesh-colour.

Total length  $3\frac{3}{4}$  inches; bill  $\frac{7}{8}$ ; wing  $2\frac{1}{8}$ ; tail  $1\frac{3}{8}$ .

*Hab.* Brazil.

*Remark.*—This bird is about the size of *Thalurania furcata*; it is therefore a rather large species; it is also an elegantly formed bird. Those who are acquainted with the *T. chlorocephala* of M. Bourcier

will find in this a very near ally; I have not the least doubt, however, of its being quite distinct. The only examples I have seen are one in my own collection, and another in that of M. Verreaux of Paris. In M. Verreaux's specimen the white tipplings of the outer tail-feathers are nearly obsolete, while in mine they are conspicuous; in my specimen, also, the two middle tail-feathers are marked with green on their upper surface, while in M. Verreaux's these feathers are uniform in colour throughout. My bird was kindly sent to me by T. Reeves, Esq., of Rio de Janeiro.

*EUCEPHALA CÆRULEO-LAVATA*, Gould.

Crown of the head greenish-blue, not very brilliant, but having a few conspicuous small bright-blue feathers intermingled; throat and chest bright greenish-blue, passing into purer green on the flanks; back of the neck, and back, deep grass-green; wings purplish brown; upper tail-coverts bronzy-orange; under tail-coverts bronzy purplish brown; two middle tail-feathers deep purplish bronze; the next on each side is washed with bronze on its outer margin; the remaining feathers purplish-black; thighs greyish-white; the bill appears to have been reddish flesh-colour at the base of both mandibles (this colour also pervades nearly the whole of the under mandible); the remainder of the bill black.

Total length  $3\frac{3}{4}$  inches; bill  $\frac{7}{8}$ ; wing  $2\frac{1}{4}$ ; tail  $1\frac{1}{2}$ .

*Hab.* St. Paulo in Southern Brazil.

*Remark.*—I am indebted to T. Reeves, Esq., of Rio de Janeiro, for a fine specimen of this new bird, which differs so widely from every other known species, that I am unable to compare it with any one of them. It is a stout and rather large bird, with a well-proportioned bill and tail, the latter of which is considerably forked.

I am not quite satisfied that a place in the genus *Eucephala* is the proper position for this bird among the *Trochilidæ*, and I feel that I might, without overstepping the bounds of propriety, have constituted it the type of a new genus.

*EUCEPHALA HYPOCYANEA*, Gould.

Crown of the head, back of the neck, back and flanks somewhat dull-green; throat and chest brilliant blue, passing into glittering green on the centre of the abdomen; wings purplish-brown; upper tail-coverts reddish-bronze; under tail-coverts brownish-black, with bronzy tips; tail steel-black; thighs brown; upper mandible black; basal two-thirds of the under mandible flesh-colour, the apical third black.

Total length  $3\frac{1}{4}$  inches; bill  $\frac{3}{4}$ ; wing 2; tail  $1\frac{2}{3}$ .

*Hab.* Said to be Bahia in Brazil.

*Remark.*—This is a rather small, but distinctly marked species, unallied to any other bird. Lesson's Plate 49 of his 'Histoire Naturelle des Oiseaux Mouches,' appears to have been taken from a bird of this kind; but the term *bicolor* cannot for a moment be entertained.

## ERYTHRONOTA? ELEGANS, Gould.

Crown and all the under surface of the body glittering light-green; back of the neck and back golden- or orange-green; upper tail-coverts purplish-red or puce-colour; tail long, forked, and of a purplish violet-hue with green reflexions on the tips of the two centre feathers; wings purplish brown; tarsi white; under tail-coverts grey with bronzy-purple centres; upper mandible flesh colour at the base, and black for the remainder of its length; under mandible flesh colour, except at the tip, which is black.

Total length  $3\frac{7}{8}$  inches; bill  $1\frac{1}{2}$ ; wing  $2\frac{1}{8}$ ; tail  $\frac{7}{8}$ .

*Hab.* Unknown.

*Remark.*—It is easier to assign a specific name to a bird than to determine to which generic form it is referable; and if there be any bird which is a puzzle to the brain of the ornithologist, this is one. It is a very elegant species, and quite distinct from every other known Humming Bird; in its glittering light-green crown, throat, and chest it looks like a *Chlorostilbon*, but the form of its tail and some other characters ally it to the *Erythronotæ*, with which I have provisionally placed it.

## THAUMATIAS VIRIDICEPS, Gould.

Crown of the head, nape, and sides of the neck glittering light green; back and shoulders bronzy-green; throat and abdomen pure white; flanks white, faintly spotted with yellowish-green; under tail-coverts white; the rather short and narrow tail-feathers purplish-grey, with an obscure band of purplish-brown near the tip of the three outer ones on each side; upper mandible black; under mandible yellowish, except at the extreme tip, which is black.

Total length 4 inches; bill  $\frac{9}{16}$ ; wing  $2\frac{1}{8}$ ; tail  $1\frac{3}{8}$ .

*Hab.* Ecuador.

*Remark.*—Of this somewhat remarkable species I have two specimens, which appear to be male and female. It is a robust bird, being almost as stout in its bill, head, and body as the members of the genus *Cyanomyia*, while its tail is short and the feathers narrow, as in *Thaumatias leucogaster* and *T. chionopectus*.

## THAUMATIAS CÆRULEICEPS, Gould.

Crown of the head and back of the neck deep shining greenish-blue; back and shoulders green, passing into bronzy-green on the rump and upper tail-coverts; tail nearly uniform bronze, with a very faint indication of a zone of brown across the outer feathers near the tip; wings purplish brown; sides of the neck glittering bluish-green, the blue tint predominating on the ear and immediately under the eye; centre of the throat and chest broken glittering green and white; flanks bronzy-green; under tail-coverts grey, with brown centres; upper mandible dark brown; under mandible appears to have been yellow, except at the tip, which is dark brown.

Total length  $3\frac{1}{2}$  inches; bill  $\frac{15}{16}$ ; wing  $2\frac{1}{8}$ ; tail  $\frac{1}{2}$ .

*Hab.* Bogota.

*Remark.*—This species, which is somewhat allied to the *T. milleri*, differs from that, as well as from every other known member of its genus, by the blue colouring of its crown.

#### THAUMATIAS NITIDIFRONS, Gould.

Crown of the head, face, chest, and breast glittering green; abdomen and flanks golden green; back, shoulders, and rump bronzy-green; tail pale bronzy greyish-green, with a zone of purplish-brown crossing the four lateral feathers on each side near their tips; under tail-coverts grey, with a patch of bronzy-green in the centre of each; tarsi greyish-brown; upper mandible black; under mandible yellow, black at the tip.

Total length  $3\frac{1}{4}$  inches; bill  $\frac{3}{4}$ ; wing  $1\frac{7}{8}$ .

*Hab.* Unknown.

*Remark.*—Nearly allied to the *T. brevirostris* and *T. milleri*, but differing from both in the glittering green of the face and crown, and in the centre of the breast being covered with the same shining colour. The specimen described was presented to me by G. N. Lawrence, Esq., when I visited New York in 1858.

#### CHLOROSTILBON MELANORHYNCHUS, Gould.

Bill black; crown of the head and the entire under surface glittering golden-green, the golden hue being most conspicuous on the crown; the back of the neck and upper surface are also golden-green, but less brilliant; wings purplish-brown; the short and slightly forked tail is greenish or steel-blue; thighs brown; anal region, and a small tuft springing from each side of the body, white.

Total length  $3\frac{3}{8}$  inches; bill  $\frac{3}{4}$ ; wing 2; tail  $1\frac{1}{8}$ .

*Hab.* The neighbourhood of Quito in Ecuador.

*Remark.*—Differs from *C. chrysogaster* in its black bill, its shorter and less forked tail, and in its being a stouter or more robust bird.

#### CHLOROSTILBON ACUTICAUDUS, Gould.

Crown and all the under surface glittering green, the green assuming a golden hue on the crown; back, all the upper surface, and tail rich golden-green; wings purplish-brown; bill black.

Total length 3 inches; bill  $\frac{3}{4}$ ; wing  $1\frac{5}{8}$ ; tail 1.

*Hab.* Antioquia in Columbia.

*Remark.*—This very distinct species is allied both to *Chlorostilbon portmanni* and *C. aliciae*; but it differs from the former in the greater length of its bill, and from the latter in the greater length of its tail-feathers. In the present species, the outer tail-feather on each side is prolonged nearly an eighth of an inch beyond the next, which again is a little prolonged beyond the centre feathers. When the tail is closed, the two outer feathers join at the tip, and form a sharp point; in the two species with which I have compared it, the tail is more truncate.

**CHLOROSTILBON OSBERTI, Gould.**

Crown of the head glittering golden-green; throat and all the under surface glittering grass-green; wing purplish-black; tail black, the six centre feathers terminated with a mark of brown, which is more conspicuous in some specimens than in others; in some also the two central feathers are tipped with green; bill coral-red at the base, black at the tip.

Total length  $2\frac{7}{8}$  inches; bill  $\frac{1}{2}$ ; wing  $1\frac{3}{4}$ ; tail  $1\frac{1}{4}$ .

*Hab.* Guatemala.

*Remark.*—This species, which I have named after Mr. Osbert Salvin, and which is an inhabitant of the neighbourhood of Dueñas and some other parts of Guatemala, has been a great puzzle to me, as it must be to every Trochilidist who studies the little green Humming Birds to which the generic name of *Chlorostilbon* has been applied. It is, in fact, a diminutive *C. caniveti*, but too diminutive to be regarded in any other light than in that of a species.

In naming this bird after Mr. Osbert Salvin, I feel that a finer species might have been more appropriately dedicated to him; for there is no person of his youthful age who has exerted himself so praiseworthy or so successfully in collecting facts and specimens of ornithology. Mr. Salvin has already traversed a great part of the country of Central America, and has also paid a hurried visit to North Africa, and collected in both countries an immense mass of materials in every department of zoology, which he has liberally placed at the disposal of those who have devoted themselves to the several departments to which they pertain.

**CALOTHORAX DECORATUS, Gould.**

*Male.*—Crown of the head, all the upper surface and flanks deep grass-green; throat and sides of the neck very lovely shining lilac; chest grey; wings and tail purplish-brown; bill black.

Total length 3 inches; bill  $\frac{3}{4}$ ; wing  $1\frac{3}{8}$ ; tail  $\frac{1}{8}$ .

*Hab.* Supposed to be Antioquia in Columbia.

*Remark.*—This species might easily be mistaken for *Calothorax heliodori*; but although closely allied to that species, it differs from it in several particulars,—in being much larger, in having the frill in front of the throat not so prolonged at the sides (in which respect it more nearly resembles *C. mulsanti*), the two centre tail-feathers finer or more spiny, and the bill much longer. These comparisons have been made with fine specimens in my collection of all three species.

**AMAZILIA ALTICOLA, Gould.**

Crown of the head and back of the neck dark brown, with very slight reflexions of golden-green; back of the neck, back, and rump golden- or orange-green; upper part of the throat, cheeks, and sides of the neck light golden-green; lower part of the throat, chest, centre of the abdomen, thighs, and the thickly clothed tarsi pure white; flanks rich bright buff; under tail-coverts white washed with buff; tail rich deep reddish-buff, the two centre feathers washed with

bronzy-grey, and the four outer ones, on each side, washed on their outer edges with bronzy-green; wings purplish-brown; bill black at the tip, the remainder white or flesh-colour.

Total length 4 inches; bill  $\frac{1.5}{8}$ ; wing  $2\frac{5}{8}$ ; tail  $1\frac{5}{8}$ .

*Hab.* Said to be the Puna district of Peru.

*Remark.*—In its general style of colouring, this bird is very similar to *Amazilia leucophaea*, but, compared with that species, is a giant in size; it has also less of the glittering golden-green on the cheeks and sides of the neck.

I am indebted to M. Bourcier for permission to describe this species.

#### PHLOGOPHILUS HEMILEUCURUS, Gould.

Crown of the head brownish-green; back of the neck, upper surface, two middle tail-feathers, and the flanks grass-green; sides of the face and ear-coverts greenish-brown; centre of the throat, chest, middle of the abdomen, and under tail-coverts white; tail rounded; the four lateral feathers on each side white with an oblique band of black or blackish-purple occupying the centre of each, this band of black extending along the margin of the two outer feathers to the tip, so that the inner web only is white; not so on the next, which is terminated with a large spot or tip of white; upper mandible black; under mandible flesh-colour; feet yellow.

Total length  $3\frac{1}{2}$  inches; bill  $\frac{3}{4}$ ; wing  $2\frac{1}{8}$ ; tail  $1\frac{1}{2}$ .

*Hab.* The borders of the Rio Napo.

*Remark.*—I have no doubt that the bird from which the above description was taken is immature; when the adult is discovered, it will probably be found to be a very remarkable species; in fact, the specimen described exhibits characters differing from those of every other known Humming-bird, among which its singularly-marked, rounded tail is especially noticeable.

#### CALLIPHLOX? IRIDESCENS, Gould.

The whole of the body, including the upper and under tail-coverts, iridescent, pale green and light coppery-red, most brilliant on the throat; the deeply forked tail steely dark-brown, each feather tipped with a more bronzy or purplish hue, which is seen only in certain lights; upper mandible and the tip of the lower one black, the remainder of the latter apparently reddish flesh-colour.

Total length  $3\frac{1}{4}$  inches; bill  $\frac{3}{4}$ ; wing  $1\frac{9}{16}$ ; tail  $1\frac{1}{4}$ .

*Hab.* Rio de Janeiro.

*Remark.*—If, as I believe, I am right in referring this little bird to the genus *Calliphlox*, it is one of the most remarkable Humming-birds that it has fallen to my lot to describe. In its size and form it is very similar to *C. amethystina*, but in colouring it is like a *Chlorostilbon*. The only specimen I have seen was sent to me by T. Reeves, Esq., of Rio de Janeiro.

#### APHANTOCHROA? GULARIS, Gould.

Crown shining grass-green; back of the neck, shoulders, back,



upper tail-coverts, and two centre tail-feathers deep grass-green; under surface of the body grass-green, with the exception of a glittering patch of lilac on the throat and the centre of the abdomen, the thighs, and under tail-coverts, which are white; primaries purplish-brown; four outer tail-feathers, on each side, purplish-green; bill slightly curved and black, with the exception of the base of the under mandible, which appears to have been flesh-colour.

Total length  $4\frac{1}{4}$  inches; bill  $1\frac{1}{8}$ ; wing  $2\frac{3}{8}$ ; tail  $1\frac{1}{4}$ .

*Hab.* My specimens were procured on the banks of the Rio Napo.

*Remark.*—In the general style of its colouring, and in the shortness and similar colouring of its tail, this bird approaches more nearly to *Aphantochroa cirrhochloris* than to any other species; but it differs from that bird in having a much longer bill, and a bright metallic deep lilac patch on the throat, similar to that observed in *Phaiolaima rubinoides*; and in having white under tail-coverts. In size it is somewhat smaller.

#### ERIOCNEMIS SQUAMATA, Gould.

Crown of the head, back of the neck, upper surface, sides of the neck, and flanks coppery-bronze, inclining to green on the back and to rust-colour on the upper tail-coverts; throat, chest, and centre of the abdomen hoary-grey with green and coppery reflexions; in certain lights the feathers of the throat and chest appear to be edged with grey, giving those parts a scaled appearance—hence the specific name; under tail-coverts smoky-grey; anterior portion of the feathers clothing the tarsi white, the posterior portion buff; tail dull steel-black; wings purplish-brown; bill black.

Total length  $4\frac{3}{4}$  inches; bill  $\frac{7}{8}$ ; wing  $2\frac{5}{8}$ ; tail  $1\frac{7}{8}$ .

*Hab.* Ecuador.

*Remark.*—This bird is nearly allied to *Eriocnemis lugens*; but it differs from that bird in its considerably larger size, and in the part-colouring of the tarsi-feathers, in which respect it assimilates to *E. aureliæ*. The three species, indeed, viz. *E. lugens*, *aureliæ*, and *squamata*, constitute a minute section of the genus, and all, I believe, inhabit very high mountains.

#### SCHISTES PERSONATUS, Gould.

Forehead, face, and throat glittering brilliant green, in the form of a mask, posterior to which is a patch of black, below this spring two lengthened tufts of violet-blue feathers, below these tufts a crescentic mark of white; crown of the head, back of the neck, back and shoulders golden-green; tail green, each feather crossed near its apex by a broad band of steel- or bluish-black; abdomen green; wings purplish-brown; bill black.

Total length  $3\frac{1}{2}$  inches; bill  $\frac{7}{8}$ ; wing  $2\frac{3}{8}$ ; tail  $1\frac{3}{8}$ .

*Hab.* Ecuador.

*Remark.*—This species is nearly allied to *Schistes geoffroyi*; but it is a much finer bird, the forehead and throat being covered by a mask of glittering green; its bill is also considerably longer.

THALURANIA TSCHUDII, Gould.

Crown of the head and all the upper surface golden-green, inclining to bronzy-green on the tail-coverts; throat beautiful green; abdomen prussian-blue; under tail-coverts steel-black, many of the feathers slightly fringed with white; thighs, tarsi, and anal region white; tail steel-black.

Total length  $4\frac{1}{4}$  inches; bill 1; wing  $2\frac{1}{4}$ ; tail  $1\frac{3}{4}$ .

*Hab.* The neighbourhood of the River Ucayali, and the countries of Ecuador and Peru.

*Remark.*—The two species to which this bird is most nearly allied are the *T. furcata* and *T. nigrofasciata*; but it differs from the former in having a more robust body and broader tail-feathers, and in having the abdomen prussian-blue instead of ultramarine-blue; and from the latter in the form of the green mark on the throat, which in this bird is truncate, while in *T. nigrofasciata* it descends nearly to a point towards the centre of the abdomen. This is the species mentioned by Tschudi in his 'Fauna Peruana,' under the name of *Trochilus furcatus*,—a fact of which I am certain, as I have received a specimen from his collection direct from Neuchatel.

OREOPYRA LEUCASPIS, Gould.

Crown of the head exceedingly beautiful glittering grass-green; back of the neck, and all the upper surface, deep grass-green, with bronzy reflexions; throat pure white, contrasting conspicuously with the glittering grass-green of the breast; flanks and abdomen greyish-green, with bronzy reflexions; wings purplish-brown; tail forked and steel-black; thighs thickly clothed with hoary or greyish-brown feathers; behind the eye, and extending some distance down the sides of the neck, is a stripe of pure white; bill straight, and both mandibles of a uniform black.

Total length  $4\frac{1}{8}$  inches; bill  $1\frac{5}{8}$ ; wing  $2\frac{1}{2}$ ; tail  $1\frac{5}{8}$ .

*Hab.* The Volcano of Chiriqui in Costa Rica, where it was discovered by M. Warszewicz at an elevation of from 9000 to 10,000 feet.

*Remark.*—One solitary individual, and that badly shot about the tail, is the only example I have ever seen of this remarkable and beautiful bird—a bird which differs so much from every other member of the *Trochilidæ*, that I have been necessitated to make it the type of a new genus.

3. DESCRIPTION OF A NEW SPECIES OF MANAKIN FROM NORTHERN BRAZIL. BY PHILIP LUTLEY SCLATER, M.A., SECRETARY TO THE SOCIETY.

Our Corresponding Member, M. Jules Verreaux, of Paris, has kindly sent to me for examination a specimen of a Manakin lately received by one of his correspondents from Para, which seems to belong to a different species from any heretofore described. Its nearest

ally is certainly *Pipra filicauda* of Spix; but it is readily distinguishable from that and every other member of the group, with which I am acquainted, by the form of the tail-feathers. The outer rectrices are acuminate and produced; the second, third, and succeeding pairs in a less degree than the first; the outer pair exceeding the medial rectrices, which have nearly the ordinary normal form, by nearly half an inch. In *P. filicauda*, as is well known, the rectrices are nearly of equal length, and terminate in a long hair-like filament. Further differences from *Pipra filicauda* are observable in the crimson colour descending lower down the back above, and pervading the breast and upper part of the belly. In the latter respect this species approaches to *P. aureola* and its scarcely separable ally, *P. flavicollis* of the Rio Negro, an example of which was in the same collection.

I propose to call this Manakin

*PIPRA HETERO CERCA*, sp. nov.

*Velutino-nigra: dorso superiore pileoque toto cum nucha coccineis: fronte, ciliis oculorum et corpore subtus flavis, pectore coccineo perfuso: tectricibus subalaribus et macula in pogonio interiore remigum albis: caudæ reatricibus lateralibus elongatis, acuminatis, medias valde excedentibus: rostro plumbeo, pedibus obscure carnis.*

Long. tota 4.25, alæ 2.5, caudæ reatricum lateralium 1.75, medianarum 1.3.

*Hab.* In ripis fl. Amazonum sup.

*Obs.* Affinis *P. filicaudæ* et *P. aureolæ*, sed caudæ forma primo visu distinguenda.

#### 4. DESCRIPTION OF A NEW TYRANT-BIRD OF THE GENUS ELAINEA FROM THE ISLAND OF SAINT THOMAS, WEST INDIES. BY PHILIP LUTLEY SCLATER, M.A., SECRETARY TO THE SOCIETY.

Mr. Osbert Salvin landed at St. Thomas for a few hours on his way out to Guatemala in the spring of last year, and with characteristic energy took out his gun for a ramble. The first shot fired secured two examples of a bird not previously known as an inhabitant of this island\*, and, I believe, new to science,—a species of Tyrant-bird of the genus *Elainea*†. Mr. Riise, so well known for his collections in different branches of Natural History made in this island, having had his attention drawn to the existence of this bird by Mr. A. Newton, caused a search to be made, and obtained six other specimens, which I now exhibit. It is to this gentleman that I propose to dedicate this species, in commemoration of his exertions in confirming Mr. Salvin's discovery, by the name of

\* See Messrs. A. and E. Newton's articles on the Birds of St. Croix and St. Thomas in the 'Ibis,' 1859, pp. 59, 138, 252, 365.

† This genus of Sundeval has been written in many different ways (sc. *Elænia*, *Elainia*, &c.); but the proper orthography is certainly *Elainea*, from *ἐλάϊνος* or *ἐλαϊνεός*, *oleagineus*.

## ELAINEA RIISII, sp. nov.

*Fuscescenti-olivaceus* : pileo cristato intus albo : loris albescens-  
tibus, alis nigricantibus, primariis olivaceo stricte, secundariis  
et tectricibus flavicanti-albo latius marginatis : cauda nigri-  
canti-fusca, marginibus externis olivacescentibus : subtus cine-  
racescenti-albus, abdomine flavido lavato : rostro superiore ob-  
scure corneo, inferiore rubello, pedibus nigris.

	Long. tota.	alæ.	caudæ.
Spec. a, ♂, 5.4		3.0	2.7
— b, ♀, 5.0		2.7	2.2
— c, ? 6.0		3.1	2.8
— d, 6.0		2.9	2.7
— e, 5.7		2.8	2.5
— f, 5.8		3.0	2.8
— g, 5.8		3.0	2.8

*Hab.* In ins. S. Thomæ Antillensium.

*Mus.* P. L. S.

*Obs.* Affinis *Elainæ paganæ* et ejusdem formæ, sed rostro lon-  
giore, compressiore, et corpore subtus pallidiorè distinguenda.

I have specimens of two species of this genus of *Tyrannidæ* in my  
collection from Jamaica. One of them is *E. cottæ* of Gosse; the  
other, as far as I know, undescribed, but quite different from the  
present. I have also an *Elainea* from Tobago, which I cannot refer  
strictly to any known species.

## 5. ON THE AFRICAN TRIONICES WITH HIDDEN FEET (EMYDA). BY DR. J. E. GRAY, F.R.S., V.P.Z.S.

There have been five species of my genus *Emyda*, which MM.  
Duméril and Bibron afterwards most unnecessarily named *Cryptopus*,  
described as found in Africa, viz.—

1. *Cryptopus senegalensis*, Dum. & Bib., from Senegal.
2. *Cyclanosteus petersii*, Gray, from the Gambia.
3. *Cyclanosteus frenatus*, Peters, MSS., from Mozambique.
4. *Cryptopus aubryi*, Duméril, from Gaboon.
5. *Aspidochelys livingstonii*, Gray, from Mozambique.

Now it is very doubtful if several of these names are not synony-  
mous, not because there is any doubt as to the distinctness of  
species, as some neophyte belonging to the Darwinian School might  
suspect, but simply because the materials on which they are founded  
do not afford us sufficient information or means of comparison.

*Cryptopus senegalensis* was described from a very young specimen  
in the Paris Museum before it had any of the sternal callosities de-  
veloped. The specimen of *Trionyx*, with flaps over its feet, which  
we have received from the same locality, is unfortunately in the same  
condition; and though it affords very good evidence that it is desti-  
tute of any bones on the margin of the shield, and therefore does not

belong to the same genus as the Asiatic animal with which M. Duméril associated it, yet it does not give us the means of knowing to which, if to either, of the two African forms, viz. *Cyclanosteus* and *Aspidochelys*, it should be referred.

The description of Duméril, and the colouring of the head, &c. of the specimen in the Museum, show that it must be distinct from *Cyclanosteus frenatus* and from *Cryptopus aubryi* (which may be synonymous), as it has small white dots on its head; while *C. frenatus*, as its name implies, and *C. aubryi*, as its figure shows, are not spotted, and have black lines on the side of the head and neck.

*Cyclanosteus petersii* and *Aspidochelys livingstonii* have been described from shells of adult animals only, without any remains of the bodies attached to them, so that it is not possible to know whether either of them be the adult form of *Emyda senegalensis*, or what is the colouring of their head, which is a very distinctive character in the animals of this family.

*Cyclanosteus frenatus* is known only from a note which Dr. Peters sent home in 1848, shortly after his return from Mozambique.

*Cryptopus aubryi* is well described and figured by M. Duméril in the Rev. Zool. for 1856, p. 374. t. 20, and it appears to be very nearly allied to the shield which I have lately described and figured in the 'Proceedings' of the Society, under the name of *Aspidochelys livingstonii* (*antea*, p. 6); but we cannot be certain that the animal from Gaboon and that from Mozambique are identical, until we know what are the peculiarities of the head of the Mozambique species. I may state that Mr. Cope, in the 'Proceedings of the Academy of Natural Sciences of Philadelphia' for 1859 (p. 295), has formed M. A. Duméril's species into a genus, under the name of *Heptathyra*, in which he evidently intended to include my genus *Aspidochelys*. As his paper was read in 1859 and mine in 1860, his name ought to have priority, unless it may be found desirable, as there is a considerable difference between them in the form of the sternal callosities, to preserve both the names.

The African species known in their adult stage may be arranged thus:—

A. *Sternal callosities 9; hinder pair small.*

1. CYCLANOSTEUS. The hinder pair of callosities very small, and far apart.

*C. petersii*, Gray, Cat. Tortoises, B.M. 65. t. 29. Gambia.

B. *Sternal callosities 7; hinder pair large.*

2. HEPTATHYRA. The hinder pair of callosities rhombic, united together by their whole inner edge.

*H. aubryi*, Dum. Rev. Zool. 1856, 364. t. 20.

Neck with three black streaks, the lateral ones from the eye; occiput with two short black streaks. Gaboon.

see Cope Proc Acad Nat Sci Phila  
 W. S. Peters  
 1859 298

3. **ASPIDOCHELYS.** The hinder pair of callosities oblong, united by their hinder edge only.

*A. livingstonii*, Gray, P. Z. S. 1860, 6. t. 22. River Zambesi.

The only specimen of the Senegal species yet known to me is very young; it does not show the sternal callosities, and has still remains of the umbilical slit. It may be described as follows:—

**EMYDA SENEGALENSIS**, Gray.

*Cryptopus senegalensis*, Dum. & Bibr.

In spirits. Grey; beneath, white. Head above with many symmetrical roundish white spots, and a short white streak in the centre of the crown; upper part of the neck with symmetrical white marbling. Upper shell grey, with small round scattered black spots, with a distinct central keel, which is rather broad and smooth in front, becomes suddenly narrow, and is converted into a series of close tubercles at the middle of the back. Back with rather irregular, often interrupted, somewhat concentric lines of small tubercles, which converge towards the central keel behind, and with a number of larger isolated, but rather crowded, tubercles on the middle of the front edge; sternum blackish, white on the margin.

*Hab.* Senegal.

*Aspidonectes aspidus* Cape Boe

## 6. ON NEW REPTILES AND FISHES FROM MEXICO.

BY DR. ALBERT GÜNTHER.

A collection of Reptiles and Fishes made by one of the correspondents of M. Sallé in Mexico, and purchased for the British Museum, contains, besides many other scarce species—as *Cubina grandis*, Gray, *Gerrhonotus imbricatus* and *tessellatus*, Wiegman, *Geophis (Catoctoma) chalybea*, Wagl. (scales keeled), *Conopsis nasus*, Gthr., *Zamenis mexicanus*, D. & B., *Atropus undulatus*, Jan., &c.,—the following new species.

### SAURIA.

#### MABOUIA BREVIROSTRIS.

*Diagnosis.*—The snout (from the anterior margin of the eye) is a little shorter than the width between the orbits. Twenty-four longitudinal series of scales round the middle of the trunk, two entire and two half series along the back between the white streaks. Two large anal shields in front of the vent, with a small additional one on each side. A series of large shields along the lower part of the tail. Back brown, separated from the sides, which are black, by a white streak, running from the snout, above the eye, to the origin of the tail, where it is gradually lost. Another streak, less distinct, borders the lower lip, and the black coloration of the side. Belly whitish, the centre of each scale being minutely dotted with greyish.

*Hab.* Oaxaca (Mexico).

The general arrangement of the shields of the head being the same as in *Mabouia agilis*, it does not appear necessary to give a detailed description of them. The present species is very similar to the latter, but distinguished by a considerably shorter snout. The large scales on the back and the large anal shields are sufficient characters to distinguish it from *M. lacepedii*, &c.

## OPHIDIA.

### LEPTODEIRA DISCOLOR.

*Diagnosis*.—Anal bifid; scales in nineteen rows. Posterior maxillary tooth longest and strongest, in a continuous series with the other teeth, not grooved. Dirty-white, with numerous black cross-bands extending on to the ventral plates; belly uniform whitish.

*Hab.* Oaxaca (Mexico).

*Description*.—The head is rather broad and depressed, the snout rounded; the eye is of moderate size, its vertical diameter being about one-third the width between the eyes; the trunk is rounded, and, like the tail, somewhat slender. The rostral shield reaches just to the upper surface of the snout; the frontals are nearly square: the anterior pair are one-third the size of the posterior, which are slightly bent downwards to the side of the head; the vertical is pentagonal, longer than broad; the occipitals rounded posteriorly. Nostril situated between two nasals; loreal quadrangular; one anterior and two posterior oculars; seven or eight upper labial shields, the third and fourth or the fourth and fifth entering the orbit. There is one elongate temporal shield in contact with both the oculars; the other temporals, five in number, are scale-like. The medial lower labial is triangular and rather small; nine lower labials, the first of which is in contact with its fellow behind the median shield. There are two pairs of chin-shields, of nearly equal size. The scales are in nineteen rows, smooth, rhombic, those of the sides similar to those on the back. The number of the ventral plates varies between 182 and 179, that of the caudal between 88 and 87.

The ground-colour of the upper parts is dirty-white: the upper part of the head is brown; there is a whitish collar behind the occipitals. Fifty-one or fifty-four black bands cross the trunk and extend on to the edge of the belly; they are broader than the interspaces between, and become interrupted and spot-like on the tail. All the lower parts are uniform whitish.

	in.	lin.
Total length . . . . .	21	1
Length of the head . . . . .	0	7
Greatest width of the head . . . . .	0	5 $\frac{1}{3}$
Length of the trunk . . . . .	14	6
— of the tail . . . . .	6	0

This species might be easily taken for a variety of *Leptodeira annulata* or *Leptodeira torquata*\*, exhibiting nearly the same physiognomy, and externally differing only in its more slender body,

\* Ann. & Mag. Nat. Hist. March 1860, p.169, pl. x. fig. A.

fewer scales, and somewhat modified coloration. Nevertheless, we should be obliged to refer these snakes to different genera, if we were to adopt the dentition as the chief systematic principle: namely, *L. annulata* to *Dipsas*, *L. torquata* to *Liophis*, and *L. discolor* to *Coronella*.

## PISCES.

## CHROMIS NEBULIFERA, sp. nov.

D.  $\frac{13}{12}$ . A.  $\frac{6}{9}$ . V. 1/5. L. lat. 35. L. transv. 6/13.

Mouth narrow, protractile; teeth of the jaws cardiform, in a short band, those of the outer series larger, somewhat compressed, brown at the tip; palate smooth. Opercles scaly; præopercular margin entire. Nostril simple.

The height of the body is contained three times and one-half in the total length, the length of the head four times and two-thirds. The interorbital space is convex, and its width rather more than the diameter of the eye, which is one-half the length of the snout. There are six series of small scales between the præorbital and the angle of the præoperculum. The dorsal fin and the lateral line commence on the same vertical; caudal truncated; the commencement of the anal falls vertically below the sixteenth dorsal spine; the ventral is inserted behind the pectoral, and extends on to the vent. Greenish, the middle of the body clouded with blackish, in form of indistinct vertical bands; a round black spot at the root of the caudal; the outer parts of the fins blackish.

This species would be placed in the genus *Heros* of Heckel.

*Hab.* Fresh waters of Mexico.

	in.	lin.
Total length . . . . .	7	0
Height of the body . . . . .	2	0
Length of the head . . . . .	1	6
Diameter of the eye . . . . .	0	$3\frac{1}{2}$

## CHROMIS FENESTRATA, n. sp.

D.  $\frac{17}{12}$ . A.  $\frac{6}{9}$ . V. 1/5. L. lat. 33. L. transv. 6/13.

Mouth narrow, protractile; teeth of the jaws cardiform, in a short band; those of the outer series larger, somewhat compressed, brown at the tip; palate smooth. Opercles scaly; præopercular margin entire. Nostril simple.

The height of the body is contained two and three-fifth times in the total length; the length of the head four times. The interorbital space is convex, and its width more than the diameter of the eye, which is one-half the length of the snout. There are five series of scales between the præorbital and the angle of the præoperculum. The dorsal fin and the lateral line commence on the same vertical; caudal truncated; the commencement of the anal falls vertically below the fifteenth dorsal spine; the ventral is inserted behind the



pectoral and extends on to the anal. Blackish-green, with six black vertical bands, crossing a deep black longitudinal band, which runs from above the pectoral to the root of the caudal. Vertical and ventral fins blackish, darkest at the base and margins.

This species would be placed in the genus *Heros* of Heckel.

*Hab.* Río de la Lana (Mexico).

	in.	lin.
Total length . . . . .	3	8
Length of the head . . . . .	0	11
Height of the body . . . . .	1	5
Diameter of the eye . . . . .	0	2½

#### TETRAGONOPTERUS ÆNEUS.

D. 11. A. 26. V. 8. L. lat. 35. L. transv. 7/6.

The height of the body is contained three times or three and a half times in the total length, and the length of the head four and four-fifths times. The interorbital space is convex, and its width more than the diameter of the eye, which equals nearly the extent of the snout. Uniform bronze-coloured, with a brownish spot at the root of the caudal.

*Hab.* Fresh waters of Oaxaca (Mexico).

	in.	lin.
Total length . . . . .	3	5
Height of the body . . . . .	1	1
Length of the head . . . . .	0	8½
Diameter of the eye . . . . .	0	2¼

#### 7. DESCRIPTIONS OF NEW SHELLS FROM THE COLLECTION OF HUGH CUMING, ESQ. BY TEMPLE PRIME, OF NEW YORK.

1. *BATISSA UNIONIFORMIS*, Prime. *B. testa ovato-orbiculari, subæquilaterali, elongata, fortis, intus violacea, epidermide brunnea vestita, sulcis remotis, umbonibus depressis, erosis, antice inclinatis; dentibus cardinalibus crassis; lateralibus angustis, regulariter serrulatis.*

Long. 4½, lat. 3, diam. 1<sup>9</sup>/<sub>10</sub>, poll.

*Hab.* — ?

2. *BATISSA GRACILIS*, Prime. *B. testa ovato-subrhomboidea, depressa, lævi, inæquilaterali, epidermide virescente vestita, transversim irregulariter sulcata; umbonibus tumidis, erosis; valvis intus ad margines violaceis; cardine angusto; dentibus cardinalibus inæqualibus; lateralibus elongatis.*

Long. 3, lat. 2½, diam. 2½, poll.

*Hab.* — ?

3. *BATISSA FUSCATA*, Prime. *B. testa ovato-trigona, oblonga, inæquilaterali, in medio tumida, transversim regulariter striata,*

*epidermide polita, nigro-virescente vestita; umbonibus tumidis; intus cærulea; cardine angusto, obliquo, inæqualiter tridentato; dentibus cardinalibus simplicibus; lateralibus angustis.*

Long. 3, lat.  $2\frac{3}{4}$ , diam.  $1\frac{1}{2}$ , poll.

Hab. — ?

4. **BATISSA COMPRESSA**, Prime. *B. testa ovato-orbiculari, tumida, compressa, subæquilaterali, intus violacea, epidermide polita, atro-virescente vestita; umbonibus erosis, dentibus cardinalibus subæqualibus, lateralibus elongatis, serrulatis.*

Long.  $2\frac{2}{3}$ , lat.  $2\frac{1}{2}$ , diam.  $1\frac{1}{10}$ , poll.

Hab. Borneo.

5. **BATISSA INFLATA**, Prime. *B. testa magna, orbiculari, inæquilaterali, crassa, solida, obtusa, epidermide rugosa, fusco-nigrescente vestita; umbonibus productis, erosis, obliquis; valvis intus albis et violaceis; dentibus cardinalibus crassis, subæqualibus; lateralibus angustis.*

Long.  $3\frac{1}{3}$ , lat.  $3\frac{1}{4}$ , diam.  $2\frac{1}{4}$ , poll.

Hab. Nicobar.

6. **BATISSA MINOR**, Prime. *B. testa parva, tenui, suborbiculari, valde obliqua, subæquilaterali, depressiuscula, transversim regulariter striata, epidermide polita, virescente vestita, intus violacea; dentibus cardinalibus tribus, inæqualibus, brevibus subcanaliculatis; lateralibus elongatis, regulariter et tenuiter serrulatis.*

Long.  $1\frac{9}{10}$ , lat.  $2\frac{2}{10}$ , diam.  $\frac{1}{2}$ , poll.

Hab. Feejee Islands.

7. **BATISSA FORTIS**, Prime. *B. testa orbiculari, oblique inæquilaterali, tumida, crassa, intus violacea, epidermide nigro-virescente vestita, umbonibus prominentibus, erosis, antice inclinatis, dentibus cardinalibus crassis, subæquilateralibus; lateralibus angustis, brevibus.*

Long.  $2\frac{9}{10}$ , lat.  $2\frac{1}{2}$ , diam.  $1\frac{2}{5}$ , poll.

Hab. New Caledonia.

8. **BATISSA ELONGATA**, Prime. *B. testa orbiculato-trigona, inflata, subcordiformi, inæquilaterali; epidermide fusca vestita; umbonibus tumidis, erosis; valvis solidis, intus albis; dentibus cardinalibus inæqualibus, prominentibus, duobus bifidis; dentibus lateralibus brevibus.*

Long.  $3\frac{1}{4}$ , lat.  $2\frac{1}{2}$ , diam.  $1\frac{1}{2}$ , poll.

Hab. New Caledonia.

9. **CYRENA FLAVA**, Prime. *C. testa orbiculato-trigona, depressiuscula, transversim inæqualiter striata, inæquilaterali, epidermide luteo-flavescente vestita, valvis crassis, solidis, intus candidissimis; umbonibus parvis, obliquis, erosis; cardine an-*

*gusto, inæqualiter tridentato; dente laterali postico compresso, antico brevior acuto.*

Long.  $1\frac{7}{10}$ , lat.  $1\frac{1}{2}$ , diam.  $\frac{9}{10}$ , poll.

Hab. — ?

10. CYRENA BRUNNEA, Prime. *C. testa orbiculato-subtrigona, subinflata, subæquilaterali, transversim tenuiter et regulariter striata, epidermide fuscescente vestita, valvis crassis, solidis; intus candidissima; latere antico producto, latere postico truncato; cardine angusto; dentibus cardinalibus subæqualibus; lateralibus subæqualibus, antico paulo crassiore.*

Long.  $1\frac{9}{10}$ , lat.  $1\frac{4}{5}$ , diam. 1, poll.

Hab. — ?

11. CYRENA OBSCURA, Prime. *C. testa trigona, inflata, cordiformi, solidissima, alta, tumida, inæquilaterali, transversim striata, epidermide fuscata vestita, intus alba; umbonibus prominentibus, erosis; cardine angusto; dentibus cardinalibus tribus inæqualibus; lateralibus magnis, antico majore, acuto.*

Long.  $1\frac{9}{10}$ , lat.  $1\frac{7}{10}$ , diam.  $1\frac{5}{10}$ , poll.

Hab. New Granada.

12. CORBICULA MAXIMA, Prime. *C. testa maxima, orbiculato-trigona, solida, tumida, inæquilaterali, compressa, transversim tenuissime et regulariter striata; epidermide flavescente, nitidissima, intus alba; umbonibus parvis, acutis; dentibus cardinalibus inæqualibus, divaricatis; lateralibus elongatis, angustis, subæqualibus, arcuatis, tenuissime serrulatis.*

Long.  $1\frac{9}{10}$ , lat.  $1\frac{3}{4}$ , diam. 1, poll.

Hab. — ?

<sup>54</sup>  
13. CORBICULA OVALIS, Prime. *C. testa æquilaterali, tumidula, epidermide fuscescente vestita, transversim regulariter striata; intus violacea; umbonibus prominentibus, violaceo subradiatis; cardine incrassato, inæqualiter tridentato; dentibus lateralibus crassis, prælongis, tenuissime striatis.*

Long. 1, lat.  $\frac{5}{10}$ , diam.  $\frac{5}{10}$ , poll.

Hab. — ?

14. CORBICULA CYRENIFORMIS, Prime. *C. testa trigona, æquilaterali, subcordiformi, inflata, tumida, crassa, fortissima, intus violacea, epidermide fuscescente vestita, transversim regulariter striata, rugosa; umbonibus tumidis, erosis, obliquis, dentibus cardinalibus fortibus inæqualibus, lateralibus subæqualibus, striatis.*

Long.  $1\frac{3}{10}$ , lat.  $1\frac{3}{10}$ , diam.  $\frac{7}{10}$ , poll.

Hab. — ?

15. CORBICULA REGULARIS, Prime. *C. testa ovato-transversa, æquilaterali, intus violacea, epidermide viridi-flavescente; um-*

*bonibus disparibus; dentibus cardinalibus tribus, inæqualibus, lateralibus prælongis, striatis.*

Long.  $\frac{9}{10}$ , lat.  $\frac{7}{10}$ , diam.  $\frac{4}{10}$ , poll.

Hab. Deccan, India.

16. CORBICULA TENUSTRIATA, Prime. *C. testa trigona, æquilaterali, alta, tumidula, lævissima; epidermide flavescente nitidissima, transversim regulariter striata; intus alba; umbonibus prominentibus erosis; cardine angusto, tridentato; dentibus lateralibus angustissimis, elongatis, tenuissime serrulatis.*

Long.  $\frac{7}{10}$ , lat.  $\frac{6}{10}$ , diam.  $\frac{4}{10}$ , poll.

Hab. — ?

17. SPHÆRIUM INCONSPICUUM, Prime. *S. testa ovato-subrhomboidea, compressa, lævi, fragili, subinæquilaterali, epidermide nitida lutescente vestita, transversim tenuiter et lævissime striata; umbonibus parvis, tumidis; dentibus cardinalibus minimis, lateralibus elongatis.*

Long.  $\frac{4}{10}$ , lat.  $\frac{3}{10}$ , diam.  $\frac{1}{10}$ , poll.

Hab. Lycia.

18. SPHÆRIUM SUBTRANSVERSUM, Prime. *S. testa ovato-oblonga, æquilaterali, tenui, fragili, parva, compressa, epidermide flavescente vestita, umbonibus magnis haud tumidis.*

Long.  $\frac{3}{10}$ , lat.  $\frac{2}{10}$ , diam.  $\frac{1}{10}$ , poll.

Hab. Tobasco.

19. PIDIDIUM RETUSUM, Prime. *P. testa minuta, ovato-subrhomboidea, complanata, inæquilaterali, tumida, postice rotundata, tenuiter striata, epidermide corneo-flavescente vestita; umbonibus tumidis.*

Hab. Honduras.

20. PIDIDIUM ANGULATUM, Prime. *P. testa minuta, elongata, ovato-orbiculari, inæquilaterali postice subtruncata, epidermide corneo-flavescente vestita, tenuissime striata, umbonibus parvis, tumidis.*

Hab. Valparaiso.

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June 26th, 1860.

Mr. E. W. H. Holdsworth, in the Chair.

Mr. Leadbeater exhibited some heads of the American Wapiti Stag (*Cervus canadensis*) of which the antlers were of remarkable size and strength—one of the heads weighing over 32 lbs., and three specimens of Buffon's Skua (*Lestris cephus*), in fine plumage, lately obtained on the coast of Ireland.

Mr. Sclater exhibited a drawing of a species of Rock-Kangaroo, just received by the Society from South Australia. It was obtained by Mr. J. R. Bennett, the importer, from Mount Searle, about 400 miles north of Adelaide. It appeared to be referable to *Petrogale xanthopus* of Dr. Gray (P. Z. S. 1854, p. 249. pl. xxxix.), but did not quite agree with Mr. Gould's figure of the same animal given in the 'Mammals of Australia,' being more distinctly banded on the tail, and the white markings not reaching the neck as there represented, besides minor differences.

Mr. Sclater remarked that the Society had eleven species of *Macropodidæ* now living in the Gardens, namely:—

- |                                   |                                    |
|-----------------------------------|------------------------------------|
| 1. <i>Macropus giganteus</i> .    | 7. <i>Halmaturus billardieri</i> . |
| 2. — <i>fuliginosus</i> .         | 8. <i>Petrogale penicillata</i> .  |
| 3. <i>Osphranter rufus</i> .      | 9. — <i>xanthopus</i> .            |
| 4. <i>Halmaturus ruficollis</i> . | 10. <i>Bettongia cuniculus</i> .   |
| 5. — <i>bennettii</i> .           | 11. — <i>penicillata</i> .         |
| 6. — <i>thetidis</i> .            |                                    |

Of these, *M. bennettii*, *ruficollis*, and *thetidis* had during these last three years bred abundantly under the Society's care.

The following papers were read:—

1. NOTES ON THE HABITS OF THE BROWN COATI (*NASUA FUSCA*, DESM.). BY GEORGE BENNETT, M.D., F.Z.S., ETC.

A full-grown living specimen of this interesting Plantigrade animal, a native of Tropical South America, was presented to me in Sydney, N. S. Wales, by the commander of a ship, who had procured it from the coast of South America, and had had it in captivity for eleven months. It was the size of a very large cat, with hair of greyish-brown colour over the back and sides, the tail long, bushy, and of a dark brown colour, and the ears round. The colour seems to vary according to age. There are two species at present known, the *Nasua rufa* and the one under notice, which I consider the largest. This animal bears some affinity to the Racoon, but is distinguished by having an elongated, truncated, and moveable snout, with which it roots up the earth in search of worms and grubs. The jaws are armed with sharp teeth, and the under jaw is shorter than the upper. It preys upon small quadrupeds and birds. It climbs trees in search of prey, and also as frequently seeks its food upon the ground.

The possession of this living specimen enabled me to observe its habits, and, as it was permitted to roam about at liberty, its natural actions could be better observed than when the animal is kept in confinement. It would come when called, like a dog, evincing much attachment, and always seemed gratified when patted or otherwise caressed, more especially when rubbed behind the ears, displaying during the operation as much delight as a cat under similar treatment, crouching down, placing the head with the nose close to the ground, uttering at the same time a subdued sharp, whistling cry. If placed in confinement, it would run round the cage, rapidly biting at its

tail during its circular movements ; and on any person approaching the cage, would spit, growl, and utter loud, sharp, and discordant cries. The instant, however, it was set at liberty it permitted itself to be fondled even by strangers. One of its habits was very peculiar : it would take glue or any adhesive substance, if in its way, and rub some over its tail, and soon after amuse itself by licking it off, or endeavouring to remove it by washing its tail in water. It was very fond of sucking the blood of animals, and, when these were placed before it dead, always selected the part in which the blood had been retained in the greatest quantity before any other portion of its prey. I have also frequently seen it eat the fruit of the Moreton Bay fig-tree, running about under the tree, and, after selecting the ripest that had fallen, opening them and sucking out the pulp. One morning I observed it commence a meal upon a rat which had just been killed and given to it. The first process on receiving the prey was, as usual, to suck all the blood from those parts in which it found any had been retained ; it then began rolling the rat upon the ground with its fore paws, but for what purpose this operation was performed I could not ascertain. After the prey had been treated in this manner for some time, it pulled out the intestines and devoured some portion of them before eating any other of the fleshy part. On approaching the animal at this time, it would dart away with the prey, uttering shrill cries, and was exceedingly savage if any attempt was made to take it away. When running about in the garden, it would insert its long, flexible snout into the earth, root it up, and seemed to be eagerly devouring worms or any similar food it found there. It evidently possessed an acute sense of smell, for after smelling about for some time it would insert the snout to some depth into the earth in the selected place, and secure the worm or grub which it had been seeking.

2. ABSTRACT OF NOTES ON THE OSTEOLOGY OF *BALÆNICEPS* REX. BY W. K. PARKER, MEMB. MICR. SOC.\*

The first view of the living *Balæniceps* at once suggests the idea of the Boatbill (*Cancroma*), the Heron (*Ardea*), and the Adjutant (*Leptoptilus*). Other large-headed birds occur to the mind on a longer observation, for one instinctively thinks of the Pelican (*Pelecanus*), the Toucan (*Ramphastos*), the Hornbill (*Buceros*), and the *Podargus*, although these birds belong to distinct and very remotely related groups. Nor does the internal structure of this noble, but strange and weird-looking bird, contradict the first external impressions ; for the very unusual size of the head, and its great strength, require certain modifications of a teleological character, such as occur in the large-jawed species of other widely separated groups. The difference in the structure of the skeleton between the *Balæniceps* and its small New World relative, the *Cancroma cochlearia*, is

\* This paper will be printed entire in the 'Transactions,' accompanied by illustrative plates.

greatly exaggerated by the necessary modification of the bones in the giant species, by their thickness, and by the size of the ridges and out-standing processes for muscular attachment; but the two birds are, nevertheless, near allies. In the skull, especially, is this difference exhibited; and any large bird may differ osteologically from its small relations from this cause, much more than from any necessary specific or generic distinction of character.

Again, any peculiarity of habit in an aberrant species, or genus, will make, as it were, large demands upon the structure of those parts or organs which are subservient to this (as it regards the group or family) eccentric mode of life. The Secretary-bird (*Serpentarius*) amongst the Vultures, the Spoonbill (*Platalea*) and the Oystercatcher (*Hæmatopus*), the Pelican and the Scissors-bill (*Rhynchops*), each form so different from its relations, are familiar instances of this law.

Perhaps we ought to expect the skull of a bird to be the seat of more extensive teleological modifications than any other part of the skeleton, seeing that it must perform such varied duties, learn so many trades, and be the servant and caterer to the whole body; whilst the hands, which in some of the higher mammals minister to the necessities of the creature, are here necessarily restricted to one or two functions. If a rule like this could be clearly made out, it would go far towards settling many a disputed point of relationship; the Hornbills and the Kingfishers would not then startle the student of the Insectores; and the Flamingo (*Phœnicopterus*), notwithstanding its lamelloirostral character, might be allowed to stalk amongst the Herons.

The broad expanded occiput of the *Balæniceps* differs but little from that of the Adjutant; but the upper surface of the skull, instead of being generally rough and convex, as in the latter bird, is smooth, flat, and even concave at its anterior half. In the *Balæniceps*, as in the Heron and Boatbill, the large eye-ball has elevated the upper orbital margin above the level of the mesial part of the skull, whilst in the Adjutant that margin is some distance below. Moreover, the skull of the *Balæniceps* is very short as compared with that of the Adjutant, and in density and polish of the bone is more like that of the great Maccaws (*Ara*); its transverse hinge too, with the upper jaw-bone, is more like that of these birds than that of its own congeners. There is no bony bridge over the temporal fossæ in this bird, in which respect it agrees with the Heron and Boatbill, and differs from the Adjutant. The eye-ball being very large and the skull very short, the anterior orbital margin is one-third of an inch in front of the great transverse hinge; whilst in the Adjutant, and even in the Heron, it is half an inch behind that hinge. This modification has caused a displacement of the lacrymal bones, which, although they form the anterior boundary of the orbit, as in other birds, are in front of the great hinge, instead of behind it. The nostrils are high up on the jaws, two-thirds of an inch in front of the hinge, and more than one inch apart; at their anterior end they are continuous with the deep submesial grooves that mark out the strong bony ridge

of the upper jaw, and pass forwards to mark the boundary of the great terminal beak. On the mid-line, a little behind the nasal fossæ and in front of the hinge, the upper jaw-bone rises into a rough boss.

Now in most birds the highest part of the upper jaw is between the nasal fossæ, and not behind, as in the *Balaniceps*. This character, with the backward extension of the jaw, the shortness of the frontals, and the very forward position of the enormous well-margined orbits, helps to give a solemn, wise, but somewhat sinister aspect to the bird. Looking at him in his paddock, the first impression is that we have before us some strangely ancient form with "the breath of life" in it, and "standing upon its feet," concerning which geology had taught us that "its bones were dried up, and its hope lost."

The marginal outline of the great upper jaw of the *Balaniceps* much resembles that of the leaf of *Magnolia grandiflora*. Its length is more than twice its breadth; whilst in the Boatbill the breadth is more than half the length, the upper jaw of the latter being more outspread. The degree of arching of the upper jaw is intermediate between that of the Boatbill and that of the Stork (*Ciconia*). The gradual rise of the mesial ridge to form the great terminal hook, the crescentic notch forming the inferior margin of that beak, and then the graceful outward curve of nearly the entire mandibular margin, give great elegance to the lateral aspect of the upper jaw. At the end of that margin we have the commencement of the great cheek-bone, which is nearly two inches long, half an inch broad, and one-quarter of an inch thick.

Such a magnitude of the zygomatic arch as this is perfectly unique in the class of Birds, being more like the development of the same part in most Mammalia, in the Crocodiles, and in the Turtles. In the enormous heads of the larger Hornbills, the cheek-bones are not half the size they attain in the *Balaniceps*.

The os quadratum, or tympanic bone, which forms so beautiful an articular medium between the cranium and lower jaw in birds, is strong and well-developed. This bone and the little pterygoid, which intervenes between it and the palatines, have very much the character of the same bones in the Heron and the Adjutant; but the palatine bones themselves, coalescing at the mid-line, and sending downwards a strong keel at that part, are exactly intermediate in structure between those of the Adjutant and Pelican. These bones and the pterygoid at their point of junction are beautifully scooped out to receive and glide under the strong beam of bone which forms the base of the interorbital septum.

The great strength of all the bones forming the upper maxillary apparatus is in perfect harmony with what is known of the habits of the creature. In this respect it has no peer amongst its congeners, and no superior except amongst some of the larger Parrots. But the latter birds, although they possess the most perfect fronto-maxillary hinge, have nothing in their tympanics, or malar bones, at all comparable to those of the *Balaniceps*. Perhaps the most elegant part of this bird's structure is the hard palate, formed for the most part by the coalesced premaxillary bones; the maxillaries in birds, as in typical



fish, having a very backward position and often inferior development. The mid-line of this highly arched hard palate is occupied by a partially open canal for a large venous sinus, which receives on either side numerous vein-grooves at right angles. This gives a beautiful leaf-like appearance to this structure.

Just inside the margin of the posterior angle on the under surface of this great upper jaw the bone is cut away, as it were, to receive the coronoid portion of the lower jaw. This excavated part is continuous anteriorly with a deep groove, margined internally by a sharp ridge, which gradually rises inside the palate to pass forwards in a sigmoid manner to the base of the great terminal beak, where it meets the submesial groove on the upper surface of the jaws. In the Common Heron these palatine submarginal lines exist, being covered in the horny sheath by sharp ridges. These ridges have their fullest development in the Green Turtle. The occipital condyle is hemispherical and large; and the base of the skull has a very exquisite structure, which deserves full description, as it exceeds anything we have seen in birds, the Heron making the nearest approach to the *Balaniceps* in this particular. Many other birds, however, show traces of this peculiar structure. The lower jaw is exceedingly strong and thick, as compared with that of the Adjutant. Less elliptical and more triangular than that of the Boatbill, it has, nevertheless, many of the characters of the latter. Its tip is curiously emarginate, as is also the tip of the upper jaw—the bony basis of the great hooked beak. The traces of suture between the dentary and other elements of the mandible, which are persistent in the Boatbill, Adjutant, and most other birds, are all filled up with bony matter, as is the case in the Parrot tribe, in the Hornbills, and in the Toucans. The anterior part of the mandible passes within the maxilla, the edge of its horny sheath fitting between the marginal and submarginal ridges of the latter. Where the upper jaw begins to narrow towards its angle, there the mandible rises high (its height or depth here being  $1\frac{1}{3}$  inch), and it is rounded, rough, and strong. It then lowers again, and becomes rapidly broader, to form the deep and wide articular cavities for the tympanic bone above, and the broad flat angular processes behind and below.

Each ramus of this great *inelastic* mandible is united to its fellow at the symphysis by complete bony union to the extent of  $1\frac{1}{3}$  inch. In the extremely *elastic* mandible of the Pelican this line of bony union is one-eighth of an inch in length, in the Boatbill one-fourth of an inch, in the Adjutant  $4\frac{1}{2}$  inches, and in the Hornbill, *Buceros bicornis*, more than 7 inches.

In the Boatbill and Grey Heron there are twenty-three separate vertebræ between the head and the pelvis; in *Balaniceps rex* and the Adjutant twenty-one, and in the White Stork twenty.

In the Boatbill there are nine pairs of free ribs. The last, or pelvic, does not reach the sternum, nor do the first four, so that there are four true dorsal ribs. In the Heron there are eight pairs; the anterior three and the last (which is pelvic) do not reach the sternum,—here there are only four true dorsals. The *Balaniceps*, the White

Stork, and the Adjutant have each seven pairs of free ribs, the last five reaching the sternum; in *Balæniceps* and the Adjutant the last pair are pelvic; in the White Stork the last two pairs. Until the birds are adult, the anterior vertebræ of the pelvis are but partly united. In the Storks, Herons, Boatbill, and *Balæniceps* the dorsal vertebræ continue distinct throughout life; but in many of the Cranes the tendons of the dorsal muscles are ossified, and fasten the bones more or less together, and two or three contiguous centra coalesce. Among the cervical vertebræ of the true Herons and their nearest allies, *e. g.* *Ardea*, *Botaurus*, *Cancroma*, and *Balæniceps*, there are several which have elegant bridges under their upper or cranial end for the carotid arteries, which bony bridges are not true hæmal arches, but are formed by endogenous processes\*. In these vertebræ there are four canals,—the one under consideration, one for the spinal chord, and a pair for the vertebral arteries. In the *Balæniceps*, the vertebræ, from the seventh to the thirteenth inclusive, are thus constructed. The only *Stork* in which we have seen this structure is the Australian Jabiru, *Mycteria australis*; for a knowledge of which fact we are indebted to the kindness of Mr. Edward Gerrard. These pairs of inferior processes meet together in but few birds; nevertheless, this is the case in the White Pelican (*Pelecanus onocrotalus*) and in the Gannet (*Sula bassana*). In the former bird also there is no cup-and-ball articulation of the dorsal vertebræ, which reptilian character occurs in the Gannets, Cormorants, and Penguins. Notwithstanding their great size, the vertebræ of *Balæniceps* agree better with those of the Heron than with those of the Stork; but in their shortness, better with those of the Boatbill than with those of the longer-necked Heron: for the Heron, like the Giraffe, gains its great length of neck by elongation of the individual vertebræ rather than by an increase in their number. The ribs of the *Balæniceps* are lighter, weaker, and more cellular than those of its congeners. The oblong, narrow, neat pelvis of this bird is more like that of the Boatbill than that of the Stork, or even of the Heron. It differs, however, from that of either of these in not being expanded in a broad foliaceous manner over the top of the posterior ribs. This part again agrees with the pelvis of the Heron, inasmuch as the ischium passes much further backwards than the posterior part of the ileum. In *Ciconia alba* these two pelvic bones terminate in the same vertical line, whilst in the Adjutant and Boatbill the ileum projects backwards and farthest. The pubic bones are unusually broad. There are seventeen sacral vertebræ, the first of which has a pair of ribs. The caudal vertebræ are six in number, the last being composed of eight or ten embryonic vertebræ.

The sternal apparatus of this bird is very interesting. In shape the sternum is intermediate between that of the White Stork and that of the Cormorant, the keel, as in the latter bird, projecting evenly forwards anterior to the articulations with the coracoids, for a greater

\* See Prof. Owen's article in Orr's 'Circle of the Sciences,' entitled "Structure of the Skeleton and Teeth," p. 182, fig. 10. iv.

distance than in the Stork and Heron. Moreover, the keel is not quite so deep as it is in the congeners of this bird. It passes, however, to the end of the sternum, as in them; whereas in the Pelicans, Gannets, and Cormorants it scarcely continues beyond the middle of that bone. The episternal process is obsolete in this bird; it exists in the *Pelecanidæ*, Herons, and Boatbill, and is nearly obsolete in the Storks. The hyposternal processes are unusually long and arcuate; and there is on each side of the end of the keel another rather smaller emargination which is obsolete in the Storks, Herons, and Boatbill, but is well shown in the Spoonbill and the *probing* waders, *Numenius*, *Himantopus*, *Limosa*, &c. The tips of the furculum are subtriangular and rather flat; the bone then becomes very thick and triangular, having at the top of the thick part a large oval facet, which is adapted to the under part of the head of the coracoid. This thick part is very short, for the bone suddenly lessens, bends backwards, and passes on, rounded below and angular above, to thicken again at the angle, where it makes a most complete ankylosis with the tip of the sternal keel. This structure of the furculum is similar to what is found in *Pelecanus*, *Phalacrocorax*, and *Sula*; but we have seen no such 'merry-thought' bone in any Ardeine bird. In these, as in *Balaniiceps*, the rami of the bone are not only flat as they pass in between the heads of the coracoids, but this thin condition of the bone is continued throughout one half of their extent. They have no such sudden bend at the upper third, the arch being gentle, and the lessening size of the bone gradual. Nevertheless, in the Boatbill there is a slight tendency to this state of things. The blending of the furculum with the sternal keel seldom takes place in the true Herons and Storks; there continues even in old birds a synovial gliding joint, and in the Boatbill and some of the smaller Herons the furculum does not quite reach the sternum. This articulated condition is generally found in Gannets and Cormorants; but in old Pelicans ankylosis of the joints takes place. This occurs too in the Secretary bird, which is unique among the birds of prey, in having a joint there at all, so that this last-mentioned bird is a raptorial isomorph of the Cranes. In the latter birds (the *Gruidæ*) there is great difference in the structure of these parts; for whilst in such species as *Grus antigone* and *G. americana* we have in the adult bird complete coalescence, in the Balearic Crane, *G. pavonina*, and in the Trumpeter, *Psophia* (a Crane becoming slightly gallinaceous), the furculum does not reach the sternum at all.

Any lengthy remarks upon the bones of the limbs need not be made at present. They are about three-fourths the size of those of the Adjutant; but as the limbs had not enjoyed much liberty of exercise, they have not that robustness which is seen in the skeleton of old wild birds. The humerus is longer relatively, and the fore arm shorter in proportion than in the Adjutant; the thigh-bone is longer in proportion to the tibia and tarso-metatarsus in the *Balaniiceps* than in its larger relation. The toes are very long, reminding one of those of the Jacanas (*Parra*); and the most ridiculous care this stilted, stalking bird takes, both in taking up and setting down

its feet, makes it worth while to compare the length of the bones of its toes with that of the bones of the toes of the Great Adjutant.

	Hallux.	Inner toe.	Middle toe.	Outer toe.
	in.	in.	in.	in.
Adjutant .....	2·3	4·15	5·7	4·7
Balæniceps .....	3·3	3·8	6·5	6·4

To conclude, I may remark, that upon a careful examination of the osteology of the *Balæniceps*, after eliminating the teleological from the relational characters, I am decidedly of opinion that it is strictly an *Ardeine* bird, and more nearly related to *Cancroma* than to any other known type.

*Note I.*—Amongst the bones of the limbs, the humerus alone is pneumatic; the cavity of the os femoris being filled with medulla, as are all the more distal bones.

*Note II.*—The tongue is extremely small, an important *Pelecanine* character.

### 3. ON THE STRUCTURE OF THE GIZZARD OF THE NICOBAR PIGEON, AND OTHER GRANIVOROUS BIRDS. BY W. H. FLOWER, F.R.C.S., F.Z.S., ASSISTANT-SURGEON TO THE MIDDLESEX HOSPITAL.

(Aves, Pls. CLXV., CLXVI.)

At the meeting of the Zoological Society on the 14th of February last, Mr. Bartlett exhibited the gizzard of a Nicobar Pigeon, especially directing attention to two circular hard plates in connexion with the lining membrane of the organ\*. Having had, through Mr. Bartlett's kindness, an opportunity of examining these microscopically, I beg to lay the following account of them before the Society, prefixing it with some observations upon the structure of the inner coats of the gizzard in other granivorous birds. The latter were made quite independently of the researches of Dr. R. Molin†, and tend in a great measure to confirm the accuracy of that author's conclusions.

On examining the muscular stomach or gizzard of a granivorous bird, we find its interior lined by a distinct membrane, of leathery or sometimes horny consistence, and which can be stripped off from the softer coat below with the greatest facility, especially if the organ is not perfectly fresh. This membrane is thicker and harder at the middle portion of the gizzard than at the upper and lower parts, and especially at the two sides; where in many birds are tolerably defined, more or less circular, flat or somewhat concave titurating disks or bosses. In the other parts of the organ it becomes thinner and softer, and towards the proventricular orifice is of almost gelatinous

\* Proc. Zool. Soc. 1860, p. 99.

† *Sugli stomachi degli uccelli*. Denkschriften d. Kais. Acad. d. Wissenschaften, zu Wien, 3<sup>e</sup> Band, 1852.

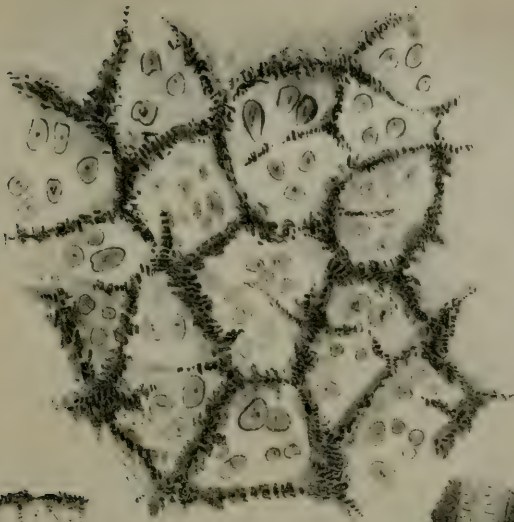


Fig. 6

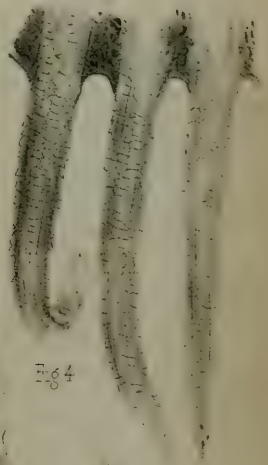


Fig. 4



Fig. 3

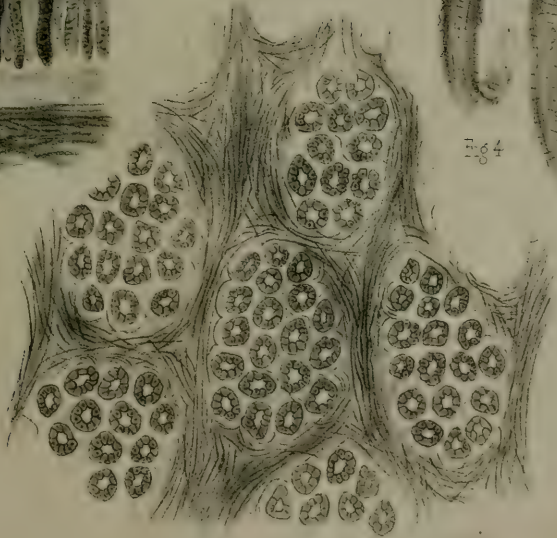


Fig. 2



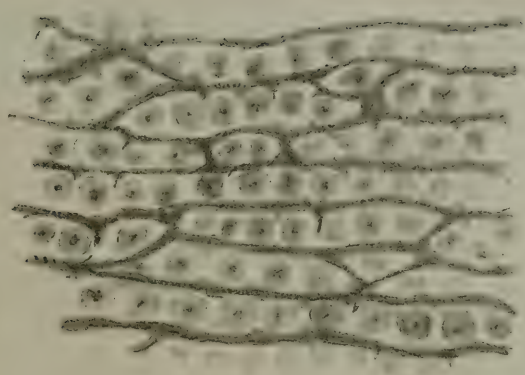


Fig 1

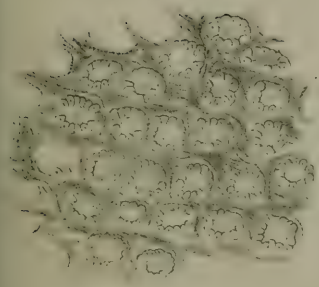


Fig 2

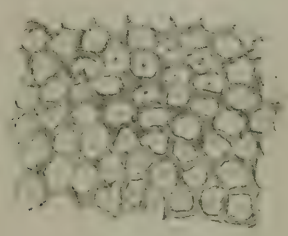


Fig 3

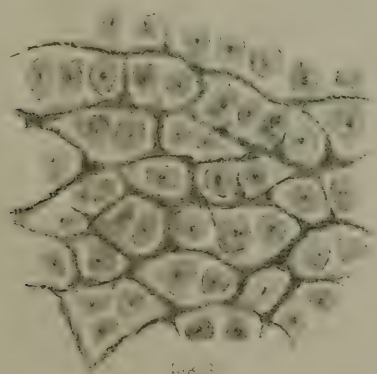


Fig 4





character. It is to the structure of the denser and thicker parts that the following remarks chiefly apply. The free surface is hard, generally rough, and always stained of a deep yellow colour. It is marked by sulci, usually deep, parallel, and disposed longitudinally on the disks, and finer, intersecting, or irregular in the other portions; these correspond with depressions in the membrane below, but, there are also linear grooves, not extending through the entire thickness, variously disposed in different birds, which add to the roughness of the surface. On carefully raising this layer, very numerous minute, delicate, white threads, attached to its under surface, are seen to be drawn out of the membrane below: these give to this surface, when detached, a soft, villous appearance.

The membrane upon which this epithelial stratum rests is thick, tough, and white, and is in contact externally with the muscular substance of the gizzard. When examined microscopically, it is found to consist of two portions—the deeper one composed of fibrous tissue, to the outer surface of which the muscular fibres are attached; the other superficial, comprising about three-fourths of the thickness of the entire membrane, composed of numerous tubular glands, or follicles, placed side by side, simple (in all the birds that I have examined \*), and terminating below in rounded closed extremities; their general shape much resembling that of a chemist's test tube (Pl. CLXV. fig. 3). A fibrous stroma, continuous with the deeper layer of tissue, extends between, and supports the tubes. A horizontal section through this stratum shows very well the mode in which the follicles are arranged. In some birds they appear closely packed together without any definite plan. In others they are disposed in lines or linear groups; this is the prevailing arrangement in the passerine birds. In a third series, comprising the fowls, duck, &c., they are collected into definite groups, oval, or polygonal in outline, and each containing from twelve to twenty-four tubes (Pl. CLXV. fig. 1). In these cases a fine fibrous stroma passes between the individual tubes, while a coarser intermediate substance separates the groups. Each tube is composed of an outer wall, lined by a single layer of nucleated cells, and contains within it a cylindrical, nearly transparent, solid body, which, being attached by its upper end to the cuticular layer, is readily drawn out of the tube, and is, in fact, one of the fine filaments mentioned above as visible to the naked eye. A closer examination of these cylinders, when pulled out from their follicles, shows that they have a fibrous structure, with a central axis of a different nature, rather darker, and sometimes distinctly granular; and that their surface is covered by numerous polygonal scales, giving it an imbricated appearance, like that of a young hair. On the addition of caustic potash they swell out, become more transparent, and their structure is rendered distinct (Pl. CLXV. fig. 4).

The horny layer itself presents in all granivorous birds that I have examined this common character: it is composed of numerous parallel, rod-like, solid bodies, placed side by side, extending from the

\* Molin describes them as compound in the Parrot.

attached to the free surface, imbedded in an intermediate substance or matrix, which is of a homogeneous nature, or contains more or less dark granular matter. These rods are prolongations of the cylinders contained within the tubes of the follicular coat. In the deeper portions of the tissue, the matrix is softer, and the granules more numerous, darker, and more distinct, often resembling cell-nuclei. The whole structure becomes less defined, and more bleeded together as it approaches the free-surface.

The further arrangement of this tissue varies in different birds, the variations being dependent upon those in the follicular layer. The cylinders are sometimes irregularly scattered, sometimes disposed in lines or linear groups, and in other cases collected into small triangular or polygonal groups. In the latter, the dark granules of the matrix are arranged in distinct intersecting lines, partitioning off the more transparent spaces, which contain the bundle of rods, and so definitely disposed as to give a beautifully reticulated appearance to a fine horizontal section.

The follicles bear so much resemblance in their appearance and situation to the gastric glands of other animals, that for some time I believed that their object must be the secretion of a fluid to assist in digestion, and that the cylinders of the epithelial coat were the ducts which conveyed this secretion to the free surface; but having failed in repeated attempts, by every method with which I am acquainted, to demonstrate their tubularity, I am obliged to revert to the idea that the office of the gizzard in the digestive process is purely mechanical. The function of these numerous follicles appears to be nothing more than the secretion of the horny membrane which lies over them, a rod being formed in the bottom of each, and gradually pushed up, very much in the manner in which a hair is developed; while either the upper part of the tube or the intermediate surface pours out the substance which fills up the space between the rods, and consolidates the whole tissue. As in ordinary epithelial tissues, this process must be constantly going on; as new formation takes place below, the surface is worn off by continual friction with the hard substances taken into the cavity of the gizzard.

I will next describe the peculiarities of these structures in a few particular examples:—

*Thrush, Blackbird, Nightingale (Turdus, Sylvia).*—In these birds the epithelial lining of the gizzard is comparatively thin, and not very hard; but yet it presents the characteristic structure described above. A transverse section shows the cylinders arranged more or less regularly in lines, but the intermediate substance is uniformly granular, and does not present distinct dark lines partitioning off groups of rods, as in the following birds.

*Sparrow, Bullfinch, Yellowhammer (Passer, Pyrrhula, Emberiza).*—Here the cylinders are more distinctly arranged in groups, each consisting of a long single row, generally of as many as six or eight.

*Fowl, Guinea-fowl, Quail (Gallus, Numida, Coturnix).*—In the true gallinaceous birds the follicles are collected into very definite oval or polygonal groups. The epithelial layer is thick and horny,

and in it each little bundle of rods is distinctly circumscribed by septa formed of dark granules (Pl. CLXV. fig. 1). In the first named, this layer at its thickest part measures  $\frac{1}{35}$  inch, and the follicular stratum is  $\frac{1}{40}$  inch deep.

*Duck (Anas boschas).*—Although so different in its general characters and habits, in the structure of the gizzard the duck closely resembles the fowl. A transverse section of either the follicular coat or the epithelial stratum of the two birds would be almost undistinguishable from each other under the microscope.

*Pigeon (Columba livia).*—The triturating disks are well-marked in this bird, three-quarters of an inch in diameter, but rather longer from above downwards than from side to side. The epithelial coat is well developed, being  $\frac{1}{40}$  inch in thickness. Its transverse section shows long dark lines, nearly parallel, with occasional cross lines, marking off the cylinders into groups, not quite so regular and elongated as in the passerine birds, but presenting a greater affinity to these in this respect than to the true Gallinaceæ. The tubes of the follicular membrane have a similar arrangement when seen in cross section (Pl. CLXVI. figs. 1 & 2). In *Ectopistes migratorius* and *Goura victoria* the structure is precisely similar. In the last the epithelial coat is very hard, and measures as much as  $\frac{1}{10}$  inch in thickness.

*Nicobar Pigeon (Calænas nicobarica).*—On each side of the interior of the gizzard (corresponding in position to the triturating disks in other birds) is a hard horny body, perfectly circular in outline,  $\frac{5}{8}$  inch in diameter, detaching itself when dry (in which state only I have seen it) from the remainder of the epithelial lining, as distinctly as if struck out by a punch. It is concave, rough, and yellow on the free surface, quite smooth and very convex (almost pyramidal, the sides sloping up to an apex in the centre) on the attached side, where it is imbedded in a corresponding hollow in the mucous membrane. When dried it is of almost stony hardness, and in section opaque and white. Its average thickness is  $\frac{1}{6}$  inch. The other parts of the gizzard are lined by a membrane presenting the usual characters of that found in pigeons. On examining the follicular layer microscopically, it was found to be similar in structure to the same tissue in other members of the family; but in that part over which the disks lie, the follicles appear more evenly distributed, and not so distinctly collected in linear groups as in other portions of the organ. In the thin part of the epithelial lining of the gizzard the cylinders are collected into irregular groups, most of them having a somewhat oval or linear form in transverse section; the intermediate granular lines being dark and well-marked. On moistening the attached surface of the disk, it was seen to be covered with the usual little filamentous bodies drawn out from the follicles. Vertical sections showed parallel rod-like bodies with little intermediate or granular substance. Horizontal sections confirmed this view. The rods are either round, oval, or of somewhat polygonal form, mostly of nearly uniform size, and showing a darker central portion, and closely packed together, with little intervening substance, and not collected

into groups. These characters are most distinct in the centre of the disk, and towards the sides gradually merge into those presented by the thin portion of the lining membrane (Pl. CLXVI. figs. 3 & 4).

Thus these millstone-like bodies are formed of the same elements as the epithelial lining in other granivorous birds, merely modified so as to give them additional hardness. Perhaps naturalists who have an opportunity of observing the Nicobar Pigeon in a wild state, may be able to inform us whether any circumstances connected with its food or habits throw light upon the purpose of this peculiarity in its structure. I am not aware of a similar condition existing in any other bird; but in connexion with the subject it may be mentioned that Carus \* has described and figured the lining membrane of the gizzard of the Fulmar Petrel (*Procellaria glacialis*) as studded with numerous horny tubercles, or teeth; no account is given of their microscopical structure.

#### EXPLANATION OF PLATES.

##### PLATE CLXV.

Fig. 1. Horizontal section of epithelial stratum of gizzard of Guinea-fowl (*Nu-  
mida meleagris*).

Fig. 2. Similar section of follicular stratum of the same bird.

Fig. 3. Vertical section of the lining membrane of the gizzard of the Common Fowl.

- A. Epithelial stratum.
- B. Follicular stratum.
- C. Fibrous stratum.
- D. Muscular coat.

Fig. 4. Three of the cylinders drawn out from their follicles: treated with liquor potassæ. From the Yellow-hammer (*Emberiza citrinella*).

##### PLATE CLXVI.

Fig. 1. Horizontal section of epithelial stratum of gizzard of the Common Pigeon (*Columba livia*).

Fig. 2. Similar section of the follicular stratum of the same bird.

Fig. 3. Horizontal section of the thin portion of the epithelial lining of the gizzard of the Nicobar Pigeon (*Calenas nicobarica*).

Fig. 4. A similar section taken from near the centre of the disk.

These sections are all represented as seen with a  $\frac{1}{4}$ -inch object-glass, and medium eye-piece; with the exception of Fig. 3, Pl. CLXV., which is seen with a 1-inch object-glass.

#### 4. ON A NEW FORM OF GRALLATORIAL BIRD NEARLY ALLIED TO THE CARIAMA (*DICHOLOPHUS CRISTATUS*). BY DR. G. HARTLAUB, FOREIGN MEMBER.

Professor H. Burmeister of Halle, who has lately returned to Europe after an absence of about three years in the southern portion of South America, has communicated to me the following notice of a new species of Grallatorial Bird, very nearly allied to the *Cariama*,

\* Tab. Anat. Comp. Illust. fol. pars iv. 1835, tab. vi.

which he met with in the woody parts of the Argentine Republic, and which I have the pleasure to name after him *Dicholophus burmeisteri*.

This discovery is the more important and interesting, inasmuch as the *Cariama* has, until now, remained rather an isolated type, widely separated from even its nearest relatives.

The *Chunga*, as this bird is called by the Spanish inhabitants of the Republic, seems to differ subgenerically from *Dicholophus* in the following points:—The lores are equally and thickly plumose; there is no conspicuous frontal crest; the tail is comparatively longer, and the tarsus comparatively shorter; the nails are nearly uniform on all the toes, and are stronger, larger, and more curved than in the *Cariama*. A very important difference, perhaps the most important, consists in the totally different habits of the more northern representative. Professor Burmeister proposes for it a subgeneric division, under the name of *Chunga*.

The *Chunga* is a large bird, of about 29 inches in length; it is found in the wooded districts of the province of Tucuman and Catamarca; it nests on the ground. Its eggs are white, slightly spotted with rufous. It feeds upon insects, and more especially upon locusts. The young have a rufous dress, thickly undulated with black: they very soon begin to take care of themselves. The *Chunga* is easily domesticated, and seems, even after a few days of captivity, attached to its master. Professor Burmeister saw two of them on a farm, which were of the size of an *Ædicnemus*, and still bore their downy plumage. They were fed upon little morsels of beef, but rejected larger pieces, as well as the entrails of fowls. They delighted in collecting bones, which they were in the habit of striking upon a stone and breaking to pieces. During the day they stalked gravely about, visited the house, jumped upon the tables and chairs, always collecting food, and slept at night at certain elevated stations, for instance on the projecting roof of the verandah. Professor Burmeister obtained a living bird at Catamarca, and observed it for some length of time. He saw it for the first time at the foot of the Sierra de Aronguiga, where it ran very quickly and shyly over the road and disappeared in the forest. In its wild state it is very difficult to kill; therefore it is preferable to search for the nest, and bring up the young birds by hand. The cry of this bird is heard very frequently in the district where it is found; it resembles that of the *Dicholophus cristatus*, and sounds like the bark of a young dog, but not quite so loud. The internal structure is quite the same as that of *Dicholophus*.

#### DICHOLOPHUS BURMEISTERI, Hartlaub.

*Statura et ptilosi ut in D. cristato formatis; crista frontali vix ulla. Totus pure cinereus, singulis plumis annulis alternantibus albidis et nigrescentibus tenuissime notatis; striga supra-oculari a loris inde ad aures usque producta alba; epigastrio pallidore; abdomine imo crisso et cruribus flavescenti-albidis; remigibus nigro-fuscescentibus pogonio interno ferrugineo-ful-*

*vescente fasciatis ; cauda dorso concolore, distinctius transversim lineolata ; reatricibus duabus intermediis unicoloribus ; reliquis fasciis duabus latis nigris, ante apicem notatis, omnibus subtus pallidioribus ; rostro et pedibus nigris ; iride obscure grisea.*

Long. tot. circa, 28'' ; rost. a nar. 13''' ; al. 12'' ; caud. 10'' ; tars. 5'' 2''' ; dig. med. 2'' ; dig. int. 1'' 3''' ; dig. ext. 1'' 5''' ; pollic. 7'''.

5. ON SOME HYBRID DUCKS. BY ALFRED NEWTON, M.A.,  
F.Z.S.

(Aves, Pl. CLXVII., CLXVIII.)

The phænomena of Hybridism are in themselves so interesting, and at present so little understood, that I venture to call attention to some examples illustrating the subject, which I now have the honour of exhibiting to the Society, and to make some observations thereon.

The proverbial fidelity of Pigeons, when once mated, has been found a matter of much convenience to at least one gentleman who has studied the great question of the "Origin of Species," by enabling him to experimentalize, comparatively without difficulty, on the different races, breeds, or varieties which can be produced from one common stock \*. I would remark, on the other hand, that the tendency, under certain circumstances, to polygamy which obtains among many of the Ducks, combined with their natural salacity, is such as to render that family, perhaps, the one of all others in which experiments on hybridism can be the most easily tried.

The frequent occurrence of hybrids among the *Anatidæ* has already attracted the notice of ornithologists, and among them of one of the most distinguished European naturalists, M. de Selys-Longchamps, who in 1845 enumerated no less than *twenty-five* different crosses produced between various members of this family, and who eleven years later was enabled to raise the number to *forty-four* †. Others have also been recorded.

Although by far the greater proportion of these crosses take place in a state of partial domestication, there can be, I think, no doubt that some occur among birds in a wild state. As an instance I may mention one, the offspring of which has been described, it is true, as a distinct and good species under the various names of *Anas mergoides*, *Mergus anataris*, or *Clangula angustirostris*, which I cannot but join such high authorities as Naumann, Hartlaub, Baldamus, Von Homeyer, Blasius, and De Selys in considering to be the produce of *Anas clangula* and *Mergus albellus*, though Kjærbölling, Cabanis, Reichenbach and Hennecke are of a contrary opinion.

\* C. Darwin, 'On the Origin of Species,' London, 1859, p. 42.

† Edm. de Selys-Longchamps, "Récapitulation des Hybrides observés dans la Famille des Anatidées," Bulletins de l'Acad. Roy. de Bruxelles, tom. xii. no. 10 (1845) ; and "Additions à la Récapitulation," &c., Bull. de l'Acad. Roy. de Belgique, tom. xxiii. no. 7 (1856).



HYBRID BETWEEN *SYNGLIS COLLARIS* AND *M. AMERICANA*







M. W. BARNARD

HYBRIDS BETWEEN ANAS BOSCHAS AND DAFIDA ACUTA.

Second generation.



The specimens which I beg leave first to submit to your notice were most kindly sent for my use by Mr. Daniel G. Elliot of New York, one of our Corresponding Members. They have been already exhibited at a former meeting (November 22, 1859), but I do not hesitate again to call your attention to them, because on that occasion the origin of two of them was, in my opinion, erroneously accounted for. They were then considered to have been respectively produced by crosses between (1) the Wild Duck (*Anas boschas*) and Pintail (*Dafila acuta*), (2) the Wild Duck and Muscovy Duck (*Cairina moschata*), and (3) the American Scaup (*Fuligula affinis*) and the Canvas-back (*F. valisneria*) or the American Pochard (*F. americana*)\*. Now, the first of these betrays, to my eye, no sign of descent from the Pintail. Indeed it differs in one respect only from the ordinary appearance of the common hybrid between the Wild Duck and the Dusky Duck (*A. obscura*); and in this one respect—the rufous colouring of the vent—it differs equally from the Pintail. But of this, more presently. The pedigree of the second bird I am disposed to think has been correctly suggested; but it may be remarked that it is not unlike that curious domesticated variety of the Wild Duck which is known to dealers as the “Labrador,” the “Buenos Ayres,” the “Black,” or the “Velvet” Duck. The origin of the third (Pl. CLXVII.) I believe to be due to a cross between the Collared Duck (*Fuligula collaris*) on one side, and on the other, one of the before-mentioned species, but probably the American Pochard. A resemblance to the Collared Duck is observable in the *white spot* under the chin, and the *grey speculum*,—characters which are not possessed by either of the Scaup Ducks found in the New World. This last specimen is a particularly interesting one. It will no doubt be fresh in the recollection of the ornithologists whom I have the honour of addressing, that in April 1847, Mr. Bartlett exhibited, at a meeting of this Society, three ducks, which he considered to form a new species, and accordingly described them by the name of *Fuligula ferinoides* †; one of them having been previously, but erroneously, figured by the late Mr. Yarrell in his ‘British Birds’ as an example of the American Scaup (*Fuligula affinis*). At the time, I believe that some doubts were expressed as to the validity of this species, and these doubts appear to me to be well-grounded. In the ‘Naumannia’ for 1851 (pp. 12–15), Herr Bädcker described some birds killed near Rotterdam as forming a new species under the name of *Fuligula homeyeri*, and in that Journal for the next year two of these examples were figured, which were subsequently exhibited by Mr. Gould at the meeting of this Society, March 28, 1854, and by him identified with Mr. Bartlett’s *F. ferinoides* ‡.

In the ‘Revue et Magazin de Zoologie’ for March 1853 (p. 117), M. Jaubert, under the name of *Anas intermedia*, gave an account and description of four male hybrids, as he considered them, between *Fuligula ferina* and *F. nyroca*.

\* Proc. Zool. Soc. 1859, p. 437.

† Ibid. 1847, p. 48.

‡ Ibid. 1854, p. 95.

Now, both *F. ferinoides* and *F. homeyeri* I believe to have been produced from the cross which M. Jaubert has suggested; and my belief is strengthened by the perfect analogy shown by the present hybrid from the New World. The subject has been much discussed upon the Continent; and those who support the view of the validity of the supposed species have relied principally on the assertion that birds in a state of nature do not hybridize,—an assertion which I venture to believe is not according to facts.

The specimens which I next have the honour to exhibit to you are, in my opinion, of no common interest. The statement has been again and again reiterated, with some slight variation of language, but always to the same effect, that hybrids between two distinct species are *inter se* infertile. I presume that no naturalist, whatever may be the views he takes of species, will have any hesitation in declaring that the Wild Duck (*Anas boschas*), with all its domesticated varieties, and the Pintail (*Dafila acuta*), are perfectly distinct species. It is well known that they will readily, in a state of confinement, breed together. In the winter of 1855-6 I received from a friend a pair of birds (male and female) which were bred by him from a Pintail Drake and a farm-yard Duck. These I turned down on my pond. It is fair to say that on this pond were also examples of both species. I watched them very closely; the male hybrid—as hybrids constantly do—at once reigned supreme over its denizens. As spring approached he became a most devoted and at the same time jealous husband: not a drake of any description would he allow to come near his mate; and in the battles in which he engaged in defence of his prerogative, he invariably came off victorious. I was never fortunate enough to obtain ocular proof of the consummation of his nuptials, but I most firmly believe that the male of no other species on the water ever had access to his wife. My brother, who was as constant in his observations as myself, entirely coincided in this opinion. In the month of April the female hybrid made her nest, and sat upon her eggs, in due time hatching four ducklings, which proved to be two females and two males. The skins of the latter I now exhibit (Pl. CLXVIII.), and I have no scruple whatever in regarding them as actually the produce *inter se* of a pair of hybrids between totally distinct species. In the breeding seasons of 1857 and 1858 I was away from home. Last year I was anxious to ascertain if these hybrids of the second generation would produce again *inter se*; and I watched them narrowly. The result of my observations was, that they were probably infertile; and after their death my suspicions were strengthened by the dissection I made. I may add, that in the present season the old hybrid female, the mother of the subjects of these remarks, has brought out two broods of young ones, which I cannot but regard as also the offspring of their putative father, but, through other occupations, I have not been able to afford the necessary time to watch them. I forbear, therefore, to adduce them in support of my argument. It, however, appears to me that the common assertion to which I have alluded requires considerable modification, and that all that can be said is, that though the hybrid

offspring of two animals clearly distinct may of themselves be perfectly fertile, it is not proved that this fertility extends to a second generation.

There is one other point which I must be allowed to mention before quitting the subject. It will be seen that the two birds exhibited differ remarkably in plumage, although of the same parentage, sex, and age; for they were born and killed within a day or two of each other. The larger specimen almost exactly resembles his father, but perhaps his colours are not so warm or brilliant. The smaller bird is of an appearance altogether distinct, and the almost uniform mottled grey of his breast and belly would make it perhaps difficult to guess his parentage. I can account for the divergence only in this way, that the Domestic Duck from which these birds are descended was of that almost whole-coloured variety which is not unfrequently seen in farm-yards, and that, while one of her grand-children shows nearly the typical plumage of the hybrid between the Wild Duck and the Pintail, the other takes after some progenitor of the variety I have mentioned. Whether this will serve to illustrate the peculiarity I have above mentioned, and also a curious fact alluded to by our Secretary in a late communication on some Hybrid Ducks bred in the Society's Gardens, wherein it is stated that the produce of a cross between *Tadorna vulpanser* and *Casarca cana* present a character "scarcely deducible from either,\*" I do not say. It is not, however, difficult to see what use may be made of this singular circumstance by those who advocate the views of Mr. Darwin; but into any consideration of the question I forbear to enter, contenting myself merely by noticing the fact.

#### 6. REMARKS ON THE ANAS (ANSER) ERYTHROPUS OF LINNÆUS. By ALFRED NEWTON, M.A., F.Z.S.

The determination of the species established by Linnæus has always been held by naturalists a matter of so great importance, that I have no scruple in occupying a portion of your time this evening with a few remarks respecting the bird which, in the 12th edition of his 'Systema Naturæ' is designated by the name of "*Anas erythropus*;" especially also as one of his editors (the late learned Professor Retzius), though noticing the "mira circa hanc avem confusio," has, in my opinion, failed to give a satisfactory solution of the difficulty. It will be, I think, universally admitted that the names employed by Linnæus, when, as in the present instance, they are drawn from any physical character, are remarkably apposite. This consideration of itself should have served as a warning to ornithologists against their imagining, as many have done, that he could possibly mean to apply the name "*erythropus*" to a species like the Bernicle Goose, with which he was sufficiently familiar, and to which it was in no degree suitable.

\* Proc. Zool. Soc. 1859, p. 442, Aves, Pl. CLVIII.

It will, perhaps, be convenient to examine first on what foundation "*Anas erythropus*" was established.

In the 12th edition of the 'Systema Naturæ' (Holmiæ, 1766) we find (vol. i. pars 1. pp. 197-8) the species as the eleventh in order of the genus *Anas*, and the account given is:—

"*A. cinerea, fronte alba.* Faun. Svec. 116." [I omit all the synonyms borrowed from other authors.] "*Rostrum rubrum. Pedes rubri.*"

Now these latter characters clearly can have no reference to the Bernicle Goose, even if that species were not elsewhere included as *Anas bernicla*, var.  $\beta$ .

Turning then to the edition of the 'Fauna Suecica' cited (Stockholmæ, 1761), we have (p. 41) as follows:—

"116. *ANAS erythropus cinerea; fronte alba.* Fn. 92. . . . .  
*Anser cinereus ferus, torque inter oculos et rostrum albo, erythropus.*  
W. Botniensibus Fjæll-gås. Habitat in Helsingia, Lapponiæ alpi-  
bus."

To this succeeds a description of the male, which I admit is open to objection; but the matter, in my opinion, is rendered conclusive by the description of the female, which, in the edition of the 'Fauna Suecica' here referred to, and published fifteen years previously (Lugd. Bat. 1746), is alone given. It is this:—

"*Rostrum sordide carneum, frons alba.* Caput, collum, dorsum, cauda cinerea; pectus et abdomen candida: maculæ in sterno nigrescentes: *Pedes sanguinei.*"

It is, therefore, plain, that by *Anas erythropus* Linnæus did not intend to designate the Bernicle Goose, but a bird known in his time to the Swedes of Westro-Bothnia by the name of Fjæll-gås—*i. e.* "Fell" or "Mountain Goose." It accordingly remains to be seen what that species is.

It appears by the note-books of the late Mr. John Wolley, which are now in my possession, that in all his researches he was able to find only two species of Wild Goose inhabiting the extensive district in Lapland which he so carefully explored, and of which part was comprehended in the ancient province of Westro-Bothnia. These species are known to the Finns, who form the great bulk of the population, respectively as the "Iso-hanhi" and "Killio-hanhi," the former signifying "Great Goose," the latter "*Mountain Goose.*" The Iso-hanhi he had several opportunities of identifying as the well-known Bean Goose (*Anser segetum*); the other he found, somewhat to his surprise, to be, not, as he had been told by Swedish ornithologists, the Bernicle Goose, but a bird of about that size, and at the same time closely resembling, in plumage and other physical characters, the White-fronted Goose (*Anser albifrons*). Not to extend the present remarks, I may state briefly that he was not able to discover that the Bernicle Goose was known to any of the inhabitants of the interior of the country: a statement which is singularly corroborated by Mr. Dann's note communicated to Mr. Yarrell (B. B. iii. p. 73) in reference to the last-named species:—"A skin of this Goose was shown me by some Laps near Gillivara, who were ignorant of the





J Wolf del  
J Jenner scul

A & N Hannard

AQUILA GURNEYI







W. C. C. del.  
J. G. S. sculp.

M. & N. H. B.

TANYSIPTERA SABRINA





J Wolf del  
J Jennens lith

M & N Hanhart del

MEGAPODIUS WALLACHI





J. Wolf del.  
J. Jennens lith.

M. & N. Hanhart

HABROPTILA WALLACII

bird, never having seen it before. It was shot at Killingsuvanda." Accordingly, in the Catalogue of his Eggs sold by Mr. Stevens in 1856, he stated, under the head of "*Anas albifrons*," that "this interesting bird is the proper Fjell-gas of the Swedes, which name has, however, been applied to the Bernicle in their works on Natural History. The Lapland specimens seem to be of the small-sized race, which has been named *Anser minutus* by Naumann." I must here take exception to part of Mr. Wolley's statement, some Swedish writers being quite aware that the "Fjæll-Gås" was not *Anser leucopsis*, as, for instance, Professor Zetterstedt, in the account of his travels in Lapland \* (vol. ii. p. 161).

In the Catalogue of his Eggs sold in the following year (1857), Mr. Wolley further identified "the only White-fronted Geese which breed in Lapland," with the *Anser finmarchicus* of Bishop Gunner, described in one of the notes (pp. 264-5) of Professor Leem's great work †, "as distinct from the larger White-fronted Goose."

I can only say that I entirely coincide with the views thus expressed by Mr. Wolley, while I also identify the "Killio-hanhi ‡" or "Fjæll Gås," with the *Anas erythropus* of Linnæus; and I here subjoin a concise summary of the principal synonyms of this bird.

#### ANSER ERYTHROPUS (Linn.).

*Anas (Anser) erythropus*, Linn. Syst. Nat. ed. 12 (1766), vol. i. pars 1. p. 197 (non Auct.).

*Anser finmarchicus*, Gunner, in Leemii de Lappon. Comm. notis (1767), p. 264.

*Anser temminckii*, Boié, Isis, 1822, p. 882.

*Anser minutus*, Naum. Naturgesch. der Vög. Deutschl. (1842) vol. xi. p. 365, tab. 290.

### 7. LIST OF BIRDS COLLECTED BY MR. WALLACE AT THE MO- LUCCA ISLANDS, WITH DESCRIPTIONS OF NEW SPECIES, ETC. BY GEORGE ROBERT GRAY, F.L.S., F.Z.S., ETC.

(Aves, Pls. CLXIX.-CLXXII.)

The present list contains an enumeration of the Birds lately sent to this country by that indefatigable collector Mr. Wallace, from Batchian or Bakian Island, including a few from Kaisa or Kiou Island; to these are added those that he had forwarded on a previous occasion from Amboyna and Ternate; thus embracing a hundred species found on four of the Molucca Islands. I am therefore induced to refer to the names of those species that have been recorded

\* 'Resa genom Sweriges och Norriges Lappmarker, af Joh. Wilh. Zetterstedt.' Two vols: 8vo. Lund, 1822.

† 'Canuti Leemii de Lapponibus Finmarchiæ Commentatio, una cum J. E. Gunneri notis, &c. &c.' Kjöbenhavn, 1767.

‡ In Europæus' "Svenskt-Finskt Handlexikon" (Helsingfors, 1853), the word is spelled "Kallio" (vide page 42, sub voce 'Berg').

by other ornithologists as coming from the Molucca group, and also from the large neighbouring islands of Gilolo or *Halmaheira*, Ceram, Bourou or Bourou, &c., which, if taken collectively with the Moluccan species, will form the nucleus of an Ornithological Fauna (of upwards of 200 species) of what would be more properly designated the Spice Islands.

I have been enabled by a very recent arrival from Gilolo and Ternate, to add to this list some twenty-seven additional species; they are distinguished by an asterisk.

#### FALCONIDÆ.

##### AQUILA (HETEROPUS?) GURNEYI. (Pl. CLXIX.)

*Immature*.—Male. Hair brown, varied with buffy-white in the form of bars and streaks; the head, neck, beneath the body, and tail-coverts rufous-white, except on the breast and sides, which are rufous; this latter colour is also sparingly displayed in patches on the head and neck; the lesser wing-coverts and scapulars irregularly banded with white; the greater wing-coverts, secondaries, tertiaries, and tail deep brown, banded irregularly with grey; the primaries deep black.

*Mature bird* probably brownish black, with indications of irregular greyish bands.

Length 35" 6<sup>'''</sup>, wings 22" 3<sup>'''</sup>, tail 16" 3<sup>'''</sup>, bill from gape 2" 3<sup>'''</sup>.  
Batchian Island (*Wall. Coll.*).

This fine bird partakes of the form of *Aquila malayensis*, but it is larger and of a totally different colour. I have named this remarkable bird after J. H. Gurney, Esq., who is paying particular attention to the group to which it belongs, and who possesses one of the finest series of them.

##### \*HALIAËTUS (CUNCUMA) LEUCOGASTER.

*Falco leucogaster*, Gmel. S. N. i. p. 257.

*Haliaëtus leucogaster*, Gould.

Gilolo (*Wall. Coll.*).

##### HALIASTUR LEUCOSTERNUS, var.

B.M.

*Haliaëtus leucosternus*, Gould, B. of Austr. i. pl.

*Haliastur leucosternus*, G. R. Gray, List of B. B.M. i. p. 13.

*Haliaëtus (Ictinoaëtus) leucosternon*, Kaup.

Batchian, Amboyna, and Ternate.

Rather smaller in all its proportions to the Australian and Louisiade specimens.

##### BAZA REINWARDTII.

B.M.

*Falco (Lophotes) reinwardtii*, Müll. & Schleg. Verh. Nederl. t. 5.

*Lophastur jerdoni*, Bl. Journ. A. S. B. xi. p. 464.

*Baza jerdoni*, Bl. Cat. of B. p. 18.

*Baza reinwardtii*, Bl. Cat. p. 317.



*Aviceda reinwardtii*, Pr. B.

*Aviceda sumatrensis*, Lafr. Rev. Zool. 1848, p. 210?

Batchian.

**TINNUNCULUS MOLUCCENSIS.**

B.M.

*Cresserelle des Moluques*, Temm. & Schl. Fauna Jap. p. 3.

*Tinnunculus moluccensis*, Homb. & Jacq. Voy. au Pôle Sud, Ois. t. 1. f. 2.

*Falco tinnunculus*, Müll. Verh. Ethn. p. 87?

Batchian; Kaisa Island; Amboyna; Ternate; Djilolo.

*Hierax caerulescens*, Vig. Molucca Islands.

**ASTUR IOGASTER.**

*Falco iogaster*, Müll. & Schleg. Verh. Nederl. p. 110.

*Epervier océanien*, ♂, Voy. au Pôle Sud, t. 2. f. 1.

*Accipiter iogaster*, Pr. B. Consp. Av. i. p. 33.

Amboyna and Gilolo (*Wall. Coll.*).

**ASTUR GRISEOGULARIS.**

B.M.

Adult. Greyish-slate colour; more decidedly grey on head and mentum; nape and between the shoulders tinged with rufous vinaceous; beneath the body rufous vinaceous, narrowly banded with greyish-white.

Young male? Head and throat slaty-grey, paler on the latter; nape castaneous; back and wings brown and greyish-black mixed; tail brown, and some feathers greyish-black, banded with darker; breast, sides of abdomen, and thighs rufous, barred with white, which is margined with black; abdomen white, broadly barred with fuscous; beneath the tail, old feathers rufous-white barred with black, new feathers grey barred with black.

Female. Head, occiput, and ear-coverts black, varied with black and slightly with rufous; back and wings brown, each feather spotted with white and margined with pale rufous; upper surface of tail brown, banded with black, paler brown between the bands near the shaft; beneath the body white, marked with streaks on the breast, and crescent-shaped bands of black on the abdomen.

Length 18" 6"', tarsi 2" 5'''.

Batchian, Djilolo, and Ternate.

This bird approaches *Astur approximans* (Vig. & Horsf.), but the bill is larger; the head and throat are decidedly grey; the tarsi are much shorter, though the toes are about the same length.

**\*ASTUR HENICOGRAMMUS.**

Juv.? Head and back of neck black, varied with white, and slightly with rufous; back, wing-coverts, and tertials black, spotted with white, the former colour narrowly margined with rufous; quills and tail-feathers black and rufous banded; under surface white banded with rufous, the rufous colour on breast varied with black;

under surface of wings and tail rufous white, spotted or banded with black.

Length 16", wings 8" 9".

East Gilolo.

Probably a very young stage of *Astur griseogularis*.

\*ACCIPITER ERYTHRAUCHEN.

Slaty-black; lore, cheeks, mentum, abdomen, and under tail-coverts slaty-white; side of neck and nape castaneous rufous; breast, sides of abdomen, and thighs whitish-rufous; under wing-coverts rufous-white, varied with slaty-white; quills beneath banded with rufous or slaty-white and slaty-black.

Length 11" 9", wings 8" 9".

East Gilolo (*Wall. Coll.*).

MICRONISUS SOLOENSIS.

*Falco soloensis*, Horsf. Linn. Trans. xiii. p. 137.

*Falco cuculoides*, Temm. Pl. Col. 110. 129.

*Tachyspiza soloensis*, Kaup. Classif. der Saug. und Vög. p. 116.

*Micronisus soloensis*, G. R. Gray.

Batchian (*Wall. Coll.*).

STRIGIDÆ.

\*ATHENE RUFOSTRIGATA.

This bird approaches the *Athene connivens* in general appearance, but it is of a blackish-slate colour on the upper surface; the bands on the quills and tail-feathers are less prominent, and the white spots on the wings are less numerous; while the longitudinal streaks on the white under surfaces are of a rufous colour, slightly varied with slaty-black.

Length 17" 9", wings 11" 6".

East Gilolo (*Wall. Coll.*).

ATHENE HYPOGRAMMA.

B.M.

Upper surface uniform deep rufous-brown, more obscure on the head; scapulars and some of the wing-coverts banded with white; front and throat white; under surface entirely white, broadly banded with brownish-rufous; tail banded with paler colour; tarsi plumed and rufous-white; toes covered only with strong scattered hairs.

Length 15" 3", wings 8" 9".

Batchian and Gilolo.

This bird bears a great similarity to the *Athene variegata* (Q. & G.), but it does not exhibit the marks visible on the upper surface of that bird and it also differs in having the barring of the under surface extending on the tail-coverts. It is also larger in all its proportions.

*Athene squamipila*, Pr. B. Ceram.

EPHIALTES LEUCOSPILA.

B.M.

Upper surface rufous, speckled and irregularly striated longitu-

dinally with black; the marks on the head are broader and more defined; under surface varied with rufous and white, with black irregular marks down the shaft of each feather; scapulars, wing-coverts, outer margins of quills, and of the outer tail-feather spotted with white; tarsi plumed; toes entirely naked.

Length 11", wings 6" 6".

Batchian and Eastern Gilolo.

In general appearance this bird is very like *Ephialtes manadensis* (Q. & G.), but it is larger in all its proportions, and is more prominently marked with white on the wing-coverts.

*Ephialtes magicus*, Müll. Amboyna; Banda Islands.

#### CAPRIMULGIDÆ.

##### BATRACHOSTOMUS PSILOPTERUS.

Rufous-cinnamon; front, middle of throat, breast, abdomen, and under tail-coverts varied with rufous and white—the latter colour margined with black; wing-coverts, scapulars, and some of the tertials spotted with white, surrounded with black; a spot behind each eye and at the base of mandibles white; tail irregularly banded with black; quills black, with the outer web cinnamon colour; bristles lengthened and deep black.

Length 12", wings 7".

Batchian and Gilolo (*Wall. Coll.*).

#### HIRUNDINIDÆ.

##### MACROPTERYX MYSTACEUS.

B.M.

*Cypselus mystaceus*, Less. Voy. de la Coqu. Zool. i. t. 22.

*Macropteryx mystaceus*, Swains. Classif. of B. ii. p. 340.

*Dendrochelidon mystaceus*, Boié, Isis, 1844, p. 166.

Batchian and Eastern Gilolo; Amboina.

##### COLLOCALIA HYPOLEUCA.

B.M.

*Collocalia hypoleuca*, G. R. Gray, Proc. Z. S. 1858, p. 170.

Batchian.

*Collocalia esculenta* (?). Amboyna.

##### HIRUNDO GUTTURALIS.

B.M.

*Hirundo gutturalis*, Scop.

*Hirundo panayensis*, Gmel. S. N. i. p. 1018.

*Hirundo javanica*, Sparrm. Mus. Carls. t. 100.

Batchian and Gilolo.

#### CORACIADÆ.

##### EURYSTOMUS ORIENTALIS.

*Coracias orientalis*, Linn. S. N. i. p. 159.

*Eurystomus orientalis*, Steph. Gen. Zool. xiii. p. 99.

*Colaris orientalis*, Cuv. Règ. Anim. 1817, i. p. 401.

Batchian and Ternate (*Wall. Coll.*).

## EURYSTOMUS AZUREUS.

B.M.

Bronzy-black, tinged with green on the back; the feathers of the wings, rump, and beneath the body broadly margined with deep blue, but the latter varying, in certain lights, to bright cobalt-blue, especially on the quills, tail-feathers, and beneath the body; the throat blue, with the shaft of each feather more bright; the quills near the middle with a pale verditer spot.

Bill and feet red.

Length 13" 6"', wings 8", bill from gape 1" 9"'.  
Batchian.

*Eurystomus pileatus*, Reinw. Molucca.

## ALCEDINIDÆ.

## \*HALCYON FUNEBRIS.

B.M.

*Halcyon funebris*, Forst., Pr. B. Consp. Av. i. p. 157.

*Cyanalcyon funebris*, Pr. B.

Djilolo.

## HALCYON COLLARIS (var.).

B.M.

*Alcedo collaris*, Scop. Del. Flor. & Faun. Insubr. p. 90.

*Halcyon collaris*, Swains. Zool. Illustr. pl. 27.

Batchian and Gilolo.

The bill appears to be of a smaller size than those of the Indian continent.

## HALCYON LAZULI.

B.M.

*Alcedo lazuli*, Temm. Pl. Col. 508.

*Halcyon lazuli*, G. R. Gray, Gen. of B. i. p. 79.

*Todiramphus lazuli*, Pr. B. Consp. Av. p. 157.

Amboyna.

## HALCYON DIOPS.

B.M.

*Alcedo diops*, Temm. Pl. Col. 272.

*Halcyon diops*, G. R. Gray, Gen. of B. i. p. 79.

*Todiramphus diops*, Pr. B. Consp. Av. p. 157.

Amboyna, Ternate, Batchian, and Gilolo.

## \*HALCYON SANCTUS.

*Halcyon sancta*, Vig. & Horsf. Linn. Trans.

Ternate. (*Wall. Coll.*)

## TANYSIPTERA NAÏS.

*Alcedo dea*, Linn. ?

Upper surface black, with the feathers broadly margined with indigo, those of the cheeks, nape, and wing-coverts brighter blue; top of the head margined with silvery-blue; eyebrows, round the occiput, shoulder of wings, and the narrow central portion of the two middle tail-feathers verditer-blue; beneath the body, rump, and

lengthened spatular ends of the two middle tail-feathers white; the outer tail-feathers white, broadly margined with blue-black.

Length 12", wings 4", bill from gape 1" 11".

Amboyna (*Wall. Coll.*).

This bird, it is supposed, will eventually be found to possess some characters distinguishing it from that described by Linnæus, as from Ternate, and therefore the above name has been given to it provisionally.

TANYSIPTERA ISIS †.

B.M.

Upper surface dull black, with the feathers of the nape margined with deep blue; cheeks and some of the wing-coverts margined with bright blue; top of head silvery-blue; eyebrows, round occiput, and margins of shoulders verditer-blue; beneath the body and rump white; tail-coverts deep blue; two middle tail-feathers verditer-blue, margined with bright blue, the inner margin near the base and the *short* spatular ends white; lateral feathers deep blue, with the ends and inner webs more or less white.

Length 11" 9", wing 3" 8", bill from gape 1" 8".

Batchian and Gilolo.

This species is nearest to the remains of an example of this genus which I described under the name of *Tanysiptera nympa*; but the middle tail-feathers are of a bright indigo-blue, and not so narrow near the ends, which are also not so spatula-shaped; the outer feathers are entirely of a bluish-black; the crown of the head is also of a bright indigo-blue.

TANYSIPTERA SABRINA. (Pl. CLXX.)

B.M.

Upper surface black; cheeks, nape, and upper part of back deep blue; top of head bright blue; eyebrows, round the occiput, and shoulders of wings, silvery-blue; spot in the middle of back, beneath the body, and lateral tail-feathers, white; the two middle tail-feathers with the basal part and the lengthened spatular ends white; the narrow part silvery-blue.

Length 12" 9", wings 4" 3", bill from gape 1" 8".

Kaisa or Kiou Island.

This species is like Mr. Gould's *Tanysiptera sylvia*, in having the white spot on the middle of the back; otherwise it is most like *Tanysiptera nais*, though the blue is of a different hue.

The genus *Tanysiptera* now consists of the following species:—

*T. dea*, Linn. Ternate.

(?) *T. nais*, G. R. Gray. Amboyna.

*T. galatea*, G. R. Gray (*A. dea*, Less.). New Guinea.

*T. hydrocharis*, G. R. Gray. Aru Islands.

*T. nympa*, G. R. Gray. Philippine Islands?

*T. isis*, G. R. Gray. Batchian and Gilolo.

*T. sabrina*, G. R. Gray. Kaisa Island.

*T. sylvia*, Gould. Cape York.

† This seems to be the bird described by Herr F. Heine in Cabanis' 'Journal für Ornithologie,' 1859, p. 406, as *Tanysiptera margarethæ*.—P. L. S.

## CEYX LEPIDA.

B.M.

*Ceyx lepida*, Temm. Pl. Col. 591. f. 1.

Amboyna and Batchian.

## CEYX UROPYGIALIS.

B.M.

Black, with the feathers of the head and wing-coverts bordered with prussian blue; cheeks streaked with the same colour; the back and tail-coverts streaked with bright ultramarine blue; the rump verditer, narrowly banded with white; the throat, and spot on the side of neck, yellowish-white; frontlet and beneath the body rufescent, tinged with yellow.

Length 5'' 1''', wings 2'' 4''', bill from gape 1'' 7'''.

Batchian and Ternate.

*Alcedo ispida*, var. des Moluques. Bourou or Bouro; Banda.

## ALCYONE AFFINIS.

B.M.

The form of the bill agrees with that of *Alcyone lessoni* of New Guinea, but is rather shorter; the blue of the upper surface is of a paler hue, while the breast and abdomen are of a more uniform dark rufous colour. In these latter respects it agrees best with *Alcyone pulchra* of Mr. Gould.

Batchian.

## \*MEROPS ORNATUS.

*Merops ornatus*, Lath. Ind. Orn. Suppl. p. xxxv.Ternate (*Wall. Coll.*).

## PROMEROPIDÆ.

## NECTARINIA ASPASIOIDES.

*Nectarinia aspasia*, pt., Müll.

This bird seems to agree with the figure given by Lesson in *Voy. Coqu.* t. 30. f. 2, in its general coloration, but the bill is much longer.

Amboyna (*Wall. Coll.*).

## NECTARINIA AURICEPS.

B.M.

This bird is closely allied to the last, but the top of the head is rich golden green; and the throat, lower part of back, and wing-coverts are of a rich glossy steel-blue.

Batchian and Ternate.

## NECTARINIA FRENATA.

B.M.

*Nectarinia frenata*, Müll. Verh. Nat. Gesch. p. 61.*Cyrtostomus frenatus*, Reichenb.

Batchian and Ternate.

*Nectarinia solaris*, Temm. Amboyna.*Nectarinia zenobia*, Less. Amboyna; Gilolo.

## DICÆUM SCHISTACEICEPS.

B.M.

Head, neck, and breast greyish-slate; the latter with a large spot of vermilion; back, sides, and under tail-coverts olive-green; upper tail-coverts yellowish green; wings and tail æneous.

Length 3" 5"', wings 2".

Batchian and E. Gilolo.

*Dicæum erythrothorax*, Less. Bourou; Amboyna.

*Dicæum rubrocanum*, Temm. Banda.

## MELIPHAGIDÆ.

## MYZOMELA SIMPLEX.

B.M.

Rufous greyish-brown; paler beneath; quills and tail obscure brown, margined with brownish-crimson; bill black; feet pale brown.

Length 5" 2"', wings 2" 3".

Batchian.

*Myzomela boiei*, Müll. Banda.

## ANTHOCHÆRA SENEX.

B.M.

*Tropidorhynchus gilolensis*, Temm. Pr. Consp. Av. p. 390?

Fuscous-black, with the shafts pure white, especially on the throat and breast; wings grey, with the tips and shafts of the feathers pure white; orbits of the eyes naked; bill and feet black.

Length 9", wings 4" 3", bill from gape.

Batchian and Gilolo.

*Tropidorhynchus subcornutus*, Temm. Ceram.

*Tropidorhynchus bouroensis*, Less. Bourou.

*Tropidorhynchus ? moluccensis* (Gm.). Molucca.

## LUSCINIDÆ.

## ACROCEPHALUS ORIENTALIS.

B.M.

*Calamoherpe orientalis*, Pr. B. Consp. Av. p. 285.

Batchian.

## ACROCEPHALUS FASCIOLATUS.

Deep olivaceous-brown, with the shafts of the feathers on the head and upper part of neck of a pale colour; the lores and cheeks yellowish-white; the throat and breast yellowish-white, banded with dusky; the abdomen yellowish-white, darker on the sides; the under tail-coverts pale rufous-white.

Length 7", wings 3".

Batchian (*Wall. Coll.*).

## SYLVIA FLAVESCENS.

Greyish olivaceous-green, with a narrow band from nostrils over the eyes and ear-coverts yellowish-white; beneath the body white, tinged with greyish on the throat; breast and sides with dashes of pale yellow; the abdomen and under tail-coverts tinged with pale

yellow ; upper mandible black, lower yellowish-white ; feet pale horn-colour.

Length 4" 10<sup>'''</sup>, wings 2" 6<sup>'''</sup>.

Batchian (*Wall. Coll.*).

**ZOSTEROPS CHLORIS.**

B.M.

*Zosterops chloris*, Müll. Pr. B. Consp. Av. p. 398.

Ternate.

**ZOSTEROPS (?) ATRICEPS.**

Yellowish-green ; the head, tail, and quills brownish-black, the two latter bordered narrowly with yellowish green ; beneath the body and under wing-coverts white ; the under tail-coverts pale king-yellow ; the circle round the eyes white ; bill black, with base of lower mandible yellowish ; feet horn-colour.

Length 4" 10<sup>'''</sup>, wings 2" 4<sup>'''</sup>.

Batchian (*Wall. Coll.*).

**MOTACILLA FLAVESCENS.**

*Timor Wagtail*, Lath. Gen. Syn. iv. p. 104.

*Motacilla flava*, var.  $\beta$ , Lath. Ind. Orn. ii. p. 504.

*Motacilla flavescens*, Shaw, Gen. Zool. x. p. 559.

Amboyna and Gilolo (*Wall. Coll.*).

**ANTHUS ARBOREUS, var.**

*Alauda trivialis*, Linn.?

*Anthus arboreus*, Bechst.

*Pipastes arboreus*, Kaup.

Batchian (*Wall. Coll.*).

**TURDIDÆ.**

**\*TURDUS (MONTICOLA) ERYTHROPTERUS.**

Blue grey, each feather margined with black and then white or dusky white ; wings and tail black, margined externally with blue grey and tipped with pure white ; some of the under wing-coverts and under tail-coverts castaneous rufous, marked with bluish-black and margined with white.

Length 10", wings 5" 3<sup>'''</sup>.

Djilolo (*Wall. Coll.*).

**PITTA INORNATA †.**

B.M.

The appearance of this bird is very similar to *Pitta mackloti* and *P. celebensis*, but it is without any sign of the pale blue vertical band, and without the prominent black mark above and below the broad blue pectoral band ; the bill is larger, and the tarsus a trifle longer, than in either of the above-mentioned species. The blue on the lower part of the back and on the wings is less apparent. In size it is very similar to the other allied species.

Batchian and Gilolo.

† Described by Herr F. Heine (*Journ. f. Orn.* 1859, p. 406) as *Coloburis rufiventris*.—P. L. S.



## \*PITTA MAXIMA.

B.M.

*Pitta maxima*, Forsten, Verh. Nat. Gesch. Nederl. p. 14.*Brachyurus maximus*, Pr. B. Consp. Av. i. p. 253.*Gigantipitta maxima*, Pr. B.

Gilolo.

## \*PITTA CYANONOTA.

B.M.

Very similar to the former species, but the back and wings are entirely of a whitish-blue colour.

Ternate.

*Pitta cyanoptera*, Temm. Molucca.*Pitta brachyura*, Linn. Molucca.

## CRINIGER FLAVICAUDUS.

B.M.

*Trichophorus flavicaudus*, Pr. B. Consp. Av. p. 262.*Trichophorus sulphureus*, Temm.

Batchian and Djilolo.

## \*ORIOIUS PHÆOCHROMUS.

Obscure olivaceous-brown; beneath the body greyish-olivaceous, especially on the throat; wings and tail pale olivaceous-brown, with the shafts of the quills and tail rufous-white; the feathers are also slightly margined with pale olivaceous white. Bill and tarsi black.

Length 10'', wings 5'' 3'''.

East Gilolo (*Wall. Coll.*).

## MUSCICAPIDÆ.

## RHIPIDURA TRICOLOR.

*Rhipidura mimoides*, Müll. MSS.*Muscicapa tricolor*, Vieill. N. Dict. H. Nat. xxi. p. 490.

*Muscipeta melaleuca*, Quoy et Gaim. Voy. de l'Astrol. Zool. i. p. 180.

*Rhipidura melanoleuca*, G. R. Gray, Gen. of B. i. p. 259.*Sauloprocta melanoleuca*, Cab. Mus. Orn. Hein. p. 57.*Rhipidura atripennis*, G. R. Gr.

Batchian; Ternate; Djilolo; Amboyna.

The specimens from these localities are so similar to those from New Ireland, New Guinea, and Aru Island, that it is not possible to define characters to distinguish them from one another. I was induced to separate those of the last-mentioned place, from their wings and tails being of a deeper black colour, which may be owing to the age of the bird. In Australia this species is represented by *R. motacilloides*, which is altogether smaller.

*Rhipidura squamata*, Müll. Banda.

## \*MONARCHA CINERASCENS.

*Drynophila cinerascens*, Temm. Pl. Col. 430.*Monarcha cinerascens*, G. R. Gray.Ternate (*Wall. Coll.*).

## MONARCHA BIMACULATA.

Like *M. trivirgata*, Temm. (ex Timor), but the bill is very small, and entirely black; the tail has the white only on the end of the two outer feathers.

Length 6", wings 3", bill from 7".  
Batchian and Djilolo (*Wall. Coll.*).

## MONARCHA NIGRIMENTUM.

B.M.

Like *M. trivirgata* (ex Timor), but the bill is rather longer and more compressed; the black on the throat only occupies a small space beneath the bill; the tail also differs in not having any white on the ends of the four middle feathers, but only on the three outer feathers, decreasing in quantity inwardly; bill blue lead; feet lead-colour.

Length 6" 10", wings 3", bill from gape 9".  
Amboyna.

It may be concluded that each locality has its own peculiar species, as we find that the Timor examples are different from the others, in having a greater quantity of white on the ends of the outer tail-feathers, and that this colour is even found on the inner web of the fourth feather; while in the Australian examples, the white colour is only found on the three outer feathers, and does not extend so far up the feather as in the former species; the bill is also a trifle smaller. This latter may be considered as *Monarcha gouldii*, G. R. Gr. An allied species has been described in the New Guinean list as *Monarcha griseogularis*, G. R. Gr.

## MYIAGRA NITENS.

B.M.

♂. Black, with the feathers broadly margined with glossy deep green; quills and tail black, both narrowly margined with glossy green.

♀. Upper part of head black, with broad margins of glossy deep green; nape rufous-grey, slightly mottled with black; back, wings, and tail rufous; beneath the body pure white.

Length 6" 6", wings 3" 4".  
Batchian (*Wall. Coll.*) and Ternate.

This bird is very like the *M. lucida*, G. R. Gr., in its general appearances and colour; but it is less in all its proportions.

## MYIAGRA GALEATA.

B.M.

Head glossy greenish-black; back, wings, and tail grey, tinged with glossy green; beneath the body pure white.

Length 5" 6", wings 2" 6", bill from gape 8".  
Batchian.

*Myiagra manadensis* (Q. & G.). Amboyna.

## AMPELIDÆ.

## PACHYCEPHALA XANTHOCNEMIS.

Olivaceous brown, obscure on the head; wings fuscous black, margined with rufous brown; tail rufous brown; ear-coverts pale rufous; beneath the body rufous white, tinged with yellow on the abdomen; thighs and under tail-coverts yellow, slightly tinged with rufous; under wing-coverts white, tinged with rufous, and the bent of the wings beneath yellow; bill black; feet fuscous.

Length 6" 9", wings 3" 4".

Amboyna (*Wall. Coll.*).

## PACHYCEPHALA MELANURA.

B.M.

*Pachycephala melanura*, Gould, B. of Austr. ii. pl. 66.

*Turdus armillaris*, Temm.

*Lanius cucullatus*, Licht.

Batchian and Ternate.

*Myiolestes phaionotus*, Müll. Banda.

*Xenogenys azureus* (Temm.). Banda.

## CAMPEPHAGA MAGNIROSTRIS.

B.M.

*Graucalus magnirostris*, Forsten?; Pr. B. Consp. Av. i. p. 354?

Gilolo.

## CAMPEPHAGA MELANOLORA.

B.M.

Very like *C. mentalis*, Vig. & Horsf.; but the bill is much larger, being 1" 3½" from gape; quills and tail feathers margined, and the latter tipped with grey.

Length 11" 11"; wings 5" 11".

Batchian and Ternate.

## CAMPEPHAGA MELANOTIS.

Blue-grey; lores, ear-coverts, wings, and tail black; with the margins of the greater wing-coverts and quills and the two middle tail-feathers blue-grey, but the latter have black ends.

This bird is very like *Campephaga tenuirostris* (Jard. & Selby), but the bill is rather shorter and broader at its base; the bird itself is also less in all its proportions.

Length 9" 6", wings 4" 9".

Batchian and E. Gilolo (*Wall. Coll.*).

## CAMPEPHAGA (LALAGE) AUREA.

B.M.

*Cebblephyrus aureus*, Temm. Pl. Col. 382. f. 2; Voy. au Pôle Sud, Ois. t. 10. f. 3.

*Campephaga aurea*, G. R. Gray.

*Lalage aurea*, Pr. B. Consp. Av. p. 355.

Batchian and Ternate.

*Campephaga atriceps*, Müll. Ceram.

*Campephaga novæ guineæ* (Lath.). Molucca.

- Campephaga papuensis* (Gmel.). Banda.  
*Campephaga bicolor*, Temm. Banda.  
*Campephaga fimbriata*, Temm. Banda.  
*Campephaga ceramensis*, Pr. B. Ceram.  
*Pericronotus flammeus* (Forst.). Banda.

## ARTAMUS LEUCORHYNCHUS.

B.M.

*Artamus leucorhynchus* (Gm.), Pr. B.  
 Batchian and Gilolo.

*Artamus fuscus*, Vieill. Molucca.

## DICRURUS ATROCÆRULEUS.

Deep blue-black; the wings and tail and spots on the head and breast rich glossy green.

Length 13", wings 8" 9", bill from gape 1" 5".

Batchian and E. Gilolo (*Wall. Coll.*).

This species approaches most to the New Guinean bird in the form of its bill, but is larger in all its proportions, and is without the chalybeous spots on the back and abdomen.

## DICRURUS AMBOINENSIS.

Very like the *D. forficatus*; but the steel spots on the head and throat have a purplish hue, and the back and abdomen are less glossy.

Length 11" 9", wings 5" 8", bill from gape 1" 5".

Irides red.

Amboyna (*Wall. Coll.*).

This bird is most like the Javanese and Celebes examples in the form of its bill, though they all differ in their relative proportions from each other.

## LANIIDÆ.

*Tephrodornis gularis* (Raffl.). Banda.

## CORVIDÆ.

## CORVUS VALIDISSIMUS.

B.M.

*Corvus validissimus*, Schleg. Not. sur Corv. p. 12.  
 Batchian; Djilolo and Gilolo.

## CORVUS ENCA.

B.M.

*Corvus enca*, Horsf. Linn. Trans. xiii. p. 164.  
 Kaisa Island and Ternate.

*Corvus violaceus*, Temm. Ceram.

*Corvus validus*, Temm. Ceram.

*Crypsirina varians* (Lath.). Banda.

## PARADISIADÆ.

## SEMIOPTERA WALLACII.

B.M.

*Paradisea (Semioptera) wallacii*, G. R. Gray, Proc. Z. S. 1859, p. 130.

*Semioptera wallacei*, G. R. Gray; Gould, B. of Austr. Suppl. pt. 3; Sclat. Ibis, 1860, p. 26. pl. 2.

Batchian and E. Gilolo.

The Gilolo examples have the lateral pectoral plumes longer than those procured in the first instance from Batchian; yet they cannot be considered as more than a local variety.

## STURNIDÆ.

## LYCOCORAX PYRRHOPTERUS.

B.M.

*Corvus pyrrhopterus*, Temm. Mus. Lugd.; Pr. B. Consp. Av. i. p. 384.

*Lycocorax pyrrhopterus*, Pr. B. Compt. Rend. 1854.

*Pica pyrrhoptera*, Schl. Bijd. tot de Dierk. ii.

Batchian and Djilolo.

This species, in the form of its bill, agrees with those birds that compose the genus *Manucodia*, rather than with the *Corvidæ*, among which it is placed by Temminck and Schlegel.

## CALORNIS AMBOINENSIS.

B.M.

*Calornis amboinensis*, G. R. Gray, Proc. Z. S. 1858, p. 182.

*Calornis metallicus*, Pr. B. Consp. Av. p. 417; Voy. au Pôle Sud, Ois. t. 16. f. 2.

Amboyna and Ternate.

## CALORNIS OBSCURA.

B.M.

*Lamprotornis obscura*, Forsten; Pr. B. Consp. Av. p. 417.

Batchian; E. Gilolo.

## STURNIA PYRRHOPOGON.

*Lamprotornis pyrrhopogon*, Schleg. & Temm. Fauna Jap. p. 86. t. 46.

*Heterornis pyrrhogenys*, Müll.; Pr. B. Consp. Av. p. 418.

Batchian (*Wall. Coll.*).

## FRINGILLIDÆ.

## AMADINA MOLUCCA.

B.M.

*Loxia molucca*, L.

*Amadina molucca*, G. R. Gray.

*Munia molucca*, Bl.

Batchian and Ternate.

## BUCEROTIDÆ.

## BUCEROS RUFICOLLIS.

*Buceros ruficollis*, Vieill. ; Temm. Pl. Col. 557.

*Buceros plicatus*, Less. Tr. d'Orn. p. 445.

Batchian (*Wall. Coll.*).

*Buceros lunatus*, Temm. Banda.

*Buceros hydrocorax*, Linn. Molucca.

*Buceros exaratus*, Reinw. Molucca.

*Buceros payanensis* (Scop.). Molucca.

## PSITTACIDÆ.

## \*PLATYCERCUS HYPOPHONIUS.

B.M.

*Psittacus* (*Platycercus*) *hypophonius*, Müll. & Sehl. Verh. Nat. Gesch. Nederl. p. 181.

*Platycercus hypophonicus*, G. R. Gray, Gen. of B. ii. p. 408.

*Aprosmictus hypophonicus*, Pr. B. Rev. et Mag. de Zool. 1854, p. 153.

East Gilolo.

*Palæornis cyanocephalus* (Linn.). Ternate.

## LORIUS GARRULUS, var.

B.M.

*Psittacus garrulus*, Linn. S. N. i. p. 145.

*Psittacus garrulus*, var. *moluccensis*  $\gamma$ , Gmel. S. N. i. p. 334; Pl. Enl. 216.

*Domicella garrula*, Wagl. Monogr. Psitt. p. 570.

*Lorius garrulus*, Steph. Gen. Zool. xiv. p. 132.

Batchian and Djilolo.

The examples from Batchian are uniform in having a large sub-triangular spot of yellow between the shoulders; while those of Djilolo have the yellow spots on the back smaller, and the ends of the tail-feathers of a greenish-purple.

*Lorius domicella* (Linn.). Molucca.

*Lorius tricolor*, Steph. Molucca.

## EOS COCHINSINENSIS.

B.M.

*Psittacus cochinsinensis*, Lath. Ind. Orn. i. p. 116.

*Psittacus riciniatus*, Bechst.

*Psittacus cucullatus*, Shaw, Gen. Zool. viii. p. 461.

*Lorius cucullatus*, Steph. Gen. Zool. xiv. p. 132.

*Lorius isidorii*, Swains. Zool. Illustr. pl. .

*Eos cochinsinensis*, Wagl. Monogr. Psitt. p. 560.

*Eos riciniata*, Pr. B. Rev. et Mag. de Zool. 1854, p. 156.

*Eos isidorii*, G. R. Gray, Gen. of B. ii. p. 417.

Batchian and Gilolo.

## EOS RUBRA.

B.M.

*Psittacus borneus*, Linn. S. N. i. p. 141.

- Psittacus ruber*, Gmel. S. N. i. p. 335.  
*Psittacus moluccensis*, Lath. Ind. Orn. i. p. 116.  
*Psittacus cæruleatus*, Shaw, Nat. Misc. p. 937.  
*Psittacus cyanonotus*, Vieill. N. Dict. d'H. N. xxv. p. 334.  
*Eos rubra*, Wagl. Monogr. Psitt. p. 558.  
*Lorius borneus*, Steph. Gen. Zool. xiv. p. 132.  
 Amboyna.

- Eos indica* (Gmel.). Molucca.  
*Eos cyanogenia*, Pr. B. Molucca.  
*Eos semilarvata*, Pr. B. Molucca.  
*Eos squamata* (Bodd.). Bourou.  
*Eos unicolor* (Shaw). Molucca.  
*Eos ater* (Scop.). Amboyna.

## CORIPHILUS PLACENTIS.

B.M.

- Psittacus placentis*, Temm. Pl. Col. 553.  
*Conurus placens*, Bourj. Perr. t. 46.  
*Psittacus (Trichoglossus) placentis*, Müll. & Schl. Verh. Nat. Gesc. Nederl. Ind. p. 209.  
*Coriphilus placentis*, G. R. Gray, Gen. of B. ii. p. 417.  
*Psitteuteles placens*, Pr. B. Rev. et Mag. de Zool. 1854, p. 157.  
 Batchian and Djilolo.  
 These examples appear to be of a larger size than those obtained in New Guinea.

- Coriphilus solitarius* (Lath.). Molucca (ex Voy. Coqu.).

## TRICHOGLOSSUS CYANOGRAMMUS.

- Psittacus hæmatodus*, Bodd. Tabl. des Pl. Enl. d'Aubent. p. 4.  
*Psittacus hæmatotus*, Gmel. S. N. i. p. 316; Pl. Enl. 61.  
*Trichoglossus cyanogrammus*, Wagl. Monogr. Psitt. p. 554.  
 Amboyna.  
 The New-Guinean examples are smaller than those of Amboyna, but otherwise they are similar.

- Trichoglossus hæmatodus* (Linn.). Molucca.  
*Trichoglossus ornatus* (Linn.). Molucca.

## ECLECTUS GRANDIS.

B.M.

- Psittacus ceylonensis*, Bodd. Tabl. des Pl. Enl. d'Aubent. p. 3; Pl. Enl. 683 (var.).  
*Psittacus puniceus*, pt., Gmel. S. N. i. p. 335; Brown, Illustr. pl. 6.  
*Psittacus grandis*, Gmel. S. N. i. p. 683.  
*Eclectus grandis*, Wagl. Monogr. Psitt. p. 572.  
*Eclectus ceylonensis*, G. R. Gray, Gen. of B. ii. p. 418.  
*Psittacus (Psittacula) grandis*, Müll. & Schl. Verh. Nat. Gesch. Nederl. Ind. pp. 107, 108.  
 Kaisa Island and Gilolo.  
*Eclectus cornelia*, Pr. B. Ceram.  
*Eclectus cardinalis* (Bodd.). Amboyna; Ceram.

## ECLECTUS POLYCHLORUS, var.

*Psittacus polychlorus*, Scop. Del. Fl. et Fauna Insubr. p. 87; Sonn. Voy. t. 108.

*Psittacus magnus*, Gmel. S. N. i. p. 344.

*Psittacus sinensis*, Gmel. S. N. i. p. 337; Edw. Birds, pl. 231.

Batchian and Gilolo (*Wall. Coll.*).

*Eclectus intermedius* (Pr. B.). Molucca.

*Eclectus westermanni* (Pr. B.). Molucca.

## TANYGNATHUS MEGALORHYNCHUS.

B.M.

*Psittacus megalorhynchus*, Bodd. Tabl. des Pl. Enl. d'Aubent. p. 45; Pl. Enl. 713.

*Psittacus macrorhynchus*, Gmel. S. N. i. p. 338.

*Psittacus nasutus*, Lath. Ind. Orn. i. p. 118.

*Tanygnathus macrorhynchus*, Wagl. Monogr. Psitt. p. 677.

Batchian and Gilolo.

*Tanygnathus gramineus* (Gmel.). Amboyna.

## PSITTACUS (GEOFFROIUS) PERSONATUS.

B.M.

*Psittacus personatus*, Shaw, Gen. Zool. viii. p. 544; Levaill. Perr. t. 112, 113.

*Psittacus geoffroyanus*, Vieill. N. Dict. d'H. N. xxv. p. 311.

*Psittacus geoffroyi*, (Vail.) Kuhl, Consp. Psitt. p. 85.

Amboyna; Molucca.

## PSITTACUS (GEOFFROIUS) CYANEICOLLIS.

B.M.

*Psittacus cyanicollis*, Müll. & Schl. Verhandl. Nat. Gesch. Nederl. Ind. p. 108.

*Psittacus (Psittacula) cyanicollis*, Müll. & Schl.

*Geoffroyus cyanicollis*, Pr. B. Consp. Av. p. 6.

Batchian and Gilolo.

*Psittacus fuscicapillus*, Vieill. Bourou.

## CACATUA CRISTATA.

*Psittacus cristatus*, Linn. S. N. i. p. 143.

*Cacatua cristata*, Vieill. N. Dict. d'H. N. xvii. p. 10.

*Cacatua leucolopha*, Less. Tr. d'Orn. p. 182.

*Kakadoe cristata* vel *albocristata*, Bourg. Perr. t. 82.

Batchian and Ternate (*Wall. Coll.*).

*Cacatua moluccensis* (Gmel.). Molucca.

*Cacatua sulphurata* (Gmel.). Bourou.

## PICIDÆ.

*Megalaima australis* (Horsf.). Banda.

*Megalaima philippensis* (Gmel.). Molucca.

*Picus (Hemicircus) concretus*, Reinw. Banda.



## CUCULIDÆ.

## CENTROPUS GOLIATH. B.M.

*Centropus goliath*, Forsten; Pr. B. Consp. Av. p. 108.  
Batchian and Gilolo.

*Centropus medius*, Müll. Amboyna.  
*Centropus bicolor*, Less. (ex Bl.). Gilolo.

## SCYTHROPS NOVÆ HOLLANDIÆ. B.M.

*Scythrops novæ hollandiæ*, Lath.  
*Cuculus præsagus*, Reinw.  
Batchian.

## CUCULUS CANOROÏDES. B.M.

*Cuculus canoroïdes*, Müll. Verh. Nat. Gesch. p. 235.  
Batchian.

## CUCULUS (CACOMANTIS) SEPULCRALIS. B.M.

*Cuculus sepulcralis*, Müll. ?  
*Cacomantis sepulcralis*, Pr. B. ?  
Batchian.

## \*CUCULUS (CACOMANTIS) TYMBONOTUS.

*Cuculus tymbonotus*, Müll. ?  
*Cacomantis tymbonotus*, Pr. B. ?  
Ternate (*Wall. Coll.*).  
*Cuculus poliogaster*, Müll. Ternate.  
*Chrysococcyx lucidus* (Gmel.). Amboyna.  
*Eudynamis ransomi*, Pr. B. Ceram.  
*Eudynamis punctatus*. Amboyna.

## \*EUDYNAMIS PICATUS.

*Eudynamis picatus*, Müll. Verh. Nat. Gesch. Nederl. p. 167.  
Ternate (*Wall. Coll.*); Amboyna.

## COLUMBIDÆ.

## PTILONOPUS (IOTRERON) IOGASTER. B.M.

*Columba hyogastra*, Reinw. Pl. Col. 252.  
*Columba iogaster*, Wagl.  
*Ptilonopus hyogaster*, G. R. Gray, Gen. of B. ii. p. 466  
*Treron ionogaster*, Reichenb.  
*Iotreron iogastra*, Pr. B. Consp. Av. ii. p. 25.  
Batchian and Gilolo (Celebes, *Reinw.*).

## PTILONOPUS (CYANOTRERON) MONACHUS. B.M.

*Columba monacha*, Reinw. Pl. Col. 253; Knip. Fig. t. 53.  
*Ptilonopus monachus*, G. R. Gray, Gen. of B. ii. p. 466.  
*Cyanotreron monachus*, Pr. B. Consp. Av. ii. p. 24.  
Kaisa Island and Ternate.

## PTILONOPUS (LAMPROTRETERON) SUPERBUS.

*Columba superba*, Temm. Fig. t. 33.

*Ptilonopus superbus*, Steph. Gen. Zool. xiv. p. 279.

*Lamprotreron superba*, Pr. B. Consp. Av. ii. p. 18.

Batchian and E. Gilolo (*Wall. Coll.*); Amboyna; Ternate.

The bird from Batchian appears to be a trifle larger than that from Amboyna, and the band on the breast is also broader; while that from the Aru Islands is similar, but altogether smaller. *Ptilonopus cyanovirens* ♂ (?), Less., is probably the ♀ of this variety, Knip. & Prev. Fig. t. 8. The Australian specimens are very similar in size to the Amboyna examples; but the band on the breast has a distinct mixture of green within it.

The Celebes specimens are those of a decidedly distinct species, and are at once distinguished by the purplish-grey breast and the deep green band on the lower part of the latter; the female has, according to Mr. Wallace's specimens of that sex, the top of the head of a deep purple, with deep bluish-green intermixed; while on the head of the true *P. superbus* it is of the same colour as the spot on the shoulder of the wings. I have named the Celebes bird *Ptilonopus formosus*; the ♀ is represented as *Columba superba*, Knip. & Prev. Fig. t. 42.

*Ptilonopus porphyreus*, Temm. Molucca.

*Ptilonopus diadematus*, Temm. Banda.

*Ptilonopus viridis* (Linn.). Amboyna.

*Treron aromatica*, Temm. Amboyna.

*Treron vernans*, Temm. Banda.

## \*CARPOPHAGA (MEGALOPREPIA) FORMOSA.

B.M.

♂. Emerald green, each feather of the body margined with golden and washed with white on the nape and breast; head greenish-white, varied with yellow; lower part of breast with a rich carmine spot; abdomen orange-yellow; lower tail-coverts rufous orange-yellow.

♀. Similar to the male; but without the carmine spot on the breast.

Length 11" 3<sup>'''</sup>, wings 5" 9<sup>'''</sup>.

East Gilolo.

## CARPOPHAGA (DUCULA) BASALIS.

B.M.

*Columba basalis*, Temm.

*Carpophaga basalica*, Sundev.

*Ducula basalis*, Pr. Bp. Consp. Av. ii. p. 35.

Batchian and Gilolo.

## CARPOPHAGA PERSPICILLATA.

B.M.

*Columba perspicillata*, Temm. Pl. Col. 246.

*Carpophaga perspicillata*, G. R. Gray, List of Gall. B.M. p. 6.

Batchian, Kaisa Island, and Gilolo.

The Amboyna specimen differs in having the head, neck, and

breast greyish-white, but is a little darker on the back of the neck ; the back is of a more golden-green, while the wings are of a more decided grey.

CARPOPHAGA (MYRISTICIVORA) MELANURA ?

♀. Differs from *Carpophaga luctuosa*, as described and figured by Temminek, Pl. Col. 247, in having the tail of a more uniform black colour, with the inner webs of each feather only white ; this latter colour decreases in depth to the middle feathers, and the quills are of a uniform black. It is of a much smaller size, but is otherwise like *C. luctuosa*.

Batchian and Djilolo (*Wall. Coll.*).

*Carpophaga alba* (Gmel.). Molucca.

*Carpophaga ænea*, Temm. Molucca.

\*CARPOPHAGA ALBOGULARIS.

B.M.

*Carpophaga albogularis*, Temm.

*Janthænas albogularis*, Pr. B. Consp. Av. ii. p. 44.

*Janthænas halmakeira*, Pr. B.

East Gilolo.

MACROPYGGIA AMBOINENSIS.

*Columba amboinensis*, Linn.

*Macropygia amboinensis*, G. R. Gray, List of Gen. of B. 1840, p. 58.

Amboyna (*Wall. Coll.*).

MACROPYGGIA ALBICAPILLA, var.

B.M.

*Columba albicapilla*, Temm. MSS.

*Macropygia albicapilla*, Pr. Bp. Consp. Av. ii. p. 57.

Batchian and Ternate.

MACROPYGGIA (REINWARDTÆNA) REINWARDTII.

B.M.

*Columba reinwardtii*, Temm. Pl. Col. 248.

*Macropygia reinwardtii*, Swains. Classif. of B. ii. p. 349.

*Reinwardtæna typica*, Pr. Bp. Consp. Av. ii. p. 59.

Batchian and Djilolo (Celebes, *Temm.*).

*Macropygia leptogrammica*, Temm. Amboyna.

*Turtur bitorquatus*, Temm. Molucca.

TURTUR SURATENSIS.

*Columba suratensis*, Lath.

*Turtur tigrina*, Temm.

Ternate and Amboyna (*Wall. Coll.*).

CHALCOPHAPS MOLUCCENSIS.

B.M.

*Chalcophaps javanica*, Auct.

Front white ; top of head bronzy-brown ; occiput grey ; streak

over eye greyish-white; cheeks, neck, and breast, and beneath the wings cinnamonous-red; scapulars and wings rich emerald-green, varied in places with golden colour; back rich bronzy-black, with two bands of grey; rump, tail-coverts, and tail bronzy-black; the lateral feathers of latter grey, with black ends and grey margins; under tail-coverts deep black; vent greyish; abdomen rufous-brown.

Length 11", wings 5" 10"', bill from gape 11"'.  
Amboyna and Batchian.

**CALENAS NICOBARICA.**

B.M.

*Columba nicobarica*, Linn. S. N. i. p. 288.

*Columba gallus*, Wagl. Syst. Av. Col. sp. 113.

*Calenas nicobarica*, G. R. Gray, List of Gen. of B. 1840, p. 59.  
Batchian and E. Gilolo (*Wall. Coll.*).

*Goura coronata* (Linn.). Banda.

**MEGAPODIDÆ.**

**MEGAPODIUS FREYCINETI.**

B.M.

*Megapodius freycineti*, Quoy & Gaim. Voy. Uranie, ii. p. 125.  
t. 32.

*Megapodius freycineti*, Pl. Col. 220.

Juv. *Alecthelia urvillii*, Less. Voy. de la Coqu. i. p. 703. t. 37.

Kaisa Island, Batchian, and Gilolo.

**MEGAPODIUS FORSTENI.**

B.M.

*Megapodius forsteni*, Temm. MSS.; G. R. Gray & Mitch. Gen.  
of B. iii. pl. 124.

Amboyna.

**\*MEGAPODIUS WALLACEI. (Pl. CLXXI.)**

B.M.

Front of head and throat greyish olivaceous-brown; hind part of head castaneous-brown; nape and upper part of back olivaceous, slightly vermiculated with black; middle of back, greater wing-coverts and external web of some of the tertials, deep castaneous, with most of the feathers margined with slate-colour; rump, upper tail-coverts, breast, and abdomen slate-colour; lesser wing-coverts, tertials, and tail pale olivaceous-brown; middle of abdomen pure white; primaries brownish-black, spotted or partly margined on the outer webs with buff-white. Bill yellow; feet horn-colour or black.

Length 13", wings 7" 6"'.  
East Gilolo.

This bird differs from all its congeners in the variability of its coloration, a peculiarity which imparts much interest to this new discovery of Mr. Wallace.

**STRUTHIONIDÆ.**

*Casuaris emeu*, Lath. Ceram; Banda.

## CHARADRIADÆ.

## \*SQUATAROLA HELVETICA, var.

*Tringa helvetica*, Linn.*Vanellus melanogaster*, Bechst.East Gilolo (*Wall. Coll.*).

## CHARADRIUS GEOFFROYI.

*Charadrius geoffroyi*, Wagl.*Hiaticula inornata*, Gould?East Gilolo (*Wall. Coll.*).

## CHARADRIUS CIRRHIPEDESMUS.

*Charadrius cirrhipedesmus*, Wagl.East Gilolo (*Wall. Coll.*).

## CHARADRIUS LONGIPES.

B.M.

*Charadrius fluviialis orientalis*, Temm. & Schl. Fauna Jap. p. 105.  
t. 62?Batchian (*Wall. Coll.*).*Edicnemus magnirostris*, Geoffr. Molucca.*Glareola grallaria*, Temm. Molucca.

## \*CINCLUS INTERPRES.

*Tringa interpres*, Linn.*Strepsilas interpres*, Leach.*Strepsilas collaris*, Temm.East Gilolo (*Wall. Coll.*).

## ARDEIDÆ.

## ARDEA TYPHON.

*Ardea typhon*, Temm.?*Ardea robusta*, Müll.*Typhon temminckii*, Reichenb.*Typhon robusta*, Pr. B.Batchian (*Wall. Coll.*).

## \*ARDEA (EGRETTA) ALBA?

*Ardea alba*, Linn.*Ardea systematophorus*, Gould.Ternate (*Wall. Coll.*).

## ARDEA (ARDEOLA) RUSSATA.

*Ardea russata*, Temm.*Ardea coromandelica*, Licht.*Ardea coromandelensis*, Steph.*Bubulcus coromandelensis*, Pr. B. Consp. Av. ii. p. 125.Batchian (*Wall. Coll.*).

## ARDEA (ARDETTA) FLAVICOLLIS.

*Ardea flavicollis*, Lath. Ind. Orn. ii. p. 701.*Ardea nigra*, Vieill.*Ardetta flavicollis*, Bl.*Herodias flavicollis*, Cab.Batchian (*Wall. Coll.*).*Ardea novæ hollandiæ*, Lath. Molucca.

## \*ARDEA (BUTORIDES) VIRIDICEPS.

*Ardea javanica*, Bl.*Ardea scapularis*, Schl.*Ardea chloriceps*, Hodgs.East Gilolo (*Wall. Coll.*).*Argala javanica* (Horsf.). Molucca.*Ibis peregrinus*. Molucca.

## \*NYCTICORAX CALEDONICUS.

*Ardea caledonica*, Lath.Gilolo (*Wall. Coll.*).

## SCOLOPACIDÆ.

## \*NUMENIUS AUSTRALASIANUS ?

*Numenius australasianus*, Gould.East Gilolo (*Wall. Coll.*).

## NUMENIUS MINOR.

*Numenius minor*, Müll. & Schl. ?Batchian (*Wall. Coll.*); Amboyna.

## \*LIMOSA LAPPONICA, var.

East Gilolo (*Wall. Coll.*).

## \*TOTANUS (GLOTTIS) HORSFIELDI ?

*Totanus horsfieldi*, Sykes.East Gilolo (*Wall. Coll.*).

## TOTANUS GRISEOPYGIUS.

*Totanus griseopygius*, Gould, B. of Austr.*Totanus pulverulentus*, Temm. & Schl. Fauna Jap. p. 109. t. 65.*Actitis brevipes* (Vieill.), Bl.*Gambetta griseopygia*, Pr. B.Batchian (*Wall. Coll.*).

## TOTANUS (TRINGOIDES) HYPOLEUCUS ?

B.M.

*Tringa hypoleuca*, Linn. S. N. i. p. 250.*Totanus hypoleucus*, Temm. Man. d'Orn. 1815, p. 424.*Actitis hypoleucus*, Boiç, Isis, 1822, p. 649.

*Tringoides hypoleuca*, G. R. Gray, List of Gen. of B. 1841, p. 88.

*Actitis schlegeli*, Pr. B. Compt. Rend. 1856, p. ?

Batchian.

*Tringa subarquata*, Gmel. Molucca.

#### SCOLOPAX UNICLAVATUS.

*Scolopax burka*, Lath. MSS.

*Scolopax uniclavatus*, Hodgs. Journ. A. S. B. 1837, p. 492.

*Gallinago burka*, Pr. B. Compt. Rend. 1856, p. .

*Gallinago scolopacinus* (Pr. B.), Bl. Cat. of B. p. 272.

*Gallinago media*, Hodgs., Gray's Zool. Misc. p. 86.

Batchian (*Wall. Coll.*).

#### PALAMEDEIDÆ.

*Parra gallinacea*, Temm. Banda; Molucca.

#### RALLIDÆ.

*Porphyrio smaragdinus*, Temm. Banda.

#### HABROPTILA.

Bill longer than the head, strong, with the culmen at the base elevated, broad, rounded posteriorly, and gradually descending towards the tip, which is suddenly curved; the sides compressed to the tip, which is slightly emarginated; the gonys moderate, slightly angulated and advancing upwards; nostrils placed in a membranous groove, which extends beyond the middle of the bill, with the opening linear and near the base of the groove. Wings very short, lax, with the fourth to the seventh quills equal and longest. Tail very short and lax. Tarsi robust, as long as the middle toe, and covered with transverse scales. Toes rather robust and long; the lateral toes equal, the hind toe moderate and strong. Claws moderate and compressed. Plumage in general very lax. The wings armed at the bend of the shoulder with a small spine.

#### HABROPTILA WALLACII. (Pl. CLXXII.)

Slate-colour, with a mixture of olivaceous-brown on the body, wings, and upper tail-coverts; tail and quills black; bill and feet red.

Length 16", wings 7" 6"', bill 3", tarsi 3" 2"'.  
East Gilolo (*Wall. Coll.*).

This curious bird approaches the *Ocydromi* in the shortness and softness of its wings; the feet are those of a *Porphyrio*. Yet its general appearance might cause it to be taken, at first sight, for a species of *Hæmatopus*.

#### ANATIDÆ.

##### TADORNA RADJAH.

B.M.

*Anas leucomelas*, Garn.

*Anas radjah*, Garn. Voy. de la Coqu. Zool. i. p. 602. t. 49.

*Radja eytoni*, Reichenb.

Batchian, E. Gilolo (*Wall. Coll.*), and Bourou.

The Australian specimens differ from these in being more rufous on the upper part of the back.

*Dendrocygna badia*. Molucca.

COLYMBIDÆ.

\**PODICEPS* (SYLBEOCYCLUS) *TRICOLOR*. B.M.

Like *P. minor*, but with a very slight appearance of the black on the mentum; the bill is longer; upper surface of a deep æneous black; cheeks and front of throat deep rufous; under surface æneous black mottled with rufous white.

Ternate.

LARIDÆ.

*STERNA VELOX*? B.M.

Batchian; Amboyna.

PELECANIDÆ.

\**SULA FIBER*.

*Pelecanus fiber*, Linn.

*Sula fiber*, G. R. Gray.

N. E. Gilolo (*Wall. Coll.*).

*GRACULUS MELANOLEUCUS*. B.M.

*Phalacrocorax melanoleucus*, Vieill. N. Dict. H. N. viii. p. 88.

*Phalacrocorax flavirostris*, Gould.

*Pelecanus dimidiatus*, Cuv.

Batchian.

*GRACULUS SULCIROSTRIS*.

*Carbo sulcirostris*, Temm.

Batchian (*Wall. Coll.*); Amboyna.

8. DESCRIPTION OF NEW SPECIES OF MITRA FROM THE COLLECTION OF HUGH CUMING, ESQ. BY H. DOHRN.

*MITRA PIA*. *Testa fusiformis, costis crebris, spiralibus, subregulariter distantibus, flavis, nitidis, elatis; interstitia liris minoribus intercostariis et longitudinalibus angustissimis reticulata; alba; sutura distincta; anfr. 7-8 parum convexi, lente accrescentes, ultimus magnus, subtus attenuatus, vix recurvus. Apertura fusiformis, intus alba; columella 4-plicata.*

Long. 58, lat. 18; ap. long. 34, lat. 8 mill.

*Hab.* Australia.

*MITRA PEASEI*. *Testa subulato-fusiformis, hyalino-albida, spiraliter obsolete crebricostata, subtilissime longitudinaliter striata; sutura simplex; anfr. 8 planiusculi, ultimus paulo ventrosior, subrecurvus; apertura fusiformis; columella 5-plicata.*

Long. 37, lat. 11; ap. long. 20, lat. 5 mill.

*Hab.* Australia.



**MITRA AUTUMNALIS.** *Testa turrita, parum nitida, longitudinaliter acute et anguste costata, spiraliter subremote lirata, albina, maculis fuscis nebulosa, supra medium anfractuum albizonata; anfr. 8 subplani, ultimus basi rude plicatus; apertura elongata; columella 4-plicata.*

Long. 18, lat. 9; ap. long.  $5\frac{1}{2}$ , lat.  $3\frac{3}{4}$  mill.

*Hab.* Nova Caledonia.

**MITRA ANTONELLII.** *Testa oblongo-fusiformis, fusca, costis spiralibus, apicem versus evanescentibus, longitudinalibus validis, griseis, fenestrata, fascia alba supra medium cingulata, nitens; sutura distincta; anfr. 8-9 vix convexiusculi, ultimus  $\frac{1}{2}$  longitudinis æquans, subrecurvus; labrum callo dentiformi junctum, intus crenatum; apertura fusca, dentibus 5 columellaribus armata.*

Long. 27, lat. 9; ap. long.  $13\frac{1}{2}$ , lat. 4 mill.

*Hab.* Philippine Islands.

Allied to *M. obeliscus*, Reeve.

**MITRA ASTYAGIS.** *Testa conoidea, lævigata, nitida, sub epidermide cinereo-viridi cærulescens, apice fusciscente, prope suturam subacutely carinata, carina interrupte fusco cingulata; spira acuminata; anfr. 7-8 convexiusculi, ultimus latus,  $\frac{3}{4}$  longitudinis æquans, ad basin pauci-liratus; apertura linealis, callosa, intus fusco-ferruginea, labro albo; columella 4-plicata.*

Long. 26, lat. 10; ap. long. 18, lat. 3 mill.

*Hab.* New Caledonia.

Readily distinguished from *M. bacillum*.

**MITRA CYRI.** *Testa fusiformis, spiraliter late striata, nitida, alba, seriatim maculis quadratis fuscis picta; sutura simplex; spira mucronata; anfr. 8-9 lente accrescentes, convexiusculi, ultimus  $\frac{3}{4}$  longitudinis æquans, ad suturam subangulatus; apertura alba, elongata, angusta; columella 4-plicata.*

Long. 18, lat.  $4\frac{1}{2}$ ; ap. long. 10, lat.  $1\frac{1}{2}$  mill.

*Hab.* New Caledonia.

Agrees in some respects with *M. fulgetrum*; distinguished by the smooth spiral lines, colouring, &c.

✓ **MITRA WISEMANI.** *Testa ovato-turrita, longitudinaliter arcuato-costata, spiraliter sulcata, interstitiis granosis, alba, fulvo medio interrupte unifasciata; sutura distincta; anfr. 7-8 planiusculi, supra medium subangulati, lente accrescentes, ultimus basi contractus; apertura alba, oblonga; columella 4-plicata.*

Long. 25, lat. 10; ap. long. 12, lat.  $5\frac{1}{2}$  mill.

*Hab.* Sandwich Islands.

Nearly allied to *M. arenosa*, Lam.

**MITRA JUDÆORUM.** *Testa elongato-ovata, plicis longitudinalibus, sulcis spiralibus ornata, parum nitida, aurantiaco-fulva,*

*plicis et basi columellari albis, varie albo et fusco fasciata vel punctata; sutura distincta; spira acuminata; anfr. 8 convexi, lente accrescentes, ultimus basi vix recurvus; apertura angusta, cærulescens, intus fusca, crenata; labrum callo crasso junctum; columella plicis 4 validis armata.*

Long. 22, lat. 8; ap. long. 10, lat. 3 mill.

*Hab.* Red Sea.

This fine species approaches *M. cruentata*, Chem., in general aspect.

**MITRA SAMUELIS.** *Testa oblongo-ovata, solida, fulvo-viridis, spiraliter remote fusco lirata, subtilissime decussata; sutura marginata; anfr. 7-8 plani, ultimus antice ascendens; apertura angusta, intus cærulescens; labrum incrassatum, album, denticulatum; columella 4-plicata.*

Long. 28, lat. 10; ap. long. 15, lat. 5 mill.

*Hab.* Sandwich Islands.

**MITRA PLEBEIA.** *Testa elongato-oblonga, apice acuto, subremote spiraliter striata, albescens, maculis fulvis vel fuscis nebuloosa; sutura simplex; anfr. 7-8 subplani, lente accrescentes, ultimus basi attenuatus; apertura albida; columella 5-plicata.*

Long. 23, lat. 8; ap. long. 12, lat. 3½ mill.

*Hab.* Sandwich Islands.

**MITRA ANTONI.** *Testa acuminato-ovata, nitida, spiraliter anguste sulcata, unicolor flavida, apice albescente; sutura marginata; anfr. 6 planiusculi, ultimus ventrosior, medio subangulatus; apertura albescens, ovato-rhombea, labro crenato; columella 4-plicata.*

Long. 20, lat. 8; ap. long. 10, lat. 3 mill.

*Hab.* Sandwich Islands.

**MITRA GIBBA.** *Testa acuminato-ovata, solida, lævis, sub epidermide cornea unicolor fusca, obsoletissime raro lirata; sutura crenata; anfr. 6 planiusculi, ultimus antice descendens, pone aperturam gibbus, basi distinctius liratus; apertura intus cærulescenti-albida; labrum callosum, crenulatum; columella 4-plicata.*

Long. 27, lat. 12; ap. long. 14½, lat. 4 mill.

*Hab.* New Caledonia.

**MITRA NUX-AVELLANA.** *Testa ovata, solida, albina, fusco maculata, spiraliter sulcata, longitudinaliter striata; sutura indistincta; anfr. 5 convexiusculi, apice obtuso, ultimus magnus, ventrosus, basi minime recurvus; apertura pyriformis; columella 4-plicata.*

Long. 15, lat. 8½; ap. long. 10½, lat. 3 mill.

*Hab.* Sandwich Islands.

Allied to *M. texturata*.

## 8. ON TWO NEW GENERA OF ACEPHALOUS MOLLUSKS.

BY HENRY ADAMS, F.L.S.

My attention having been lately directed to the genera *Cultellus* and *Macoma*, the former belonging to the *Solenidæ*, and the latter to the *Tellinidæ*, both families of Acephalous Mollusca, it may, I think, be interesting to point out two species hitherto included in those genera, viz. *Cultellus cultellus* and *Macoma bruguieri*, which are so aberrant in their characters as to render it desirable that they should be constituted the types of distinct groups. The former may be considered a genus, for which I would propose the name *Ensiculus*, and the latter a subgenus of *Macoma*, and be distinguished under the name *Macalia*.

## Genus ENSICULUS, H. Adams.

*Testa tenuis, transverse elongata, arcuata, utraque extremitate rotundata et hiante; umbonibus subanterioribus, interne costa brevi curvataque firmatis. Cardo in dextra valva duobus dentibus, in sinistra valva tribus dentibus instructus. Anterior impressio muscularis subtrigonalis; sinus pallialis brevis et latus.*

## E. CULTELLUS, Linn.

Shell thin, transversely elongated, arcuated, rounded and gaping at each end; beaks sub-anterior, strengthened internally by a short curved rib. Hinge composed of two teeth in the right, and three in the left valve. Anterior muscular impression subtrigonal; pallial sinus short, wide.

This genus is most nearly allied to *Cultellus*, but differs from it in its arcuated and more elongated and parallel form, and in the strengthening callus of the umbo being short and curved.

The genus *Macoma*, I would observe, will probably, when an opportunity of examining the animal of *Gastrana* shall occur, be found, as pointed out by Mr. Clark in his 'British Mollusca,' to have closer relations with *Gastrana* than with *Tellina*; and the chief peculiarity of *Macalia*, as distinguishing it from *Macoma* proper,—viz. the large size and strength of the hinge-teeth, which are strikingly similar to those of *Gastrana*,—tends to confirm this opinion. The general form of *Macalia*, however, which is subrotundate and compressed, together with the solidity of the shell, prevents its being included in that genus. The entire absence of lateral teeth serves to distinguish the species of *Macoma* and *Gastrana* from the *Tellinæ*.

I may take this opportunity of referring to a paper by Mr. Pease lately read before the Society, in which he describes a new *Vexilla* from the Sandwich Islands under the name of *V. nigro-fusca*; and, as the species hitherto recorded of the genus are few in number, this addition is interesting. The shell in question, however, differs from the typical species, in the spire being acuminate, and in the aperture being somewhat contracted or narrowed, and should, I think, be regarded as the type of a subgenus, which might be named *Usilla*.

9. ON SOME NEW SPECIES OF NUCULACEÆ IN THE COLLECTION  
OF HUGH CUMING, ESQ. BY SYLVANUS HANLEY.

**LEDA TAYLORI.** *Testa elongata, antice aliquantum brevior et rotundato-lanceolata, postice attenuata et subrostrata; subtenuis, compressa, nivea, densius longitudinaliter striata; striæ antice concentricæ et elevatæ, mox acclinatæ et (certissime in valvula sinistra, ubi inferne prope plicam umbonalem planulatam demumque sublævigatam prorsus desunt) magis minusve obliquæ. Margo dorsalis uterque vix declivis; anticus convexiusculus, posticus subretusus. Margo ventralis multum arcuatus, utrinque subæqualiter acclivis. Nates vix eminentes. Area dorsalis postica angusta, planulata, margine plicæ umbonalis depressæ crenulato et valde prominente perspicue circumscripta; area dorsalis antica concentricè striata, subinconspicua.*

Long.  $1\frac{1}{2}$ , lat.  $\frac{1}{3}$  poll.

Hab. Guatemala.

Of the only three examples known to me, one belongs to Mr. Taylor and two to Mr. Cuming. The species approaches *L. crenifera* and *L. electa*.

**LEDA METCALFII.** *Testa elongata, valde inæquilateralis, postice rostrata, compressa, albida, plicæ umbonalis elevatæ expers, longitudinaliter striata (vel corrugata): striæ densæ et argutæ ante radium anticum impressum remotiores et lamellosæ, postice autem elevatæ et valde obliquæ. Extremitas lateris antici brevioris subangulata, superne eminentior, inferne oblique rotundata, lateris postici, sensim sed valde attenuati, angusta, obliqua, subtruncata, recurvata. Margines dorsales paululum declives: anticus convexiusculus; posticus subrectus, denique autem incurvatus. Margo ventralis utrinque valde acclivis, antice oblique arcuatus, postice convexus. Nates acutæ, satis prominentes. Area dorsales sicut in *L. crenifera*.*

Long.  $\frac{2}{3}$ , lat.  $\frac{1}{4}$  poll.

Hab. — ?

Mus. Cuming, Hanley.

This graceful shell, of which only two, and scarcely full-grown, individuals are known to me, reminds one of *L. crenifera* and the young of *L. electa*. In the larger only of the specimens do the oblique striæ extend to the crenated ridge.

**YOLDIA WOODWARDI.** *Testa subelliptica, valde inæquilateralis, multum compressa, pertenuis, utrinque (præsertim antice) hians, epidermide tecta valida, nitida, flavescendo-olivacea, plicæ umbonalis et radii impressi antici expers, sublævigata, rugis incrementi tantum notata. Extremitas lateris antici, producti, inconcinne rotundata; lateris postici brevis rotundato-acuminata, et supra, potius quam infra medium sita. Margo dorsalis anticus vix declivis, principio subrectus, demum convexus; posticus declivis, subrectus; ventralis antice arcuatus et multum acclivis, in medio late convexus, postice subarcuatim acclivis.*

*Nates parvæ, acutissimæ, tamen haud prominentes. Arcæ dorsales haud circumscriptæ; antica planulata; postica labia carinata-protrusa.*

Long.  $1\frac{1}{3}$ , poll., lat.  $\frac{7}{13}$  poll.

*Hab.* Apud insulas Falklandicas.

*Mus.* Cuming, Taylor, Hanley.

There are only from eight to ten teeth on one side of the cartilage-pit, and from ten to twelve on the other. I have named the species in honour of Mr. Woodward, who has delineated the animal (as *Foldia*, n. sp.) in his admirable 'Manual of the Mollusca' (p. 270).

The following list of additions made to the Menagerie by gift and purchase, during the month of May, was read:—

1 pair of Doves.....	<i>Turtur risorius</i> .....	Presented by	Mrs. Low.
3 Lobsters.....	<i>Homarus vulgaris</i> .....		A. Arcedeckne, Esq., F.Z.S.
9 Australian Serpents .....	{ <i>Hoplocephalus superbus</i> .. } { <i>Pseudechis porphyriaca</i> .. }		Edward Wilson, Esq.
1 Madagascar Tortoise.....	<i>Testudo radiata</i> .....		H. E. Dresser, Esq.
2 Kingfishers.....	<i>Dacelo gigas</i> .....		Edward Wilson, Esq.
1 Yellow-bellied Snake .....	<i>Hoplocephalus superbus</i> .....		Edward Wilson, Esq.
2 Mona Monkeys .....	<i>Cercopithecus mona</i> .....		A. P. French, Esq.
1 South American Lizard .....	<i>Sceloporus chlorolepidotis</i> ..		Mr. Jamrach.
1 Leopard .....	<i>Felis leopardus</i> .....		H.R.H. the Infanta Duke de Oporto.
4 Chestnut-breasted Finches..	<i>Donacola castaneothorax</i> .....		Alf. Denison, Esq., F.Z.S.
2 Portuguese Foxes .....	<i>Vulpes vulgaris</i> .....		C. Pringle, Esq.
1 Wanderoo Monkey .....	<i>Silenus vetus</i> .....		J. Pittman, Esq.
1 Gannett .....	<i>Sula bassana</i> .....		J. H. Hunt, Esq.
1 Common Adder.....	<i>Pelias berus</i> .....		James Murton, Esq.
1 Cat (from Carthage).....	<i>Felis</i> — ? .....		A. F. Hurt, Esq.
1 Common Badger .....	<i>Meles taxus</i> .....		J. T. Sharp, Esq.
1 Australian Goshawk .....	<i>Astur novæ hollandiæ</i> .....		P. Frazer, Esq., Corr. Mem.
1 Kangaroo Rat .....	<i>Bettongia cuniculus</i> .....		P. Frazer, Esq., Corr. Mem.
1 Herring Gull .....	<i>Larus argentatus</i> .....		Lady Hill.
6 Kingfishers.....	<i>Alcedo ispida</i> .....		E. Lukyn, Esq.
1 Beaver .....	<i>Castor americanus</i> .....	Earl of Southesk, F.Z.S.	
2 Philantomba Antelopes.....	<i>Cephalophus maxwellii</i> .....	Visc. Powerscourt, F.Z.S.	
1 Australian Wild Duck .....	<i>Anas superciliosa</i> .....	Edward Wilson, Esq.	
1 Australian Water-hen .....	<i>Porphyrio melanotus</i> .....	Edward Wilson, Esq.	
6 Yellow Wagtails .....	<i>Budytes rayi</i> .....	Purchased.	
1 Ring Ouzel.....	<i>Turdus torquatus</i> .....		
3 Red-tailed Finches.....	<i>Estrela ruficauda</i> .....		
4 Many-coloured Parrakeet ..	<i>Psephotus multicolor</i> .....		
3 Adelaide Parrakeets .....	<i>Platycercus adelaidæ</i> .....		
1 Red-fronted Parrakeets .....	<i>Trichoglossus concinnus</i> .....		
1 Golden Eagle.....	<i>Aquila chrysaetos</i> .....		
1 Rufous-bellied Wallaby.....	<i>Halmaturus thetidis</i> .....		
2 Spotted Emeus .....	<i>Dromæus irroratus</i> .....		
1 Vicuna .....	<i>Lama vicuna</i> .....		
1 Triton Cockatoo .....	<i>Cacatua triton</i> .....		
1 Severe Ara .....	<i>Ara severa</i> .....		
1 Cuban Capromys .....	<i>Capromys prehensilis</i> .....		
3 Red Birds .....	<i>Pyrranga æstiva</i> .....		
2 White-winged Doves.....	<i>Zenaida leucoptera</i> .....		
1 Red-bellied Wallaby .....	<i>Halmaturus billardieri</i> .....		
1 Red-necked Wallaby.....	<i>Halmaturus thetidis</i> .....		
1 White-crested Tiger-Bittern	<i>Tigrisoma leucolophum</i> .....		
2 Australian Rails.....	<i>Rallus australis</i> .....		

Of these, the following species were stated to have been exhibited for the first time:—*Hoplocephalus superbus*, *Pseudechis porphyriaca*, *Sceloporus chlorolepidotis*, *Donacola castaneothorax*, *Anas superciliosa*, *Estrellda ruficauda*, *Dromæus irroratus*, *Cacatua triton*, *Pyrranga æstiva*, and *Tigrisoma leucolophum*.

The following list of additions made to the Menagerie by gift and purchase, during the month of June, was read:—

1 Boa Constrictor.....	<i>Boa constrictor</i> .....	Presented by	Capt. —
1 West Indian Turtle .....	<i>Chelonia midas</i> .....		Sparks Moline, Esq.
1 Monkey from the Mozambique.	<i>Cercopithecus rufo-viridis</i> ...		G. Billing, Esq.
2 Harlequin Beetles .....	<i>Acrocinus longimanus</i> .....		G. Bond, Esq.
2 Common Herons .....	<i>Ardea cinerea</i> .....		Donor unknown.
1 Jackal.....	<i>Canis</i> (from India) .....		E. Percy Thompson, Esq.
1 South American Boa.....	<i>Boa constrictor</i> .....		J. Fforde, Esq.
1 Irish Hare .....	<i>Lepus hibernicus</i> .....		R. J. Montgomery, Esq.
1 Spider Monkey .....	<i>Ateles pentadactylus</i> .....		Col. Charles Ford, R.E.
1 Ringed Parrakeet .....	<i>Palæornis torquata</i> .....		Richard Tress, Esq., F.Z.S.
2 Carolina Water Tortoises ..	<i>Emys</i> —? .....		A. Russell, Esq., M.P., F.Z.S.
1 Young Brown Bear .....	<i>Ursus arctos</i> .....		J. T. Hamilton, Esq.
2 Baboons .....	<i>Cynocephalus hamadryas</i> .....		Gordon Sandiman, Esq.
2 Weaver Birds.....	<i>Ploceus sanguinirostris</i> .....		
1 Little Bitterns .....	<i>Ardetta minuta</i> .....		
2 Passerine Owls .....	<i>Athene noctua</i> .....		
1 Red Kangaroo .....	<i>Macropus rufus</i> .....		
1 Emeu .....	<i>Dromæus nova hollandie</i> .....		
2 Kangaroo Rats .....	<i>Beltongia penicillata</i> ? .....		
4 Spotted Woodpeckers .....	<i>Picus major</i> .....		
6 Green Frogs .....	<i>Hyla arborea</i> .....		
2 Blue-mountain Lories .....	<i>Trichoglossus swainsoni</i> .....		
1 Macaque Monkey .....	<i>Macacus cynomolgus</i> .....		
1 Australian Water-hen .....	<i>Porphyrio melanotus</i> .....		
1 South Australian Lizard ..	<i>Monitor gouldi</i> .....		
1 Yellow-footed Rock Kangaroo.	<i>Petrogale xanthopus</i> .....	Purchased.	
2 Shieldrakes .....	<i>Tadorna vulpanser</i> .....		
4 Kentish Plovers.....	<i>Hiaticula cantiana</i> .....		
2 Leporines (hybrids) .....	{ <i>Lepus timidus</i> , ♂ .....		
	{ — <i>cuniculus</i> , ♀ .....		
2 Palm Squirrels .....	<i>Sciurus palmarum</i> .....		
6 Black Salamanders .....	<i>Salamandra nigra</i> .....		
1 Vulpine Phalanger.....	<i>Phalangista vulpina</i> .....		
2 Armadillos .....	<i>Dasypus encoubert</i> .....		
1 Indian Starling .....	<i>Acridotheres ginginianus</i> .....		
1 African Lizard .....	<i>Regenia ocellata</i> .....		
1 Blue Macaw .....	<i>Ara glauca</i> .....		
1 Military Macaw.....	<i>Ara militaris</i> .....		

Of these, *Cercopithecus rufo-viridis*, *Acridotheres ginginianus*, *Ara glauca*, *Monitor gouldi*, *Regenia ocellata*, and *Petrogale xanthopus* were stated to have been exhibited for the first time.

November 13th, 1860.

Dr. J. E. Gray, V.P., in the Chair.

Dr. Hamilton exhibited some hen Pheasants (*Phasianus colchicus*) which had partially adopted the male plumage, and pointed out that they were all affected with disease in the ovarium, and that those in which the disease had made greatest progress had advanced farthest towards the male in external appearance.

Mr. Gould called the attention of the meeting to a Kangaroo living in the Society's Gardens, generally believed to be *Macropus rufus*, but which he was inclined to consider distinct, and for which he proposed the temporary appellation of *Macropus (Osphranter) pictus*.

The Secretary read the following extracts from a letter addressed to him by the Rev. G. Beardsworth, of Selling, Kent, giving an account of two Cetaceans, mother and young (probably *Hyperoodon rostratus*), killed on the North Kentish coast, near Whitstable, October 29, 1860:—

“Dam: extreme length 26 feet; greatest girth nearly 20 feet; snout or beak 17 inches long by 7 wide; pectoral fins 29 inches long, dorsal one rather shorter. Tail set transversely, and very slightly bifurcated, in fact very nearly straight, 7 feet across. The blow-hole set transversely on the crown of the head, a single straight line, about 6 inches long, and slightly behind the eyes. Eyes of human shape, about twice the size, and furnished with eyelids. The pectoral fins set very low, so much so that a straight stick would touch the roots of both without bending. Not the slightest traces of baleen or of teeth. Tongue entirely detached beneath, and fringed with a kind of papillæ in a double row, about  $\frac{3}{4}$  of an inch deep. Forehead rising abruptly to the height of 13 inches from the snout, and very slight traces of any ridge between them. Two diverging grooves beneath the throat, about 18 inches long. The dorsal and pectoral fins divide the whole length into three portions, of which the two end ones are about equal, the middle one rather longer. Colour, a brownish-black; quite black on the back and tail, shading to a dirty white below and on the cheeks.”

“Young one about 14 feet long, differing only from the old one in being slighter and of a lighter colour.”

“One circumstance I think deserves recording. One of the coast-guardmen who killed these animals told me that the animal ‘sobbed’ very much, but that its only efforts were to smother itself by pushing its snout into the sand. May not this give some clue to the use of the beak? May it not be to procure food by suction from the sand? This might show some reason for the papillæ-like fringe to the tongue, which was alike in both specimens.”

“As showing the nature of the animal, it should also be stated that the cub could easily have escaped, and, in fact, went away three times, but each time returned from hearing the cries of her dam; on the last return, the water had become too low to permit its further escape.”

Mr. O. Salvin stated that he had lately received from Mr. Robert Owen, Corresponding Member of the Society, specimens of the eggs of twenty-three species of Guatemalan birds. Amongst these were two eggs of the Quezal, or Long-tailed Trogon (*Pharomacrus paradiseus*), which he exhibited, as he believed, for the first time. Mr. Owen's note relating to their capture was as follows:—“In an expedition to the mountains of Santa Cruz, one of our hunters told me that he knew of a Quezal's nest about a league from Chilasco, in the same range, and offered to procure me the eggs and one of the birds if I would send my servant with his gun to help him. This I accordingly did, and my man returned with two eggs and the hen bird, which he said that he shot as she left her nest. He described the nest as being placed in the main stem of a decayed forest tree, about 26 feet from the ground. The hollow or nest had but one entrance, not more than large enough to allow the bird to pass,—the interior cavity being of barely sufficient capacity to allow of the female bird turning round. Inside there were no signs of a nest, beyond a layer of small particles of decayed wood, upon which the eggs were deposited.

“The mountaineers all say that the Quezal avails itself of the deserted holes of the Woodpecker, probably founding their statement upon the unfitnes of the bird's beak for boring into the trunks of trees.”

The following papers were then read:—

1. NOTE ON THE FEMALE OF *CUSCUS ORNATUS*.  
By Dr. J. E. GRAY, F.R.S., V.P.Z.S., &c.

On the 11th of January of this year\* I described a new species of *Cuscus*, under the name of *Cuscus ornatus*, from a male specimen sent by Mr. Wallace from the Island of Batchian.

Mr. Wallace has now sent three female *Cusci* (two adults and one younger specimen) from Ternate, which appear to be the females of the species above-described.

The older female only differs from the male from Batchian in being darker. One specimen has many more spots on it than the other; the spots are small, irregular in size, and not disposed symmetrically. The younger specimen is yellower than the others, but, still, darker and browner than the male, and only indistinctly spotted. The dorsal streak is distinct and well-marked in the whole of the three, and disposed exactly as in the male.

\* See *anteà*, p. 1.



2. ON A NEW SPECIES OF KANGAROO, OF THE GENUS *HALMATURUS*. BY JOHN GOULD, F.R.S., &c.

*HALMATURUS* *STIGMATICUS*.

Face, sides of the body, outer side of the fore limbs, and the flanks rufous, more or less interspersed with whitish-tipped hairs; outer side of the hinder limbs rich rusty-red; occiput dark brown, interspersed with silvery-tipped hairs; ears externally clothed with long black hairs, and narrowly fringed on the front edge with white; upper surface of the body blackish-brown, interspersed with numerous whitish-tipped hairs, and gradually blending with the rufous hue of the flanks; down the back of the neck an indistinct line of a darker or blackish hue; across each haunch a broad and conspicuous mark of buff; upper lip, chin, and all the under surface of the body and the inner side of the limbs dirty white; hands and feet dark brown; upper surface of the tail dark brown; on its sides the hairs are less numerous, and the scaly character of the skin becomes conspicuous.

	ft.	in.
Length from the tip of the nose to the extremity of the tail . . . . .	3	4
— of the tail . . . . .	1	4
— of the tarsus and toes, including the nail . . . . .	0	5 $\frac{3}{4}$
— of the arm and hand, including the nails . . . . .	0	6 $\frac{1}{4}$
— of the face from the tip of the nose to the base of the ears . . . . .	0	4 $\frac{3}{4}$
— of the ear . . . . .	0	1 $\frac{1}{5}$

*Hab.* Point Cooper, on the north-eastern coast of Australia.

*Remark.*—Nearly allied to *H. thetidis*, but differing from that species in being of a somewhat larger size, in the more rufous colouring of the fur, particularly of that clothing the hind limbs, and in having a broad brand-like mark of buff on each haunch.

For the discovery of this new species we are indebted to the researches of Mr. John Macgillivray. The typical specimen is now in the British Museum.

3. NOTE ON THE JAPANESE DEER LIVING IN THE SOCIETY'S MENAGERIE. BY PHILIP LUTLEY SCLATER, M.A., SECRETARY TO THE SOCIETY.

I venture to call particular attention to one out of several important additions made to the Menagerie since the last meeting for scientific business.

A pair of a very beautiful small species of Deer, quite new to the collection, were presented to the Society in July last by J. Wilks, Esq. They were obtained at Kanegawa, in Japan, and brought to this country by Captain D. Rees, of the ship 'Sir F. Williams.'

Dr. Gray has described these animals, believing them to be new, in a recent number of the 'Annals of Natural History,' as *Rusa javanica* (Ann. N. H. ser. iii. vol. vi. p. 218, Sept. 1860). But on reference to the figure of *Cervus pseudaxis* of MM. Eydoux and Souleyet in the 'Zoology of the Voyage of the Bonite' (Atlas, pl. 3. Zool. p. 64), and to the further details concerning the same animal given by Dr. Pucheran in the 'Archives du Muséum d'Hist. Nat.' (vi. pp. 416, 489), it seems probable that our new acquisition may belong to the same species. The locality of the example figured in the 'Voyage of the Bonite' was not ascertained; but a second specimen, brought home by the expedition of the 'Astrolabe and Zelée,' was said to have come from the Sooloo Islands. This discrepancy of localities is a fact which would lead me to believe that our animals are different from *Cervus pseudaxis*; but in the structure of the horns, in the general colouring of the body, in the elongation of the hairs of the mane and throat, and in the disappearance of the white spots in winter, our specimens seem to me to agree well with the peculiarities indicated by the French authorities; and the male possesses partially developed canines, which are likewise spoken of in the case of *Cervus pseudaxis*.

Mr. Blyth has also recently described a Deer from the island of Formosa, under the name *Cervus taiouanus* (Journ. As. Soc. Beng. xxx. p. 90), which is probably likewise referable to this same species. At the time of writing this description, Mr. Blyth was inclined to consider the Formosan animal different from a pair of the small Deer of Japan, which he had living with him in Calcutta at the same date. This opinion, however, he has subsequently modified, stating, in a letter, addressed to me, dated July 4th of the present year, with reference to the Formosan and Japanese Deer, which he had then turned out together in his garden at Calcutta, that he was "satisfied that they were of one and the same species."

My opinion therefore is—though I do not state it without hesitation, against so high an authority on the subject of the *Cervidæ* as Dr. Gray—that *Rusa javanica* is probably a synonym of *Cervus pseudaxis*, Eydoux and Souleyet, and *Cervus taiouanus*, Blyth. But there is, perhaps, a still older appellation for this little Deer. The figure of Temminck and Siebold's *Cervus sika*, in the 'Fauna Japonica,' certainly looks very little like the male of this species. The uniform colouring and the third branch to the horns are very noticeable points in which it differs from our male Deer. To the description given in the same work I have unfortunately had no access, the sheets containing it being deficient in the only copy I have been able to consult. But Mr. Bartlett, who has lately returned from Holland, informs me that a female Deer living in the Gardens at Amsterdam, and there considered as *Cervus sika*, is undoubtedly the same as ours; and as the Dutch naturalists have consulted the type in the Leyden Museum, there appears to be little doubt of the fact. I am therefore induced to believe that the following may prove to be the correct synonymy of this species of Deer:—

## CERVUS SIKA.

*Cervus sika*, Temm. & Sieb. Fauna Japonica, Mamm. pl. . (fig mala).

*Cervus pseudaxis*, Eyd. & Soul. Voy. Bonite, Zool. p. 64. pl. 3. Buch. Arch. Mus. Par. vi. pp. 416, 489; Wagn. Suppl. Schreber's Säug. v. p. 364 (?).

*Cervus axis*, ex China, Cantor, Ann. N. H. ix. p. 274.

*Cervus taiouanus*, Blyth, J. A. S. B. xxix. p. 90.

*Rusa javanica*, J. E. Gray, Ann. N. H. ser. 3. vi. p. 218.

Mr. Blyth, it may be remarked, is of opinion (J. A. S. B. xxix. p. 90) that this Deer "belongs strictly to the *Elaphine*, and not to the *Arvine* group," and states that its skull "has the same large round infra-orbital foramina as *C. elaphus*, and its immediate congeners.

#### 4. ON THE AFFINITIES OF BALÆNICEPS. BY PROFESSOR J. REINHARDT, FOR. M. Z.S.

The majority of ornithologists seem to look upon the *Balæniceps* as approaching nearest to *Cancroma*, and to consider it the African representative of this South American type. Now it shall be freely conceded that it indeed appears more nearly allied to the Boatbill than to the Pelicans, to which Mr. Gould was inclined to refer this, perhaps the most extraordinary of the numerous highly interesting new forms introduced by him in ornithology. The *Balæniceps* seems, further, better placed in the neighbourhood of the *Cancroma* than between the Spoonbills and the Flamingos, as proposed by M. Des Murs,—a position admissible, I think, only when the texture of the egg is made the ruling principle of classification. But it may be questionable whether the large Storks (*Leptoptilos*) do not make a nearer approach to it than the Boatbill; and I do not hesitate to advance, that at all events this last-mentioned bird is not its next of kin.

When several years ago I became first acquainted with the description and the admirable figures of the bird in question in the 'Proceedings' of the Zoological Society of London, I was struck with some features in the gigantic new form, recalling to my mind another curious bird, and I wondered why it had not been compared with this as well as with the Pelicans, Cranes, Herons, and the Boatbill; but having no opportunity to examine the *Balæniceps* itself, I could not arrive at any settled opinion.

The Museum at Copenhagen having last year obtained a female specimen of this rare bird from the Imperial Museum at Vienna through the generous interference of Prof. Steenstrup, I have at length been able to substantiate, through immediate comparison, that (indeed as I presumed) the equally African *Scopus* is the nearest relation of the *Balæniceps*. I may be permitted shortly to state my reasons for this *rapprochement*.

The *Cancroma* does not, in my opinion, represent a peculiar sub-

family ; it is in every respect a Night Heron gifted with a very singular beak. The plumage, the feet and their serrated middle claws, and further the colour, manifest the affinity. Even in the bill, anomalous as at first sight it may appear, a minute examination will enable us to recognise the beak of a stout-billed Night Heron (*A. violacea*, for instance), strongly modified, it is true, in shape, but still exhibiting many of the essential characters. To the beak of the *Balæniceps*, on the contrary, it seems to afford only an analogy (and not even a very strong one), but no true affinity. Its flattened form, and the slender and pliable branches of the lower jaw, prove, in my opinion, that the beak of the Boatbill is calculated to be rather a very capacious than a very strong one ; whilst the bill of the *Balæniceps*, being higher than broad, evinces an extraordinary strength in almost every feature, but especially in the powerful hook, in which the culmen terminates. In the Boatbill there is no such hook, but the upper mandible is provided with the usual notched tip of the Night Herons, not separated from the sides of the bill by a well-marked groove, as is the hook of its presumed kindred ; and if we carry on the comparison further, we shall find that the lower jaw does not offer the truncated apex, characterizing this part in the *Balæniceps*, and being indeed the consequence of the shape of the hook. The different form of the nostrils and the different size and extent of the nasal groove afford other notable points of diversity between the two birds ; and though the skin of the throat may be dilatible in a certain degree in the living *Balæniceps*, I should not think that this bird possesses a true pouch like that of the *Cancroma*. At all events the fact of the mentum being very thick-feathered throughout two-thirds of its length induces me to doubt it ; and the stout and apparently little pliable under-jaw seems also to make it not very probable.

It must be conceded, that the *Balæniceps* approaches much to the *Cancroma* in the general structure of the feet ; but it has not, like this bird, a pectinated middle claw ; and this circumstance affords, in my opinion, a strong warning not to class it with the Boatbill, as this peculiar serrature never fails in any member of the Heron tribe.

As to what relates to the nature of the plumage, the *Balæniceps* differs also in not unimportant points from the *Cancroma*, the downy part of each feather being proportionally larger, and genuine down being intermixed in considerable quantity among the feathers, as in *Leptoptilos*, while in the *Cancroma* and the Herons there is hardly any down at all amongst them : moreover the hyporhachis is well developed in the last, but very small in the *Balæniceps*, which also in this point seems to adhere to the Storks, in certain species of which it is even entirely wanting. The distribution of the feathers on the body (the pterylose) cannot be accurately studied on a stuffed skin ; therefore I am not able to give any sufficient account of it in the *Balæniceps* ; but even now I think I may say, that the pterylose of this bird, when minutely examined, will probably show notable differences from that of the Boatbill. It especially appears that the neck is feathered nearly all over, while in the Boatbill and the whole Heron-tribe there are large *apteria* on this part. A point of

some consequence to be cleared up, but about which I can say nothing myself, is whether the *Balæniceps* is gifted or not with those curious limited spots, clothed only with a peculiar sort of down (the "Puder-dunenfluren" of Nitzsch), which characterize the *Cancroma* as well as the Herons, but are wanting in the *Scopus* and the Storks.

If, on the other hand, we now compare the beak of the *Balæniceps* with that of the *Scopus*, we shall find a very remarkable accordance in nearly all material points. In both of them the nostrils are shaped exactly in the same way, being narrow, just perceptible slits. In *Scopus* as well as in *Balæniceps* the culmen is separated throughout its whole length from the sides of the bill by a deep narrow groove or furrow, and terminates in a powerful hook, though it is conceded that the hooked tip is proportionally not quite so large in the former. The very sharp *carina* into which the culmen is compressed in the *Scopus*, is indicated by a ridge along the broad culmen of the *Balæniceps*; the apex of the lower jaw is truncated in the same way in both birds; and notwithstanding the nearly perpendicular position of the sides of the bill in the *Scopus*, the tomia are convex and bend inwards, as in the *Balæniceps*. In a word, the minute detail of the bills of these two remarkable birds is, as far as I can see, very much the same; and, indeed, if we fancy the beak of the *Balæniceps* so much compressed that the ridge along the culmen becomes converted into a sharp cutting edge, and the branches of the lower maxilla touch each other in the anterior half of their length, it will assume most exactly the shape of that of a gigantic, but somewhat short-billed *Scopus*.

With regard to the feet, it is true that the toes are connected by a short interdigital membrane in the *Scopus*, while there is no vestige of it in the *Balæniceps*. The importance of this difference may perhaps be differently appreciated by zoologists, but I need not enter into a discussion as to its value; for, should the disappearance of the interdigital membrane be considered a serious obstacle against classing this bird with the *Scopus*, it must likewise divorce it from *Cancroma*, where such a membrane also exists, being only somewhat smaller than in the *Scopus*. For the rest, there is no material difference in the structure of the feet of the two birds, the hind-toe even in the *Scopus* being inserted at the level of the other toes. It must, however, be confessed, that in this oft-mentioned bird also the middle nail is pectinated, though indeed not quite so regularly as in the Boatbill. This is certainly a remarkable deviation from the *Balæniceps*; but it is obvious that this fact, at all events, cannot be adduced as an argument in favour of a nearer relationship to the *Cancroma*.

In the ptilose of the *Scopus* seem to prevail nearly the same peculiarities which have been mentioned as distinguishing the plumage of the *Balæniceps* from that of the Boatbill; and even in this respect it certainly proves a nearer relation than the last-mentioned American bird. With regard to the pterylose, the *Scopus* is known in a certain point to deviate from, I believe, all the other waders, the feathers on the neck being arranged in a manner quite peculiar; should, therefore, the neck of the *Balæniceps* really prove to be feathered all

round, there will so far be a difference: but it must be remembered that a neck feathered throughout might possibly approximate the *Balæniceps* to the Storks, but never to the Boatbill.

I believe that a minute consideration of the external characters of the *Balæniceps* will sufficiently enable us to recognise in this gigantic wader a near relative of *Scopus*; but, no doubt, new and important proofs are to be derived from the skeleton when compared with that of the last-mentioned bird. I have, however, not the means of making such a comparison, never having seen any part of the skeleton of the *Balæniceps*. Even of the skeletons of the *Scopus* and the *Cancroma* I have only more or less imperfect skulls and some few bones at hand. I should, therefore, only wish to mention here, that the interorbital septum is entire in the *Scopus* (as it is in *Leptoptilos* and *Tantalus*), but perforated (as far as I can see, in the mutilated skull now before me) by a large opening in the *Cancroma* as well as in the Herons; and that the zygomatic arch, formed by the malar bones, is longer in the Boatbill than in the *Scopus*,—so much so indeed, that in the shorter skull of the first it is nearly twice as long as it is in the longer skull of the *Scopus*—this bird approaching even in this respect to the Storks, while the Heron type prevails in the *Cancroma* even in this point. It would be very interesting to know how the *Balæniceps* is shaped in these respects\*.

And now, to put an end to my cursory remarks, I shall beg only to advance, as the final conclusion to which I have been led by my examination of the *Balæniceps*, that this most curious bird should be removed from the neighbourhood of the *Cancroma*, to constitute, together with the *Scopus*, a small, exclusively African subfamily in the great circle of the *Ardeidae* of Leach, approaching nearer to the Storks than to the Herons.

##### 5. DESCRIPTION OF A NEW SPECIES OF HORNBILL FROM WESTERN AFRICA. BY JOHN GOULD, F.R.S., ETC.

###### TOCCUS HARTLAUBI, Gould.

All the upper surface, back, wings, and tail uniform dark brownish-black, glossed with green; three outer tail-feathers on each side tipped with white, the inner one of the three less so than the others; under surface sooty-black, each feather fringed with grey, giving these parts, particularly the abdomen, a mottled appearance; under surface of the shoulder greyish-white; basal portion of the inner webs of the primaries silvery-grey; bill rather stout and deep at the base, with a small sharp keel or ridge near the base of the culmen; basal three-fourths of the bill black, apical fourth obscure blood-red.

Total length, 14 inches; bill,  $2\frac{1}{2}$ ; wing, 6; tail,  $6\frac{3}{4}$ ; tarsi, 1.

At first sight, the specimen from which the above description was

\* My friend Mr. A. Newton, to whom I had communicated my opinion in regard to the *Balæniceps* during his visit to Copenhagen last year, has lately informed me that the malar bones are enormously large and strong in this bird; the same cannot be said of them in *Scopus*.

taken, and which is the only one I have seen, would appear to be immature; but when the tail-feathers are closely examined, they will be found to comprise both old and new feathers of precisely the same character, proving that such cannot be the case. In the size of its body this new Hornbill does not exceed the common Black-bird (*Merula vulgaris*); it must therefore be regarded as one of the smallest members of its group.

I have named this bird *hartlaubi*, in honour of my friend Dr. Hartlaub of Bremen, a gentleman who has paid great attention to general ornithology, but especially to that of Western Africa, where this bird is believed to have been procured, but from what precise locality is unknown.

6. DESCRIPTION OF A NEW SPECIES OF THE GENUS MOHO, OF LESSON. BY JOHN GOULD, F.R.S., ETC.

MOHO APICALIS, Gould.

Opposite page 357 of Dixon's 'Voyage round the World,' published as long back as 1798, will be found the figure of a bird under the name of the "Yellow Tufted Bee-eater," which appears never to have received a specific appellation: this has probably arisen from the circumstance of no examples having yet found their way into our museums. The description given by Captain Dixon, copied from Latham's 'Synopsis,' doubtless has reference to the bird which my late friend M. Temminck called *Moho fasciculatus*.

Two examples of this curious bird, male and female, which will hereafter be deposited in the National Collection, having lately come into my possession, I avail myself of the opportunity of characterizing the species, and have assigned to it the name of *apicalis*, from the circumstance of all but the two middle tail-feathers being tipped with white; in which respect Capt. Dixon remarked that the bird he had figured differed from Latham's description of the Yellow-tufted Bee-eater.

Dixon's bird was obtained at Owhyhee, and I believe that my two specimens were brought from the same island.

This bird may be described as having the general plumage sooty-black; tail brown, all but the two middle feathers largely tipped with white; the two central feathers somewhat narrower than the others, and gradually diminishing in the apical third of their length into fine hair-like or filamentous upturned points; axillæ or under surface of the shoulder white; flanks and under tail-coverts bright yellow; bill and legs black.

Total length, 12 inches; bill,  $1\frac{1}{2}$ ; wing,  $4\frac{3}{4}$ ; tail,  $6\frac{3}{4}$ ; tarsi,  $1\frac{1}{2}$ .

The plumage of the female is in every respect similar to that of the male; but, as in the Honeyeaters of Australia generally, particularly amongst the members of the genus *Ptilotis*, the body is fully a fourth less in size.

## 7. DESCRIPTION OF A NEW ODONTOPHORUS.

BY JOHN GOULD, F.R.S., ETC.

## ODONTOPHORUS MELANONOTUS, Gould.

Throat, fore part of the neck, and chest rich chestnut-brown ; abdomen deep blackish-brown, very finely but obscurely freckled with chestnut ; lower part of the abdomen, thighs, under tail-coverts, tail, back of the neck, wings, and rump uniform velvety brownish-black ; legs apparently horn-colour in front, with a wash of orange between the scales ; bill black.

Total length, 10 inches ; bill,  $\frac{7}{8}$  ; wing, 6 ; tail,  $2\frac{1}{2}$  ; tarsi,  $2\frac{1}{8}$ .

*Hab.* Ecuador.

There do not appear to be any markings about the face, as is usual with the other members of this genus ; but as my specimen is somewhat injured in that part, I am unable to speak positively on this point : the orange colouring, too, between the scales of the legs may or may not be natural ; it is probably due to some extraneous cause.

This new species, which I have received direct from Ecuador, is in every respect a typical *Odontophorus*, and is very nearly allied to *O. nigrogularis*, *O. erythrops*, and *O. hyperythrus* ; but when the four species are seen together, their specific distinctness is very readily apparent.

When shall we acquire a knowledge of the whole of this group of birds ?

## 8. CATALOGUE OF THE BIRDS OF THE FALKLAND ISLANDS. BY PHILIP LUTLEY SCLATER, M.A., SECRETARY TO THE SOCIETY.

(Aves, Pl. CLXXIII.)

Mr. Leadbeater having kindly invited me to examine a very fine series of skins collected in the Falkland Islands by Capt. Pack—a gentleman who has been for several years resident there—I have embraced the opportunity of drawing up a more complete list of the birds of the Falklands than any that has hitherto appeared, chiefly with the hope of inducing Capt. Abbott, Capt. Pack, and other gentlemen who have turned their attention to the ornithology of these islands, to continue their researches, by showing them that we endeavour at home to make some use of the “raw material” with which they provide us.

The Falkland Islands were visited by many of the earlier navigators ; and several species of birds belonging to its fauna, discovered by them, either on the islands themselves, or on the neighbouring coast of South America, are included in the Systems of Linneus, Gmelin, and Latham. The French Exploring Expedition of the ‘*Uranie*,’ which was wrecked on these islands in 1819, collected many specimens of birds there, and MM. Quoy and Gaimard, who wrote the ‘*Zoology*’ of the voyage, described several new species which were the results of their investigations. But it is to Mr. Darwin, who





July 1871

M. & N. Hanhart imp.

CHLOEPHAGA RUBIDICEPS



passed some time in the Falklands, when Naturalist on board H.M.S. Beagle, that we are indebted for the first detailed account of the birds of this group. In the second volume of the 'Zoology' of the Voyage of the Beagle, which is devoted to Ornithology, upwards of 20 species are recorded as having been obtained in the Falklands on this occasion, and many very interesting details are given of their habits and localities. Many specimens of birds were also collected at the Falkland Islands by the officers of H.M. Ships Erebus and Terror during the Antarctic Expedition; and though the 'Zoology' of that voyage has, unfortunately, never been completed, the localities of many of the specimens have been recorded in the Lists of the British Museum, in which they were deposited.

In the First Part of our 'Proceedings' for the past year\*, Mr. Gould has described the eggs of some of the birds of the Falklands, "from specimens collected principally by Captain C. C. Abbott." Mr. Gould's list notices 38 species as occurring in the group. Reference to some other authorities, together with Capt. Pack's series, has enabled me to raise the number of birds now well ascertained to be met with in these islands to 57.

It may be remarked that the fauna of the Falklands is purely South American in character, the whole of these 57 species, with four or five exceptions only (*Milvago australis*, *Phrygilus melanoderus*, *P. xanthogrammus*, *Cinclodes antarcticus*, and *Muscisaxicola macloviana*), as far as is hitherto known, being also found on the neighbouring mainland, and these excepted species belonging to South American genera. Out of the 57 species, 16 only are what are generally termed Land-birds (*Accipitres* and *Passeres*), the remainder being *Grallæ* and *Anseres*.

### I. ACCIPITRES.

1. CATHARTES AURA (Linn.): Darwin, Zool. Voy. Beagle, p. 8; Gould, P. Z. S. 1859, p. 93.

"Tolerably common" (Darwin). Specimens sent by Capt. Pack and Capt. Abbott. The egg figured in 'The Ibis,' vol. ii. pl. 1. fig. 2, as that of a rare variety of *Milvago australis*, belongs to this bird (see Capt. Abbott in 'Ibis,' 1860, p. 432), so that it breeds in the Falklands. Mr. Gurney informs me that the skins sent by Capt. Abbott are not, in his opinion, different from North American specimens.

2. MILVAGO AUSTRALIS (Gm.).—*Falco leucurus*, Forster, MS.—*Milvago leucurus*, Darw. Zool. p. 15; Gould, P. Z. S. 1859, p. 93; Selater, Ibis, 1860, p. 24 (cum fig. ovi).

"Exceedingly numerous, and very bold and rapacious" (Darwin). Specimens sent by Capt. Pack. The egg of this bird is figured in 'The Ibis,' as above referred to, from examples transmitted by Capt. Abbott.

\* Proc. Zool. Soc. 1859, p. 93.

3\*. BUTEO ERYTHRONOTUS (King).—*Haliaëtus erythronotus*, King, Zool. Journ. iii. 424.—*B. tricolor*, Lafr. et d'Orb.; Darw. Zool. p. 26; Gould, P. Z. S. 1859, p. 93; Selater, Ibis, 1860, p. 25 (cum fig. ovi).

“Preys chiefly on rabbits” (Darwin). Specimens sent by Capt. Pack and Capt. Abbott, and eggs also by the latter, as described by Mr. Gould, and figured in ‘The Ibis.’ There is an extraordinary degree of variation in the plumage of this bird, and its phases of change are not yet well understood.

4. BUTEO VARIUS, Gould, P. Z. S. 1837, p. 10; Cassin, Rep. U. S. Expl. Exp. viii. p. 92. pl. 3. f. 1; Gould, P. Z. S. 1859, p. 94.

Examples transmitted by Capt. Abbott, as also of the egg, as described by Mr. Gould. Mr. Gurney, who has placed some of these specimens in the Norwich Museum, considers this to be a good species.

5. CIRCUS CINEREUS, Vieill. Nouv. Dict. iv. 454; Darw. Zool. p. 30.—*Falco histrionicus*, Q. et G. Voy. Uranie, p. 95.

“Very tame, and preys on small quadrupeds, molluscous animals, and even insects (Darwin).” Specimens transmitted by Capt. Pack.

6. OTUS BRACHYOTUS (Gm.).—*Otus palustris*, Darwin, Voy. p. 33; Gould, P. Z. S. 1859, p. 94.

“Amongst low bushes” (Darwin).

## II. PASSERES.

### Fam. TURDIDÆ.

7. TURDUS FALKLANDICUS, Quoy et Gaim. Voy. Uranie, p. 104; Darwin, Zool. p. 59.—*Turdus magellanicus*, King: Gould, P. Z. S. 1859, p. 94.

Falkland Islands (*Abbott and Pack*).

Eggs described by Mr. Gould, *l. c.* The skins from the Falkland Islands seem to me to be rather larger and more rufescent below than those which I have examined from the mainland.

### Fam. TROGLODYTIDÆ.

8. CISTOTHORUS PLATENSIS (Gm.): Pl. Enl. 432: *Sylvia platensis*, Gm. et Lath.; Darwin, Voy. p. 75.

Not uncommon, living close to the ground in the coarse grass (*Darwin*).

Falklands (*Pack*).

### Fam. MOTACILLIDÆ.

9. ANTHUS CORRENDERA, Vieill. Nouv. Dict. xxvi. p. 491; Enc.

\* 3. BUTEO POLIOSOMA (Q. et G.).—*Falco poliosoma*, Q. et G. Voy. Uranie, p. 92. pl. 14.

Falkland Islands (*Q. et G.*). A distinct species, unless it be referable to one of the stages of *B. erythronotus* or *B. varius*.

Méth. p. 325; d'Orb. Voy. Ois. p. 225; Darw. Zool. p. 85; Gould, P. Z. S. 1859, p. 95.

"Very common," and "resembles a true *Alauda* in most of its habits" (*Darwin*).

Falklands (*Pack*). Egg described by Mr. Gould.

#### Fam. STURNIDÆ.

10. STURNELLA MILITARIS (Gm.), Pl. Enl. 113: *Sturnus militaris*, Gm.; Darw. Zool. p. 110; Gould, P. Z. S. 1859, p. 94.

Falklands (*Pack*). Nest and eggs sent by Capt. Abbott and described by Mr. Gould.

#### Fam. FRINGILLIDÆ.

11. PHRYGILUS MELANODERUS (Quoy et Gaim.).—*Emberiza melanodera*, Q. et G. Voy. Uranie, Zool. i. p. 109. — *Chlorospiza melanodera*, G. R. Gray, in Darw. Zool. Beagle, p. 95. pl. 32.—*Melanodera typica*, Bp. Consp. p. 470; Gould, P. Z. S. 1859, p. 95.

Falkland Islands, "abundant in large scattered flocks" (*Darw.*); Capt. Pack has sent examples of both sexes. Nest and eggs, forwarded by Capt. Abbott, are described by Mr. Gould.

12. PHRYGILUS XANTHOGRAMMUS (G. R. Gray).—*Chlorospiza xanthogramma*, G. R. Gray, in Darw. Voy. p. 96. pl. 33.

Falkland Islands (*Darwin*). Distinguished from the preceding by the yellow superciliaries and white markings of the tail-feathers. More examples are wanted to confirm this species.

#### Fam. DENDROCOLAPTIDÆ.

13. CINCLODES VULGARIS (Lafr. et d'Orb.): Voy. Am. MÉR. Ois. pl. 57. f. 1; Bp. Consp. p. 214.—*Opetiorhynchus vulgaris*, Darw. Voy. Zool. p. 66.

Common in the Falkland Islands (*Darwin*).

14. CINCLODES ANTARCTICUS (Garn.); Bp. Consp. p. 214.—*Furnarius fuliginosus*, Less.—*Opetiorhynchus antarcticus*, Darwin, Voy. Zool. p. 67.

Falkland Islands (*Darwin and Pack*).

Probably peculiar to the Falklands, being replaced on the continent by *C. patachonicus*.

#### Fam. PTEROPTOCHIDÆ.

15. SCYTALOPUS MAGELLANICUS (Lath.).—*Sylvia magellanica*, Lath.—*Scytalopus fuscus*, Gould; Jard. and Selb. Ill. Orn. n. s. pl. 19. Falkland Islands (*Darwin*).

#### Fam. TYRANNIDÆ.

16. MUSCISAXICOLA MACLOVIANA (Garn.); Bp. Consp. p. 197; Darwin, Voy. Zool. p. 83.

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Falkland Islands (*Lesson and Darwin*). Peculiar to the Falklands, if distinct from the continental *M. mentalis*.

### III. GRALLÆ.

#### Fam. CHIONIDIDÆ.

17. CHIONIS ALBA, Forst. ; Lath. G. H. ix. pl. 161 ; Darwin, Zool. p. 118 ; Q. et G. Voy. Uranie, p. 131. pl. 30.

Berkeley Sound, E. F. (*Ant. Exp.*) ; Falkland Islands (*Q. et G.*).

M. de Blainville has given an elaborate account of the osteology and anatomy of this bird in the 'Zoology' of the Voyage of the Bonite (p. 107 *et seq.*). Its nearest ally appears to be *Hæmatopus*.

#### Fam. CHARADRIIDÆ.

18. EUDROMIAS URVILLII (Garn.).—*Tringa urvillii*, Garnot.—*Vanellus cinctus*, Less.—*Charadrius rubecola*, Vig.—*Squatarola cincta*, Jard. and Selb. Ill. Orn. pl. 110 ; Darwin, Zool. p. 126 ; Gould, P. Z. S. 1860, p. 95.

Falkland Islands, frequenting the upland marshes (*Darwin*) ; Falklands (*Pack*) ; Berkeley Sound (*Ant. Exp.*).

The female is like the male, but with less rufous on the breast. Called 'Dottrel.' The eggs transmitted by Capt. Abbott are described by Mr. Gould, *l. c.*

19. ÆGIALITES FALKLANDICUS (Lath.).—*Charadrius falklandicus*, Lath. Ind. Orn. ii. 747.—*Hiaticula falklandica*, G. R. Gray, List of Spec. iii. p. 71.—*Charadrius annuligerus*, Wagl.

*Mus. Brit.*, ex ins. Falkland.

St. Louis, East Falkland, and Uranie Bay (*Ant. Exp.*). Specimens sent by Capt. Pack.

20. HÆMATOPUS LEUCOPUS, Garnot.—*H. luctuosus*, Cuv.

East Falkland (*Pack*). Egg in Mr. O. Salvin's collection, from Capt. Abbott.

21. HÆMATOPUS ATER, Vieill. Gal. Ois. ii. pl. 230 (part.).—*H. niger*, Q. et G. Voy. Uranie, p. 129. pl. 34, et Cuv. (part.), nec Pallas.—*H. ater*, Cassin, Report B. N. America, p. 200.—*H. townsendii*, Aud.—*H. unicolor*, Gould, P. Z. S. 1859, p. 96.

Falklands (*Abbott and Pack*). Egg described by Mr. Gould.

There appear to be several nearly allied species of Black Oyster-catchers inhabiting different regions:—

1. *H. niger*, Pallas (*H. bachmanni*, Aud.), Rep. B. N. Am. p. 700 : from the north-western coast of America and Kurile Islands.

2. *H. ater*, Vieill. (as identified by Mr. Cassin) : from Southern America and Falklands.

3. *H. fuliginosus*, Gould, B. Austr. vi. pl. 8 : from Australia.

4. *H. unicolor*, Forster ; G. R. Gray, Voy. Erebus and Terror, p. 12. pl. 10 : from New Zealand. Perhaps hardly different from the Australian bird.

5. *H. niger*, G. R. Gray, Gen. B. pl. 146 (nec Pallas) : from the Cape.

Fam. SCOLOPACIDÆ.

22. LIMOSA HUDSONICA (Lath.).—*Scolopax hudsonica*, Lath. Ind. Orn. ii. 720 ; Darw. Voy. Zool. p. 129. Falkland Islands (*Darwin and Pack*).

23. NUMENIUS BREVIROSTRIS, Licht. Verz. d. Doubl. p. 75. Falklands (*Pack*).

24. GALLINAGO MAGELLANICUS (King).—*Scolopax magellanica*, King, Zool. Journ. iv. p. 93 ; Darw. Zool. p. 131. Falkland Islands (*Darwin and Pack*) ; Berkeley Sound, E. F. (*Ant. Exp.*).

25. TRINGA BONAPARTII, Schlegel, Rep. N. Am. Birds, p. 722. —*Tringa schinzii*, Bp. Falklands (*Pack*).

Fam. ARDEIDÆ.

26. NYCTICORAX GARDENI (Jard.).—*N. americana*, Bp. ; Gould, P. Z. S. 1859, p. 96. Berkeley Sound, E. F. (*Ant. Exp.*) ; Falklands (*Pack*).

IV. ANSERES.

Fam. ANATIDÆ.

27. CHLOËPHAGA MAGELLANICA (Gm.).—*Anas magellanica*, Gm. ex Pl. Enl. 1006 ; Eyton, Mon. Anat. p. 32.—*Anas picta*, Gm. et Forst.—*Bernicla magellanica*, Gay, Fauna Chilena, et Cassin in Gilliss's Exp. ii. p. 201. pl. 24 (♂ et ♀) ; Darwin, Voy. Zool. iii. p. 134 ; Sclater, P. Z. S. 1857, p. 128, et 1858, p. 289. Falkland Islands (*Darwin, Gov. Moore, Pack*).

The "Upland Goose" was first received by this Society from the Falkland Islands in 1857, through the liberality of H. E. Captain Moore, R.N., then the Governor. Other examples have since been obtained, and we now possess three males and five females of this beautiful species. One of the females laid this spring, but did not succeed in hatching her eggs.

28. CHLOËPHAGA RUBIDICEPS, sp. nov. (Pl. CLXXIII.)—*B. inornata*, G. R. Gray, Zool. Voy. Erebus and Terror, Birds, pl. 24, and Sclater, Guide to Gardens of the Zoological Society, ed. 5 & 6, p. 16 : nec King.

*Ochracescenti-rubida, dorso superiore, collo undique cum pectore*

*et ventris lateribus lineis nigris transversim fasciatis : uropygio cum cauda æneo-nigricante : alis albis, primariis obscure fusco-nigris, tectricibus majoribus et scapularibus cinerascens-fuscis, illarum pogonii externis extus late æneo-viridibus : rostro nigro, pedibus nigris, extus sordide aurantiacis.*

Long. tota 17·0, alæ 13, caudæ 4·75, tarsi 2·4, rostri a rictu 1·3.

*Hab.* In ins. Falklandicis (*Pack*).

*Mus.* Brit., ex expeditione Antarctica.

This Goose, of which the Society now possesses living specimens of both sexes, is most nearly allied to the Ashy-headed Goose (*Chloëphaga poliocephala*), which has likewise been called *Bernicla inornata* by Mr. G. R. Gray, and is figured under that name in his 'Genera of Birds,' pl. 165. As in the Ashy-headed Goose, the male and female of the Ruddy-headed Goose (as I propose to term this bird) are coloured alike. The bird described as "*Anas inornatus*, mas," by Capt. King (Proc. Comm. Zool. Soc. i. p. 15), which is now in the British Museum, is decidedly different, in my opinion, from both *Chloëphaga poliocephala* and *C. rubidiceps*, most nearly resembling the male of *C. magellanica*, but being much smaller. The bird described as "*Anas inornatus*, fœm.," by Capt. King, is probably *C. poliocephala*. Specimens of this latter bird in the British Museum are from the island of Chiloe, and it appears to be the western representative of the present species.

*Chloëphaga rubidiceps* may be easily distinguished from *C. poliocephala* by the following characters:—The whole head and neck, which are ash-coloured in the latter, are, in the former, of a uniform buffy rufous: the transverse lineations on the body are much coarser and more numerous in *C. rubidiceps*, and the ground-colour is pale ochraceous rufous instead of deep chestnut. In *C. poliocephala* the belly is pure white, in *C. rubidiceps* it is deep rufous, and the sides of the belly are barred with pale rufous and black instead of white and black. The wings are coloured alike in the two species, and the rump and tail in both is of a uniform black, with dull greenish reflections. The under tail-coverts in both are reddish-brown, rather darker in *C. rubidiceps*. In both species the bill is black, and the legs black, with the outside of the tarsus and outer edge of the toes orange, giving them a singular parti-coloured appearance in the living bird. The size, dimensions, and general characters are, as nearly as possible, the same in both species.

29. BERNICLA ANTARCTICA (Gm.).—*Anas antarctica*, Gm.; Darwin, Zool. Beagle, iii. p. 134; Cassin in Gilliss's Exp. ii. p. 200. pl. 23 (♂ et ♀).

Falkland Islands (*Darwin, Ant. Exp., Pack*).

30. CYGNUS NIGRICOLLIS (Gm.).—*Anas nigricollis*, Gm.  
Falkland Islands (*Pack*).

31. CYGNUS COSCOROBA (Mol.).—*Anas coscoroba*, Mol.—*Cygnus anatoides*, King.

Falkland Islands (*Pack*).



32. *MARECA CHILOENSIS* (King).—*Anas chilensis*, King, P.Z.S. 1831, p. 15; Eyton, Mon. Anat. pl. 21.  
Falkland Islands (*Ant. Exp.*).

33. *DAFILA UROPHASIANUS* (Vig.).—*Anas urophasianus*, Vig. Zool. Journ. iv. 357; Eyton, Mon. Anat. pl. 20 (?).

A pair of Pintails in Capt. Pack's collection are *possibly* of this species in winter dress; but they do not agree with the figure of Mr. Eyton, being nearly white below, and having the sides of the head *under* the eyes closely freckled.

34. *PÆCILONETTA BAHAMENSIS* (Linn.).

One example, sent by Capt. Pack; but the bird is said to be rarely met with in the Falklands.

35. *ANAS CRISTATA*, Gm. S. N. i. 540.—*Anas pyrogaster*, Meyen.

Berkeley Sound, E. F. (*Ant. Exp.*); Falkland Islands (*Ant. Exp. and Pack*).

36. *QUERQUEDULA CRECCOÏDES* (King).—*Anas creccoïdes*,

King, Zool. Journ. iv. p. 99; Eyton, Mon. Anat. p. 128.

S. Salvador Bay, E. F. (*Ant. Exp.*); Falkland Islands (*Pack*).

37. *QUERQUEDULA VERSICOLOR* (Vieill.).—*Anas versicolor*,

Vieill. Nouv. Dict.—*A. maculirostris*, Licht.—*A. fretensis*, King; Jard. and Selb. Ill. Orn. pl. 29.

Falklands (*Pack*).

38. *QUERQUEDULA CYANOPTERA* (Vieill.).—*Anas cyanopterus*,

Vieill. Nouv. Dict.—*A. cæruleata*, Licht.—*A. rafflesi*, King, Zool. Journ. iv. 97; Jard. and Selb. Ill. Orn. n. s. pl. 23.

Falklands (*Pack*).

39. *MICROPTERUS CINEREUS* (Gm.).—*Anas cinereus*, Gm. S. N.

i. 506.—*A. brachyptera*, Lath.; Q. et G. Voy. Uranie, pl. 39. p. 139.

—*Micropterus brachypterus*, Darwin, Zool. Beagle, iii. 156.

Falkland Islands (*Ant. Exp. and Pack*).

“Loggerhead Duck: male with the bill orange, irides dark brown, feet olive; female the same, but the bill olive.” (*Pack*.)

#### Fam. COLYMBIDÆ.

40. *PODICEPS CALIPAREUS*, Less. Voy. Coq. Zool. p. 727, Ois.

pl. 45; Darwin, Zool. Beagle, iii. p. 136.

S. Salvador Bay, E. F. (*Ant. Exp.*); Falkland Islands (*Pack*).

“White Grebe: eye bright crimson” (*Pack*).

41. *PODICEPS ROLLANDI*, Q. et G. Voy. Uranie, Zool. p. 133.

pl. 36; Darwin, Zool. Beagle, iii. p. 137.

Berkeley Sound, E. F. (*Ant. Exp.*); Falklands (*Pack*).

“Common Grebe or Black Grebe: eye bright crimson” (*Pack*).

## Fam. APTENODYTIDÆ.

42. APTENODYTES PENNANTII, G. R. Gray, Ann. N. H. xiii. p. 315 (1844).—*A. patachonica*, Shaw; Gould, P. Z. S. 1859, p. 98. Falkland Islands (*Abbott and Pack*).

43. SPHENISCUS MAGELLANICUS (Forst.).—*Aptenodytes magellanicus*, Forst.—*A. demersa*, Abbott, Ibis, 1860, p. 336 (*err.*). Falkland Islands (*Abbott and Pack*).

44. EUDYPTES CHRYSOLOPHUS, Brandt: Abbott in Ibis, 1860, p. 338. Falkland Islands (*Abbott and Pack*).

45. EUDYPTES CHRYSOCOME (Forst.).—*Aptenodytes chrysocome*, Forst.: Abbott, Ibis, 1860, p. 337. Falkland Islands (*Ant. Exp., Pack*).

46. PYGOSCELES WAGLERI.—*Pygosceles papua*, Wagl.—*Aptenodytes papua*, Forst.; Abbott, Ibis, 1860, p. 336; Gould, P. Z. S. 1859, p. 98.

Falkland Islands (*Mus. Brit., Abbott, Pack*).

The name *papua* generally applied to this bird requires alteration, as the bird is not found in New Guinea!

## Fam. PROCELLARIIDÆ.

47. PELECANOIDES BERARDI (Q. et G.).—*Procellaria berardi*, Q. et G. Voy. Uranie, p. 135. pl. 37; Gould, P. Z. S. 1859, p. 98. Falkland Islands (*Q. and G., and Abbott*).

48. THALASSIDROMA NEREIS, Gould, B. Austr. vii. pl. 64, et P. Z. S. 1859, p. 98.

Falkland Islands (*Abbott*). One specimen, picked up dead in March 1858.

49. PROCELLARIA ———?

Capt. Abbott has forwarded eggs of a large species of Petrel from the Falklands, belonging, as Mr. Gould believes, either to *P. gigantea* or *P. conspicillata*.

50. DIOMEDEA ———?, Gould, P.Z.S. 1859, p. 98.

Mr. Gould has described the egg of an Albatros sent by Capt. Abbott, which he believes to be either of *D. fuliginosa* or *D. melanophrys*.

## Fam. LARIDÆ.

51. LESTRIS ANTARCTICA (Less.).—*L. catarractes*, Q. et G. Voy. Uranie, Ois. pl. 38.—*Megalestris antarctica*, Gould, P. Z. S. 1859, p. 98; Abbott, Ibis, 1860. Falkland Islands (*Abbott and Pack*).

52. LARUS DOMINICANUS, Licht. Verz. d. Doubl. p. 82; Gould, P. Z. S. 1859, p. 97.

Falkland Islands (*Abbott and Pack*).





53. *LARUS SCORESBII*, Trail, Mem. Wern. Soc. iv. p. 514 (cum fig.) 1823.—*L. hæmatorhynchus*, King; Jard. and Selb. Ill. Orn. pl. 106.

Falkland Islands (*Pack*).

54. *LARUS ROSEIVENTRIS* (Gould).—*L. glaucotes*, Meyen, Nov. Act. 1834, p. 115 (?).—*Larus maculipennis*, Licht. (?).—*Gavia roseiventris*, Gould, P. Z. S. 1859, p. 97.

Falkland Islands (*Abbott and Pack*).

There is no doubt, I think, that Mr. Gould's type-specimen, now in the British Museum, is in immature (or winter) plumage. The adult bird in full breeding-dress, of which Capt. Pack has forwarded some splendid specimens, has a full dark-brown cap, and the whole of the white plumage deeply tinged with a most beautiful rose-colour. The egg is described by Mr. Gould, *l. c.*

55. *STERNA CASSINII*, Sclater.—*Sterna meridionalis*, Cassin, Zool. U. S. Expl. Exp. p. 385, nec Brehm.—*Sterna antarctica*, Peale, nec Lesson, nec Forster.—“*Sterna wilsoni* et *S. hirundo*, ex Am. Merid.,” auct.

Falkland Islands (*Pack, Abbott*).

This Tern is stated by Mr. Cassin and Mr. Peale to be different from *S. wilsoni* of the United States. “The voice, size, and general habits are so like those of its northern prototypes, *S. arctica* and *S. hirundo*, that it requires comparison to be convinced of the specific difference. But the intensely scarlet bill, which has not a black point like that of the northern bird, the lighter-coloured mantle, and the length of the tarsus destroy their identity.”

Unfortunately both Mr. Cassin and Mr. Peale have proposed names for this bird which have been previously used in the same group.

#### FAM. PELECANIDÆ.

56. *PHALACROCORAX CARUNCULATUS* (Gm.); Bp. Consp. ii. p. 176.—*P. imperialis*, King.—*P. cirrhatus*, G. R. Gray.

Falkland Islands (*Pack, Abbott*).

57. *PHALACROCORAX MAGELLANICUS* (Gm.); Bp. Consp. ii. p. 177.—*P. erythrops*, King.

Falkland Islands (*Pack, Abbott*).

#### 9. ON A NEW SPECIES OF FISH BELONGING TO THE GENUS *PAGRUS*. BY DR. ALBERT GÜNTHER.

(Pisces, Pl. XI.)

*PAGRUS BOCAGII*, Lowe. (Pl. XI.)

D.  $\frac{12}{10}$ . A.  $\frac{3}{8}$ . L. lat. '65. L. transv. 7/17.

The greatest depth of the body is below the fourth dorsal spine, where it is one-third of the total length; the length of the head is

one-fourth of it. The diameter of the eye equals the width of the interorbital space, is one-fourth of the length of the head, and two-thirds of that of the snout. The præorbital is longer than high, and higher than the orbit. There are six series of rather narrow scales between the præorbital and the angle of the præoperculum. Molar teeth in two series,—those of the outer series being conical, pointed, and much larger than those of the inner series. The third, fourth, and fifth dorsal spines are produced, flexible (in immature specimens); the second and third anal spines of nearly equal length and strength, one-third of the length of the head. The pectoral extends on to the vertical from the first soft anal ray, and its length is contained three and a half times in the total; the ventral reaches to the anal fin. Silvery, with red, shining golden stripes along the series of scales; a dark-claret spot on the back beneath the fifth, sixth, seventh, and eighth dorsal rays, extending on the membrane of the fin; a smaller spot on the upper part of the axil; the spinous dorsal, caudal, anal, and ventral fins with the margin blackish.

Length  $9\frac{1}{2}$  inches.

*Hab.* Sea of Lisbon.

This fish forms a new addition to the European fauna. It has been sent to the British Museum by the Rev. R. T. Lowe in a fine collection of fishes made at Lisbon. He proposes to call it after Dr. Bocage, of the Lisbon Museum, in case it should prove to be a new form, and writes:—"It grows very large; I saw one which was 2 feet 10 inches long, and was said to weigh more than 16 lbs. Its head was bright red or vermilion. The elongate dorsal spines are only a conspicuous character in young examples."

10. DESCRIPTION OF A NEW ENTOMOSTRACOUS CRUSTACEAN,  
BELONGING TO THE ORDER PHYLLOPODA, FROM SOUTH AUSTRALIA. BY DR. BAIRD, F.L.S., ETC.

(Annulosa, Pl. LXXII.)

ESTHERIA BIRCHII. (Pl. LXXII. fig. 1.)

The animal appears in all respects to resemble that of the *Estheria gigas*, except that the eye is placed on a more prominent pedicle. The specimen examined was a female, and full of ova. These were disposed all along the body of the parent, were very numerous, and presented a very pretty appearance when seen under the microscope. They are small, round, and grooved, the grooves running in a circular manner like those of a rifle.

The shell or carapace is of a greenish colour, of an oval shape, and flattened. The umbo is anterior, situated about 2 lines from the margin. The dorsal margin slopes slightly downwards, and is dentated on the edge, in consequence of the ridges, with which its surface is strongly marked, terminating at the external edge in a prolongation or tooth. The ventral margin of the carapace is rounded

Fig 1c.

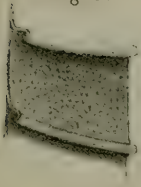


Fig 1

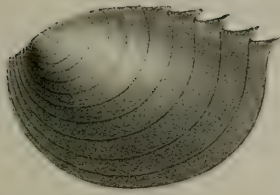


Fig 1d

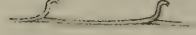


Fig 1e



Fig 1b

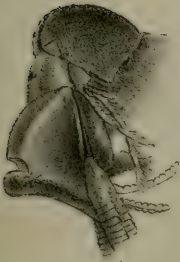


Fig 1a.

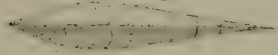


Fig 2.



Fig 2a.



Fig 3b.



Fig 3.

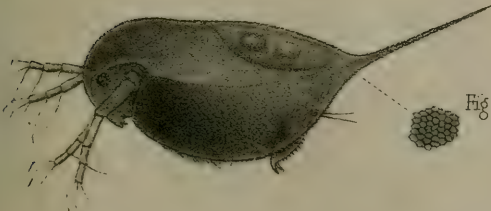


Fig 3c



Fig 3a.



1-1c. Estheria birchni. 2-2a. Streptocephalus dichotomus 3-3c. Daphnia newportii.









C.H. Ford

*Corallium johnsoni.*

W. Wes. 1887

anteriorly, and terminates posteriorly in one of the strong tooth-like prolongations mentioned above.

The surface of the shell is marked with 13 ribs or ridges, which near the umbo are slight, but become stronger, well-marked, and prominent as they descend. The surface between the ridges is different from any previously described; it is rather opaque, not polished, and presents somewhat the appearance of ground glass.

This species is the giant of the family to which it belongs. Of the three specimens in the Collection, the largest measures rather more than a full inch in length, and about three-fourths of an inch in breadth, the other two being slightly smaller. They were sent to the British Museum by Sir W. Denison, Governor of Australia, who in a letter to Dr. Gray informs him that they were taken "in water-holes or lagoons on the plains, on the banks of the Wamoi, a river which discharges itself into the Darling, and ultimately by the Murray into the sea in South Australia." They were collected by Mr. W. Birch, who in a note to the Governor says:—"My attention was first drawn to the Bivalves by observing them *in motion*, apparently in search of food; and until a specimen was obtained, I was under an impression, from the rapidity of their movements, that they were small fishes. Undeceived in this respect, I determined to ascertain, if possible, the means by which the mollusk progressed. I observed that the serrated part of the shell was downward and the valves were in constant motion, and that four antennæ were protruded from the shell, evidently for grasping food. The anatomical structure of the animal appeared so much at variance with other mollusks, that I preserved the specimens intact. I found by experience that if the shells are immersed in tepid water for about ten minutes, the animals will be sufficiently developed for minute observation."

In compliance with Sir W. Denison's request that the name of the collector "should be commemorated in connexion with the species," I have named it *Estheria birchii*.

Magnitude, 1 inch in length,  $\frac{3}{4}$  of an inch in breadth.

*Hab.* Pools of fresh water on the banks of Wamoi River, Australia.

*Mus.* Brit.

11. DESCRIPTION OF A NEW CORAL (*CORALLIUM JOHNSONI*)  
FROM MADEIRA. BY DR. J. E. GRAY, F.R.S., V.P.Z.S.,  
ETC.

(Radiata, Pl. XVIII.)

Mr. James Yate Johnson, the author of an admirable 'Guide to the Island of Madeira,' and who has for years been studying the natural productions of that beautiful island for the purpose of preparing a Fauna of it, having kindly given me some specimens of Corals from thence, I am induced to send the following description of a very in-

teresting specimen of this hitherto very limited genus to the Society.

**CORALLIUM JOHNSONI.** (Pl. XVIII.)

Coral branched, subflabelliform. Branches nearly simple, subparallel, flexuose, with a few very short ascending branchlets scattered on the side of the upper surface. Bark yellow, granular, with three or four rows of rather convex polype-cells on the upper surface of the branches, and with the under side smooth and rounded. The axis white, striated.

*Hab.* Madeira.

This coral differs from the Red Coral of the Mediteranean and of commerce in several important particulars. That coral, which generally grows from the under-surface of ledges of rocks in a pendent position, has the polypes equally scattered on all sides of its branches, and thus the animal can obtain food with equal facility on all sides of the coral.

The Madeiran coral, on the contrary, seems to grow in a fan-like manner, spreading out horizontally from the rock or other marine body to which it is attached; and it has the animal placed on each side of the upper surface of the stem and branches, as though the animal could only obtain nourishment on that part of the coral which is exposed to the light, or at least is parallel with the surface of the sea.

This is the case with many, indeed I may say with all the corals which grow in this expanded, fan-like manner.

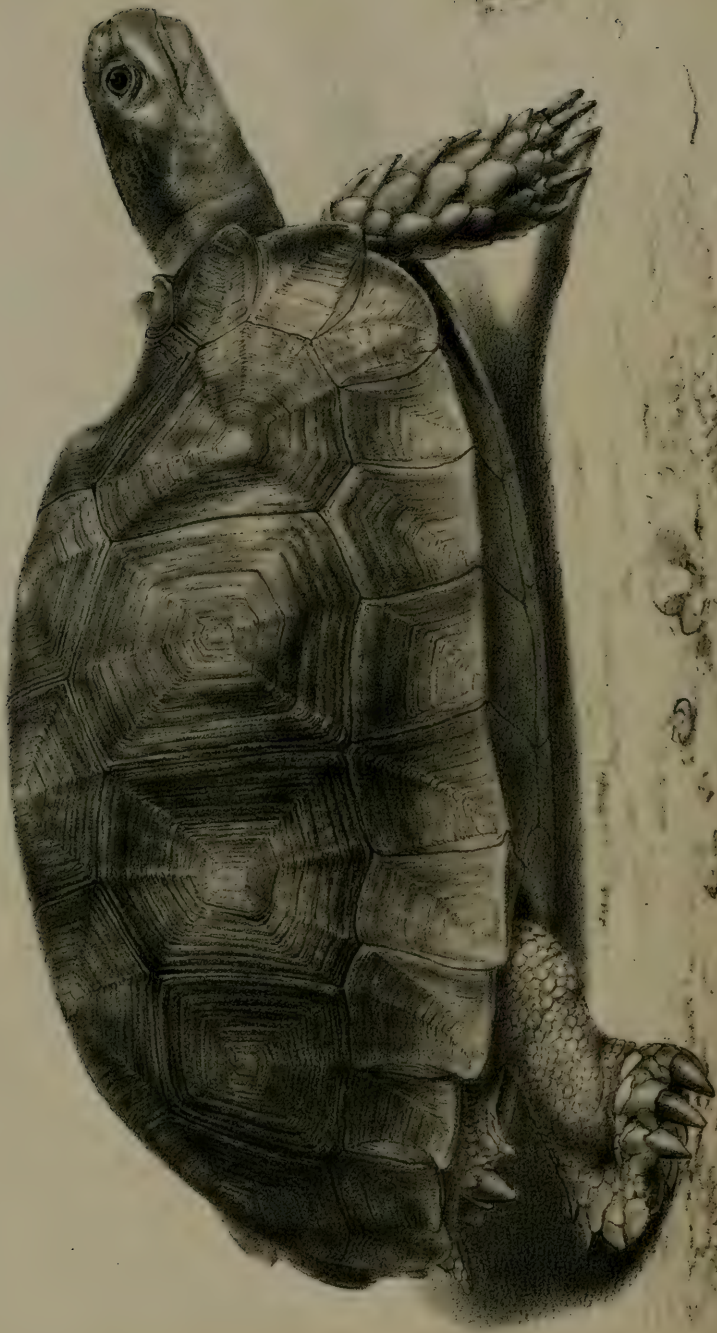
There is a species of coral which grows, and has the animal likewise distributed in the same manner, which is found in the seas near the Sandwich Islands, and has hence been called *Corallium secundum* by Mr. Dana, but it is very different from the species here described. The Madeiran coral is easily distinguished from that described by Mr. Dana by the colour of its bark and axes, and the thick, elongated, subsimple, subparallel branches.

Secondly, this Madeiran coral appears to be normally of a white colour, while the Mediterranean coral is of a bright crimson-red, and has hence been called *Corallium rubrum*. The latter is sometimes bleached white, or becomes so from some defect or malady in the animal: it is rarely found naturally white, or more generally with some portion of the coral white. I have never seen it naturally of this colour, but I have seen some specimens with white portions; and I have been informed that these portions have been bleached by the sudden application of heat or some other process. The Madeiran coral, on the contrary, seems to be always white.

The "White Coral" of commerce is a species of *Caryophyllia* of Lamarck.

If this coral could be obtained in any quantity from Madeira, it would be a beautiful object for jewellers, and I have no doubt fetch a good price.





12. ON THE GENUS MANOURIA AND ITS AFFINITIES.  
 BY DR. JOHN EDWARD GRAY, F.R.S., V.P.Z.S., ETC.

(Reptilia, Pl. XXXI.)

In the 'Proceedings' of this Society for 1852, p. 133, I described, and in the quarto Catalogue of the 'Shield Reptiles in the Collection of the British Museum' I described at greater length and figured, the imperfect shield of a Tortoise which had long been in the possession of the Society, under the name of *Manouria fusca*.

Dr. Cantor, in his 'Catalogue of the Reptiles of the Malayan Peninsula,' describes a specimen of the same Tortoise under the name of *Geoemyda spinosa*, considering it as the adult of that curious and interesting species, and most unjustifiably copies my description of the animal of that Tortoise as that of the animal belonging to the shell which he was describing.

Dr. Cantor sent the specimen here referred to, to the East India Company, and it has passed from them into the Collection of the British Museum, so that there can be no doubt about the identity of the two animals.

Mr. Le Conte, in the 'Proceedings of the Academy of Natural Sciences of Philadelphia' for October 1859, vol. vii. p. 187, describes a Tortoise from Java under the name of *Teleopus luxatus*, which evidently belongs to the same genus, and is probably the same species which I had previously described and figured under the name of *Manouria fusca*.

When I first described the genus from a shell in a very imperfect condition, I referred it to the family *Emydidæ*, on account of its "depressed form and the divided caudal plate."

Dr. Cantor, in the Catalogue above quoted, not only refers it to that family, but considers it a species of the genus *Geoemyda*, and describes the animal as having the feet of that genus, which are provided with strong, separate toes.

Mr. Le Conte seems to have had a perfect animal, for he describes the feet thus:—"Toes and claws 5·5; fore-claw long and rather sharp: hind-feet clavate; claws nearly globular, the inner one wide and flat, the edge sharp-edged:" yet he places the genus *Teleopus*, in his arrangement published in the same volume of the 'Philadelphia Proceedings,' between *Platysternon* and *Lutremys* with the true *Emydes*, observing that "it possesses a strong mixture of the characters of this family with those of the next."

The British Museum has just acquired from Mr. Gould a very fine and perfect specimen of the genus, which he received with a series of skins of Kangaroos and other Australian mammalia and reptiles from Australia, thus enabling me to lay before the Society a completion of the character of the genus before established from the examination of an imperfect specimen of the shell alone, to correct the position of the genus in the order, and to show the geographical arrangement of the single species on which it is founded.

The genus *Manouria* is a typical Land Tortoise (*Testudinidæ*), which verifies the fact stated by Dr. Cantor, that it is "found on

the great hill at Pinang at a distance from water." Like the other genera of that family, it has very short toes on both the hind and fore feet, which are all united together into a club-like foot, with only the claws separate,—very unlike the distinct, more or less webbed toes of the Freshwater Tortoises or *Emydidæ*, with which it has been hitherto united. Its fore-feet are covered with very large, thick, triangular scales, like the feet of the genus *Kinixys*; and it has the spur-like conical scale, situated between the hinder thigh and the base of the tail, which is found in several genera of this family.

It is easily known from all the other genera of the *Emydidæ*, and from the more terrestrial genera of the family, by the small size and position of the pectoral plates and the divided caudal plate.

The pectoral plates in some genera of the Freshwater Tortoises, as in *Kinosternon* and *Sternotherus*, are smaller than the other plates, and narrowed on the inner edge; but I do not know of any genus where they are reduced to such a small size and removed so far towards the outer edge of the sternum as in the one under consideration.

The separation of the caudal plates, which is universal in all the Freshwater Tortoises and Marine Turtles which have come under my examination, is not found in any other genus of Land Tortoises that I am aware of: but in several species of the true *Testudines* there is a more or less distinct groove, showing where the plates are united; and in *Manouria* they are quite separate.

The head is covered with symmetrical small shields. The jaws are crenulated on the edge, without any distinct sharp hook at the top of the upper one. The neck is covered with small granular scales. The fore-feet are depressed, club-shaped, covered with large, thick, triangular, sharp-tipped shields, forming five rather irregular rows on the front or upper surface. The outer side of the under surface and the soles of the fore-feet are covered with large flattened plates. The fore-claws are five in number, large, thick, conical, acute, and nearly of an equal size, the outer one being rather the smallest. The hind-feet are large, with four very large, strong, conical, acute claws, the outer one on each foot being rather smaller than the others, which are all of equal size. The soles of the hind-feet are covered with large unequal-sized scales—those on the hinder edge being largest, thick, conical, trihedral, and prominent.

On each side of the hinder part of the body, near the tail, is a group of large triangular scales,—the hindmost, nearest the base of the tail, being very large, conical, and prominent, forming a large spur.

Tail short, conical, with three rows of flat shields above, and three or four rows of squarer, smaller ones beneath.

The *Manouria fusca* appears to inhabit Pinang, where Dr. Cantor says it is "found on the great hill at Pinang at a distance from water;" also Java, as I cannot discover from Mr. Le Conte's description that there is any specific difference between his *Teleopus luxatus* and my species from Pinang; and likewise Australia, for the specimen which we have received from Mr. Gould is marked the "Murray River Tortoise," and it came with a collection of the skins of mammalia and reptiles which are all Australian. There is very little difference



between the three specimens of this Tortoise which we have in the British Museum Collection, two of them from Pinang and the other from Australia. They vary a little in the size and form of the pectoral plates, and in the size of the axillary and inguinal plates, but not more than is the case with other Tortoises of the same species.

13. DESCRIPTIONS OF SEVENTEEN NEW SPECIES OF MARINE SHELLS, FROM THE SANDWICH ISLANDS, IN THE COLLECTION OF HUGH CUMING. BY W. H. PEASE.

1. *VITULARIA SANDWICENSIS*, Pease.

Shell fusiformly ovate, rather thin, white, with about three transverse rows of brown spots on varices; whorls five, sharply angulated, body-whorl angulated just below the suture; varices six, slightly oblique, wrinkled; aperture white, oblong-ovate, outer lip denticulated within; columella slightly arched; canal short.

2. *RANELLA PRODUCTA*, Pease.

Shell solid, small, depressly pyramidal, sublanceolate, ribbed longitudinally, ribs overlapping at the sutures, and cancellated by transverse granulate ridges, lateral varices compressed, arranged like the ribs by overlapping; aperture small, oval, coarsely lyrate within; canal short, recurved; colour chalky-white.

3. *RANELLA LUTEOSTOMA*, Pease.

Shell ponderous, solid, ovately turreted, varices prominent, nodulous and canaliculated; spire consisting of about six angulated whorls, girdled with a close series of granular belts, the upper and lower generally the most prominent, and the angle traversed by a row of bipartite nodules, which latter are continued on the upper third of the body-whorl; body-whorl angulated above, beaded like the spire, and beneath the bipartite nodules are alternate series of granular belts and obsolete raised lines, four rows of the former and five of the latter; columella arched, closely wrinkled, wrinkles more distant and larger at the extremities; outer lip much thickened, flat and coarsely denticulated within; aperture oval, canaliculated at both extremities; colour pale-yellow, variegated with more or less distinct transverse articulated brown lines, lips yellow passing into white within the throat, denticulations and the upper and lower wrinkles on the columella white.

4. *DISTORSIO PUSILLA*, Pease.

Shell solid, oblong ovate, gibbous, somewhat distorted, four or five varices; whorls beatifully latticed, with rather coarse granular raised ridges and fine microscopic spiral striæ; aperture small, narrow; outer lip thick, strongly dentated on inner edge and sinuated above; columella deeply excavated and plicately toothed; canal short.

Only a single specimen has been found, too much faded to determine its colour. It is pale yellow, with faint traces of brown.

5. *CONUS NEGLECTUS*, Pease.

Shell solid, slightly swollen above, orange-brown, girdled with a white belt on the middle and an obsolete one at the superior angle, base purple-black; surface faintly decussately striated, lower half with small spiral ridges; spire depressed, its profile very slightly convex; aperture narrow and straight, interior white, tinged with orange on the edge, and two large deep-purple spots within; epidermis thick, opaque, velvety, dusky or fulvous brown.

6. *CONUS FUSIFORMIS*, Pease.

Shell small, fusiform, attenuated at both ends, closely and regularly grooved spirally, and reticulated by fine irregular longitudinal striæ; spire acuminate, sharp; whorls encircled by two granulose ridges, sutures marginated; aperture narrow, rather more than half the length of the shell; colour dark chocolate-brown, with a row of irregular white spots on upper edge, margin of the sutures light yellowish-brown.

7. *FOSSAR MULTICOSTATUS*, Pease.

Shell small, thin, globose, of a chalky-white colour, spire small, acute, consisting of three or four moderately convex whorls separated by a linear impressed suture; surface ornamented with a nearly uniform series of small, rather sharp spiral ridges, and the interstices decussately striated with fine raised lines, of which the spiral are most developed, periphery of the last whorl rounded and narrowly umbilicated; columella slightly oblique, scarcely arched, covered with a thin callous deposit and slightly sinuous at the base; aperture large, subcircular, lip thin, crenulated by the external spiral ridges.

8. *TURRIS MONILIFERA*, Pease.

Shell fusiform, turreted, light brown; whorls numerous, encircled with a row of semitransparent slightly oblong tubercles, disposed in a somewhat imbricated manner, with a prominent keel between and a lighter one just below the rows of tubercles, interstices concave, ornamented with raised striæ, and crossed by oblique lines, last whorl encircled by raised striæ, which are most prominent on upper part; aperture ovate; canal rather long, slightly recurved.

9. *STROMBUS CANCELLATUS*, Pease.

Shell solid, abbreviate, somewhat fusiformly ovate; spire short, acute; whorls seven or eight, subangulated above, latticed with longitudinal ribs (or ridges) and spiral lines, margined next the sutures, about three varices to each whorl; sutures well impressed, last whorl irregularly verrucose on the back at the upper part, and latticed like the spire; outer lip thin, slightly thickened behind; columella strongly callused and closely wrinkled throughout; aperture narrow, contracted, lyrate and granulose within.

All the specimens found of this species have had the outer lip fractured and repaired. The nearest allied species is *S. hæmastoma* (Sow.).

10. *AMATHINA BICARINATA*, Pease.

Shell thin, subpellucid, triangularly ovate, contracted posteriorly; colour vitreous-white; traversed by longitudinal, diverging, irregular-sized ribs, two of which are more prominent than the others, giving the shell a somewhat bicarinated appearance, and crossed by fine, close, concentric lines of growth; spire consisting of one evolution, recurved laterally and projecting beyond the posterior margin of the shell; aperture oval, edges smooth; epidermis thin, membranaceous, covering the entire shell.

11. *CORALLIOBIA CANCELLATA*, Pease.

Shell small, rather solid, depressly ovate, white; spire concealed by the upper termination of the outer lip; surface coarsely latticed with longitudinal and transverse ridges, the former disposed so as to give the surface an imbricated appearance; columella smooth, very slightly arched, and attenuated below; outer lip widely dilated; aperture large, extending the whole length of the shell.

A singular species, resembling somewhat a minute *Concholepas*, and allied to *R. madreporarum* (Sow.). Only a single dead specimen found.

12. *RHIZOCHILUS EXARATUS*, Pease.

Shell abbreviately ovate, deeply umbilicated; spire short, acute, less than one-half the length of the shell; whorls about six, convex, subangulated, the last large and gibbous, encircled with small, close, irregular, minutely scaled ridges and longitudinal ribs, ribs slightly oblique and becoming obsolete or altogether wanting on body-whorl; aperture wide, semicircular, finely and closely lyrate within; outer lip thin; inner lip produced so as to form an even surface with the outer lip, smooth and slightly arched; canal very short and slightly recurved; colour dirty-white.

13. *COLUMBELLA PELLUCIDA*, Pease.

Shell elongate-oval, turreted, thin, pellucid, smooth, shining; spire prominent, consisting of six or seven volutions; apex obtuse; whorls smooth, plano-convex, last whorl but slightly swollen, and furnished with close obliquely transverse impressed striæ on the basal half; suture impressed, and margined below with a fine spiral impressed line; aperture about one-half the length of the shell, oblong oval, slightly effuse above; outer lip simple; columella smooth, slightly arched; whitish horn-colour; last whorl ornamented with one or two rows of oblong brown spots and an opaque white spot, intermediate rows extending to and encircling the lower part of the upper whorls near the suture.

14. *COLUMBELLA LINEATA*, Pease.

Shell small, solid, fusiform, turreted, whitish or variously marked with reddish brown; spire acute; whorls plano-convex, smooth, the last somewhat ventricose, and spirally striated at the base; canal produced; sutures faintly impressed; outer lip thickened by a stout

outer varix, and dentated within; columella smooth, strongly arched; aperture small, tortuous.

15. *SCALARIA MILLECOSTATA*, Pease.

Shell small, pyramidal, white, thin; whorls nine, contiguous, rapidly enlarging, rounded, the last one ventricose and perforated at the base; varices numerous, crowded, appearing like raised lines; sutures deeply impressed; aperture rounded.

16. *SCALARIA FUCATA*, Pease.

Shell elongate, imperforate, white, with a spiral brown band on the periphery of the whorls; whorls 8-9, rounded, separated and closely decussately striated with fine raised lines; varices 7-8, distant, compressed, rather large, continuous and toothed above; aperture abbreviately oval.

17. *CIRSOTREMA ATTENUATUM*, Pease.

1962 Shell small, elongate, solid, imperforate, slightly distorted; spire obtuse; whorls plano-convex, nodulous at the suture, encircled with fine, close spiral lines, upper whorls longitudinally ribbed; varices few, irregular, suture faintly impressed; outer lip thickened by an external varix; aperture oval.

14. REVIEW OF THE GENUS *TENAGODUS*, GUETTARD.

By OTTO A. L. MÖRCH OF COPENHAGEN.

Worm-tubes, with a branchial slit, were figured by Aldrovandus, Buonanni, Rumphius, and Argenville; but this character, either overlooked or regarded as accidental, was first described by the accurate Lister in his 'Historia Conchyliorum,' pl. 548. fig. 2: "Vermiculus fissura quadam secundum volutas insignitus." A porous slit was first described by Linnaeus, although Rumphius first figured the same species. Guettard, 1776\*, in his, for the time, admirable treatise on 'Worm-tubes,' first recognized the generic value of the slit—a view adopted by Bruguière, Lamarck, and most subsequent authors, under the new name *Siliquaria*, preoccupied by Forskål for a genus of plants.

Lamarck supposed *Tenagodus* to belong to the Annelides. Blainville brought it first, guided by conchological reasons, to the Mollusca, close to *Vermetus*; but erroneously imagined, from the median position of the branchial slit, that it had affinities with the animal of *Fissurella*.

In the year 1829 Audouin† set the question respecting the molluscous nature of the genus at rest; but it was first in 1836 that Philippi, in his 'Enumeratio,' gave a clear description and figure of the animal and its operculum.

Montfort, too, has given some account of the animal; but one part

\* Guettard arranged the *Tenagodus*, figured by Davila, pl. 21. f. L, in the genus *Tulaxodes*, because he regarded the *septa* more important than the pores.

† Audouin, Société Philomatique, 1829; Annales des Sciences, 1829; et Rang, Manuel, p. 188.

of his description is taken from an Annelide, and the other part is founded on a fragment of a shell found on the deck after a storm in the Bornean sea—very likely the *Ianthina exigua*, which, like *Siliquarius*, has a deep notch in the lip, and is of about the same diameter as the specimen figured: “Il flotte et nage dans la mer et il enfle son manteau en forme de voile.”

Dr. Gray has formed for the genus a section *Siliquarina* in the family *Vermetidæ*. It seems to me to have the same relation to *Vermetus* as *Haliotis* to *Stomax* and *Delphinula*. *Tenagodus* differs principally from *Vermetus* in the operculum, which is spiral like that of *Torinia*, composed of a spiral band ciliated at the margin, forming a cylinder or cone the axis of which is filled up by a series of spiral radiating cells, and which in the last whorl looks like a *Robulina* or *Semen medicaginis* (subgenus *Siliquarius*). In *Siliquaria lactea*, Lam., the axis is filled up with transverse parallel septa without radiating cells (subgenus *Pyxipoma*, Mörch). The marginal spiral band appears composed of radiating bristles, united at their base by corneous matter, only leaving the points free. Dr. Chenu has figured (in his ‘Manual,’ p. 321, f. 2308\*) an operculum quite different from those I have seen, and which, if correct, must belong to a distinct genus, perhaps to the typical *Tenagodi*. The fetal shell is wanting in all the specimens I have seen, except in *Siliquaria lactea*, where it has the form of *Ampullaria*, the under part of the outer lip being produced, and of a brown colour. Chemnitz has described the young shell as *Helix incisa*, and Brocchi as *Serpula ammonoides*. Sowerby, in his ‘Genera,’ first showed the real nature of the former, and Bronn of the latter. In the subgenus *Siliquarius* the surface of the shell is curiously fissured transversely in a manner I do not recollect to have seen in any other shell. I am very much inclined to regard this outer layer as a calcareous epidermis, like that of *Lucina pennsylvanica*, *L. tivela*, and *Margaritifera*. In *Siliquarius lacteus* this layer is very little developed. The aperture is round and simple in all the specimens I have seen. Martini has figured (pl. 2. fig. 13 B) a species with the outer lip strongly dentated. Perhaps it is *Siphonium nebulosum*, Dillwyn, with rubbed spines. The slit is wanting in some species in the first whorls; in all it becomes closed more or less with age. In the subgenus *Pyxipoma* it is closed by a lamella, but not filled up outside.

In the fossil species *Siliquaria dubia*, DeFr., and *S. lima*, Lam., the slit is very short like that of *Pleurotoma*; in the fossil genus *Agathirses* it appears to be different.

The typical *Tenagodi* seem, according to Rumphius, to live on rocks and corals. The subgenus *Siliquarius* lives always in sponges like *Vulsella*. The only affixed species is the fossil *S. florina*, DeFr., figured by Dr. Chenu on *Cerithium giganteum*; perhaps it must form a new genus, if not the young of *Agathirses*, Montfort.

*Tenagodus* is only found in tropical seas (East and West Indies); *Siliquarius* is subtropical. *Pyxipoma* is found in Australia, the West Indies, and perhaps at the Cape of Good Hope.

\* Perhaps copied from Adams’s ‘Genera.’

The longest species is found in the Mediterranean; the most ponderous at Port Essington (Australia).

### DESCRIPTIONES SPECIERUM.

TENAGODUS, Guettard, Mém. 1774, p. 128.

*T. in gyris obliquis contorta, substantia dura læviuscula nitida, plerumque squamifera, striis incrementi simplicibus; apertura postice elongata. Animal et operculum ignota.*

If the figure of the animal of Audouin (Chenu, Ill. et Leçons) is represented of the natural size, it belongs probably to this genus, as Rang asserts the specimen was brought from the East Indies by Dr. Busseuil of the frigate 'Thetis.' The known species of the following section, *Siliquarius*, from the East Indies, are all of a comparatively small size. Perhaps it may be the *Tenagodus gigas*, Lesson, brought from the Moluccas by 'la Coquille' about the same year. I suppose that Rumphius describes the operculum in the following passage: "*Solen anguinus* van binnen met diegeylk een slymerig Deer, en een getand Mytertye voor in den mond." I suppose that the cilia of the operculum are meant by "getand;" but we cannot depend much on the text of Rumphius, it having been written originally in Latin, and translated after the death of the author into the Dutch language.

1. TENAGODUS ANGUINUS, (*Serpula*) Linn. 1758.

*a. Testa semiadulta, typica.*

*Solen anguinus*, Rumph. t. 41. f. H.

*Serpula anguina*, Linn. S. N. ed. 10. p. 700, excl. var.  $\beta$ .

*Serpula anguina*, var.  $\beta$ , L. Mus. Lud. Ulr. 701. no. 431; Linn. Syst. Nat. ed. 12. p. 147. no. 804. *p. 1267 no 80*

*Tubulus testaceus solitarius, anguinus*, p. p., Mart. Conch. Cab. f. 14 (copy).

*La Chenille*, Favanne, p. 653, t. 6. f. M (copy).

*Serpula volvox*, Dillw. p. 1079. no. 26 (founded on Favanne); Wood, Index, *Serpula*, f. 25 (copy).

*\beta. Testa adulta. S. muricata, Born.*

*T. albescens pallidissime aurantio tincta; liris 10 parum prominentibus, squamis sparsis ornatis; interstitia lirarum levigata, rugis transversis distantibus, unde obsolete foveolata, interstitio magno subventrali lirula abrupta; apertura elongato-trigona.*

Long. 54 cm., alt. aperturæ 10 mm. (*Mörck*)\*.

*Serpula muricata*, Born, Testacea, p. 446. t. 18. f. 16.

*Serpula anguina*,  $\beta$ , Born, Index.

*Serpula anguina*, Shaw, Miscell. xiv. 575 (from Born).

*Hab.* Moluccas (coll. Cuming). Specimen unicum.

\* The length is measured with a string; as the first whorl is always wanting, it is not very exact.

It is evident that Linneus, in the tenth edition, regarded the spined form as the type, figured by Rumphius, from whom the specific name was borrowed. This is still more evident by the synonyms of the variety  $\beta$ , which all belong to the subgenus *Siliquarius*. Rumphius says his shell is white, which proves it must be *S. muricata*, Born, and not the following. In the Linnean collection, according to Mr. Hanley, several species of *Tenagodus* are to be found.

2. TENAGODUS RUBER, (*Anguinaria*) Schum. 1817.

*Differt a præcedente. T. gracilior solidior et tamen liris 6 validioribus interstitia fere æquantibus. Squamæ parvæ, in liris internis approximatae; liræ externæ rudes, obsolete nodulose; interstitia costarum foveis quadratis obsolete. Sculptura aperturam versus obsoleta. Color saturate purpureus.*

Long. 24–25 cm., alt. ap. 6–7 mm.

*Anguinaria rubra*, Schum. Essai, 1817, p. 262 (excl. syn. Mart. f. 13, 14).

*Siliquaria muricata*,  $\beta$ , Lam. Hist. v. 338?; Chenu, Illustrations, p. 2. pl. 2. f. 14?

*Siliquaria sulcata*, Gray, List of Genera, Proceed. 1847, no. 261.

*Hab.* Moluccas.—One specimen in the collection of Mr. Cuming; about ten specimens are found in the different collections of Copenhagen.

3. TENAGODUS POLYGONUS, (*Siliquaria*) Blv.

Var. *Dunkeri*.

*T. annulatim convoluta, liris prominentibus et regularibus 10–11, externis validioribus, internis approximatis parvis, squamis minutissimis (detritis) ornatis. Interstitia lirarum plana transversim rugulosa unde irregulariter foveolata. Rima regulariter pertusa, aperturam versus utrinque denticulata, poris elongatis approximatis, dissepimentis angustis arcuatis. Color cretaceus pallidissime roseo-tinctus.*

Long.  $22\frac{1}{3}$  decim., alt. aperturæ circ. 6 mm.

Specimen dealbatum extat in coll. cl. Dunkeri.

Perhaps this variety might prove a distinct species; but as I have not seen the *T. polygonus*, I cannot yet decide the question.

Subgenus SILIQUARIUS, Montfort.

*T. spiraliter (plus vel minus) contorta, substantia calcarea molli, cortice peculiariter transversim fissurata. Operculum spirale, centro cellulæ radiantibus.*

Sect. A. *Rima porosa.*

4. TENAGODUS (SILIQUARIUS) CUMINGII, Mörch.

*T. anfr. 5 primis scalariformibus, postice angulatis, angulo in anfr. ultimis evanescente; inferne granuloso-lirata, liris distantibus, interstitiis huc illuc lirula intercalante; transversim leviter*

*furcato-fissurata, fissuris in anfr. ultimis evanescentibus. Regio umbilicalis longitudinaliter undulato-striata, sulcis radiantibus distantibus sigmoideis decussata. Rima poris oblongis irregularibus plerumque geminatim confluentibus, in anfr. 8 primis clausis; rima in anfr. ultimo aperta utrinque color denticulata. Color albus, nebulis ferrugineis.*

Long.  $22\frac{1}{2}$  cm., diam. circ. 6 mm.

*Operculum alveolariforme (farinosum) pallide flavum, gyris 11, margine pulcherrime ciliato; area centralis parva saturate castanea nitida, obsoletissime impresso-punctata, late umbilicata; segmentis radiantibus bullatis leviter flexis circiter 11, sulco profundo peripherico circumscriptis; lamina marginali latissima pallide flava.*

Diam. 4 mm., alt. 3 mm.

*Siliquaria anguina.* Blainv. Man. t. 1. f. 11?

*Hab.* Ins. Philippin. (coll. Cumingii). Specimen unicum.

Among the whorls are the remains of a sponge, with spiculæ subulate at both ends.

Var.  $\alpha$ . RUDIS.

*T. trochlearis, crassa, anfr. inferne planatis, umbilico pervio, liris granulis validis approximatis asperis.*

Long. 15 cm., alt. aperturæ 4 mm.

*Hab.* Ins. Philippin. legit H. Cuming (coll. Dunkeri).

Rumph. t. 41. no. 2?

Var.  $\beta$ . CONIFER.

*S. anguina,* Chenu, Man. p. 321?

*T. valida, poris rotundis geminis rarius confluentibus.*

Diam. 5 mm.

*Operculum concavo-conicum, apice (casu?) truncato, gyris 13; area centralis lata, centro profunde et anguste umbilicato; segmentis radiantibus 15 planatis, canali peripherico excavato circumscriptis; lamina marginali angusta bipartita, annulo inferno castaneo, externo flavo.*

Diam.  $3\frac{3}{4}$  mm., alt.  $4\frac{1}{2}$  mm.

This operculum differs from that of the type by its deep and rather narrow umbilicus, by its much larger central area, and by its narrow marginal ring, which in the specimen appears damaged. The sides are concave, not convex, and the height is greater. The interstices of the whorls are in many places filled up with a chalky white matter.

Whether these differences are of specific value, or depend on age or on long desiccation, I cannot judge, having seen only a single operculum of this variety; I cannot discover important differences between the shells.

*Hab.* Ins. Philippin., H. Cuming legit (coll. Dunkeri, specimen fractum).



Var.  $\gamma$ . PLATYOMPHALA.

*T. læviuscula*, *liris distantibus obsoletissime granulatis*.

Diam. 5 mm., long. 18 cm.

*Operculum cylindricum, apice late (casu?) truncato, gyris 10; area centralis lata planiuscula, umbilico fundo plano et obliquo, segmentis radiantibus, sulcis intermediis rectis, canali peripherico profunde impresso; lamina marginali angusta bipartita annulo interno castaneo, margine externo flavescente.*

Diam.  $3\frac{3}{4}$  mm., alt. 3 mm.

*Hab.* Ins. Philippin., legit H. Cuming.

The operculum most like that of var.  $\beta$ ; but the umbilicus is not deep, and has a flat bottom. The sculpture of the shell appears very different, but the size of the granulation varies much in the same individual. In case the difference of the operculum (as in *Serpula*) should prove specific, I have named the variety with reference to the umbilicus of the lid.

Var.  $\delta$ . LUMBRICALIS, Rumph. t. 41. f. N 1?

*T. crassa*, *lirulis compressiusculis, granulatis obliteratedis*.

Long. 22 cm., diam. 5 m.

*Hab.* Ins. Philippin. (coll. H. Cumingii). Specimina 3.

One of the specimens has a spiral impression under the porous slit.

Var.  $\epsilon$ . LÆVI-LIRATA.

*T. gracilis*, *liris angustissimis lævigatis, poris rotundis distantibus rarius confluentibus, rima aperturam versus simplice. Color albus sordide flavescens.*

Long. 17 cm., diam. aperturæ 5 mm.

*Hab.* Singapurhra (coll. Cumingii). Specimen unicum.

This variety seems a good species if the smooth liræ prove constant; but the preceding is exceedingly like it.

Var.  $\zeta$ . JAPONICA.

*T. gracilis*, *crassa, liris angustis læviusculis approximatis, in anfr. primis divaricatis (an morbo?). Rima in anfr. ultimis simplici; poris approximatis rotundis fere confluentibus. Color albus inferne fascia ferruginea lata irregulari.*

Long. 18 cm., ap. diam.  $4\frac{1}{2}$  mm.

*Hab.* Japan (coll. Cumingii). Not unlike Rumph. t. 41. f. N 1.

## 5. TENAGODUS (SILIVARIUS) TOSTUS, n. sp., Mörch.

*T. tenuiuscula*, *spira turbiniformis, liris disjunctis angustis læviusculis obsoletissime undulato-granulatis, granulatis distantibus. Rima utrinque linea undulata marginata, poris immersis ellipticis subregulariter distantibus. Color albus; anfr. ultimi inferne pallide ferruginei, anfr. 4 et 5 saturate castanei.*

Long. circ. 12 cm., apert. diam. 5 mm.

*Siliquaria anguina*, Chenu, pl. 1. f. Y, non absimilis.

*Hab.* Ins. Ceylon (*E. L. Layard*), specimen unicum.

This species differs chiefly from the last in the elliptical distant pores, the slit being bordered by a narrow elevated undulated line on both sides. Except in the last whorl, the slit seems situated on the top of a feeble carina. Although the shell is smaller, the aperture is larger than in the preceding.

6. TENAGODUS (SILICUARIUS) AUSTRALIS, Quoy & Gaimard.

Var.  $\alpha$ . SCALARIFORMIS.

*T. anfractibus 6 subregulariter spiraliter contortis, tenuiusculis, postice angulatis, inferne liratis, oblique obsolete sulcatis, transversim conferte laminato-fissuratis; apertura dilatata. Rima utrinque undulato-dentata, dentibus in anfr. primis tangentibus unde poris rotundis approximatis. Color candidus, inferne ferrugineus ad basin testæ.*

Long.  $21\frac{1}{2}$  cm., diam. ap. 11 mm., alt. 14 mm. (circiter).

*Operculum subcylindricum medio paululum contractum, gyris circiter 13, truncatum (casu?); area planiuscula, centro impresso sed non umbilicata; segmentis radiantibus angustis circiter 15 interdum obsolete bifidis, arcuatis vel leviter signoideis sulco peripherico profundo circumscriptis; lamina marginali angusta dilute castanea, margine radiatim dense lirato, liris in cilia brevissima euntibus.*

Diam. 6 mm., alt. 8 mm.

Australia (coll. Cuming.), specimen unicum.

The specimen looks somewhat like *Scala scalaris*, and is not unlike the top of the figure 1 r. pl. 1 in Chenu's 'Illustrations.' I am not quite sure that this is not specifically different from *S. australis* in Chenu's 'Illustrations.'

Var.  $\beta$ . MULTILIRATA.

*T. spiralis irregulariter contorta, longitudinaliter liris angustissimis perspicuis, interstitiis lirula intercalante. Rima aperturam versus clausa; poris rotundis plerumque fissura conjunctis in anfr. primis 3 clausis; apex decollatus, dissepimento conoideo clausus.*

Long.  $21\frac{1}{2}$  cm., diam. ap. circiter 10 mm.

Australia, specimen detritum in coll. Dunkeri.

Var.  $\gamma$ . TENIATA, Adams, Genera, t. 39. f. 5 d.

*T. laxè spiralis, longitudinaliter liris angustis parum prominentibus; rima aperturam versus simplex, utrinque acuta, in anfr. superioribus utrinque undulato-dentata, dentibus sæpe tangentibus unde poris ovalibus, in anfr. 5-6 primis clausis. Color testæ albus, strati externi ferrugineus; rima utrinque lineis castaneis marginata.*

Long. 30 cm., diam. ap. 12 mm.

*Silicuaris anguilus*, Montfort, fig. p. 39, simillima.

*Operculum cylindricum late truncatum (casu?) gyris 6; area inflata, centro profunde immerso, segmentis radiantibus angustis*

*circiter 22 convexiusculis, sulco peripherico impresso circumscriptis; lamina marginalis bipartita, annulo interno angusto saturate castaneo nitido, externo radiatim dense lirato, liris in cilia minuta triangularia euntibus.*

Diam. 9 mm., alt. 7 mm.

This operculum differs chiefly from that of var.  $\alpha$  by its great convexity round the centre.

The specimen in the collection of Mr. Cuming is marked "Mediterranean;" but in the interior were found rudiments of an *Elenchus*, a genus only found in Australia. It is so closely allied to the preceding variety, that I do not doubt it is the same species, although the Mediterranean often affords species closely allied to Australian.

Var.  $\delta$ . FERRUGINEA, *linea castanea infra rimali.*

*T. gracilis, obsolete longitudinaliter lirulata; saturate ferruginea aperturam versus albescens.*

Long.  $10\frac{1}{2}$  cm., diam. apert.  $1\frac{1}{2}$  mm.

This and the following must be regarded as young specimens, although the diameter of the whorls is less than that of the preceding.

*Hab.* Australia (coll. Cuming.).

Var.  $\delta^*$ . *Præcedenti simillima sed spira turbinata.*

South Australia (coll. Cumingii), specimen unicum.

Sect. B. *Rima simplex; apex plerumque halioideois; primus fissuram nullam habet.*

7. TENAGODUS (SILIQUARIUS) OBTUSUS, Schum. 1817.

*Siliquaria anguina*, Philippi, Enumeratio, i. p. 173, t. 9. f. 24; M. Gray, Figures, i. pl. 58. f. 1 (copy).

*Tenagodus anguinus*, Adams, Genera (copy).

*Serpula anguina*, Born, Index, p. 457; Born, Testacea, p. 440, t. 18. f. 15; Shaw, Miscel. (copy from Born).

*Anguinaria obtusa*, Schum. Essai, p. 262.

$\beta$ . *Serpula annularis*, Dillwyn, 1817, p. 1081. no. 29; Wood, Index, f. 28 (copy); Buonanni, i. 20. no. C; Scilla, de Corporibus, t. 12. f. 3, p. 55 (copy); Mart. Conch. Cab. i. t. 2. f. 16 (copy).

$\gamma$ . *Siliquaria anguina*, Sow. Genera (cum juvenili); Chenu, Illustr. pl. 1. f. 1 z, q, v, r, b.

I have not seen any authentic specimen from the Mediterranean of this species. I do not know which name has priority. Schumacher's 'Essai' is dated March 1, 1817, and the first volume of Dillwyn Jan. 1, 1817, but the second volume has no date. I have not referred Montfort's *Siliquarius angustus* to this species, which has a simple slit, while Montfort indicates the following characters:—"Une fente étroite, plus ou moins dentelée, peut-être même dans quelques espèces indiquée par une file sériale de trous. Amboine, d'où viennent ceux que l'on voit dans nos collections."

## 8. TENAGODUS (SILIQUARIUS) TROCHLEARIS, n. sp., Mörch.

*T. trochlearis, tenuiuscula, umbilico angusto pervio; anfr. 6, primis conjunctis, cæteris tangentibus, inferne et superne planatis, transversim dense rugoso-fissuratis, longitudinaliter obsolete striatis et sulcatis, lineis pallide-flavis spiralibus ornatis; apex turbiniformis, fissura nulla. Rima utrinque undulato-dentata, dentibus acutiusculis sæpe tangentibus.*

Long. 23 cm., diam. ap. 6-7 mm.

Tirrebourres, Davila, Cat. i. p. 99, t. 4. f. E, non absimilis.

*Siliquaria anguina*, Chenu, Ill. pl. 1. f. 15 (quoad formam spiræ); Leçons, p. 189, f. 604 (copy).

*T. philippii*, coll. Cumingii, specimen unicum.

The specimen described has not the straight last whorl of the figure above-mentioned.

## 9. TENAGODUS (SILIQUARIUS) ENCAUSTICUS, Mörch.

*T. crassa, rudis, irregulariter contorta; anfr. apicis subdisjunctis, compressis, medio angulatis (casu?), aperturam versus teretibus, transversim profundissime fissis et striatis, regio umbilicalis callo encaustico oblecta. Rima nulla in anfr. primis 3-4, deinde utrinque denticulata, unde poris oblongis et rotundis sæpe confluentibus, aperturam versus simplex.*

Long. 12 cm., diam. ap.  $3\frac{3}{4}$  m.

Hab. Ins. Ceylon (É. L. Layard). Specimen unicum in coll. Cumingii.

The pores perhaps more like those of the preceding group, but the closed spiral slit shows more affinity to this section.

10. TENAGODUS (SILIQUARIUS) INCISUS, (*Helix*) Chemn. 1786.

Var.  $\alpha$ . *Spira superne spiraliter excavata.*

*Helix incisa*, Chemn. Conch. Cab. ix. p. 5, t. 129. f. 1166; Gmel. 3630. no. 238; Dillwyn, 924, p. 85; Wood, Index, t. 34. f. 85 (copy); Pfr. Monogr. Helic. i. p. 426.

Var.  $\beta$ . *Spira superne plana vel convexiuscula.*

*Siliquaria senegalensis*, Recluz.

*Siliquaria anguina*, Chenu, Illustr. pl. 1. f. 1 l, non absimilis.

*T. crassa, spira trochleari; anfr. primi conjuncti padolliformes, pallide carnei, umbilico angustissimo, anfr. superne conferte radiatim unduloso-sulcati, transversim profunde et conferte fissi et striati, spiraliter confertissime et obsolete striati. Rima aperta utrinque leviter undulato-dentata.*

Long.  $12\frac{1}{2}$  cm., diam. apert. 4-5 mm.

Hab. Senegal (coll. cl. Dunkeri).

Var.  $\gamma$ . LINEATA.

*T. caudicans; anfr. inferne lineis spiralibus confertis pallide aurantiis; apice spiræ prominente, albo.*

Hab. Senegal (Bernardi).

Var.  $\delta$ . ROSEA.

*Color saturate roseus, apice testæ albescente, umbilico pervio.*

Long. 15 cm., diam. apert. 6 mm.

*Hab.* Zanzibar (coll. Cuming.).

A specimen in the collection of Chr. VIII., which I suppose is the original specimen of Chemnitz, although it is somewhat smaller than the figure (Diam. maj. 11 mm., min. 10 mm., diam. apert. 4 mm.), offers no important difference from the specimens of *S. senegalensis*, Récluz. The var.  $\delta$  is of a bright rose-colour; but I cannot regard this circumstance as of specific value, although the locality indicated is very different. Var.  $\beta$ , with a pale yellow-red apex, shows a transition in colour.

## 11. TENAGODUS (SILIQARIUS) PONDEROSUS, Mörch.

*T. crassa ponderosa candida trochleatim contorta, umbilico pervio latiusculo; anfr. 3½ (primi desunt) compressiusculi, obtuse angulati, superne planati, radiatim leviter sulcati, spiraliter leviter undulato-striati unde decussati, transversim profunde et conferte fissurati et striati; anfractus ultimus longus rectus subdeclivis, inferne grosse liratus, stratis crassis irregularibus circiter 8 compositus. Rima canaliculata simplex, margine superiore leviter undulato, aperturam versus angulata, in anfr. primis clausa vel omnino oblitterata.*

Long. 44 cm., diam. anfr. ult. 20 m., diam. ap. 10 m.

*Operculum ut id S. australis, var.  $\beta$ , sed ciliis longioribus, anfr. num. 7-8. Diam. 8 mm., alt. 5 mm.*

*Hab.* Port Essington, 7 fathoms, sandy mud (Jukes); col. Cuming. A single specimen, attacked by a burrowing Annelide.

This is one of the newest and largest Univalves.

Subgenus PYXIPOMA, Mörch. ( $\pi\upsilon\chi\iota\sigma$  et  $\rho\acute{o}\mu\alpha$ .)

*Rima hians marginibus utrinque acutis, postice lamina interna clausa sed non repleta. Operculum spirale, margine ciliato, axis dissepimentis simplicibus.*

## 12. TENAGODUS (PYXIPOMA) LACTEUS, Lam.

*T. gracilis nitidiuscula, pellucens, alba, obsolete fuscescens, longitudinaliter limbata, liris inferne prominentioribus, spiram versus evanescentibus; striis incrementi expressis et reflexis, juxta rimam obsoletissime fissuratis. Testa infantilis castanea ampullariformis. Rima hians utrinque acutissima.*

Long. 1½ cm., diam. ap. 3 mm.

*Operculum subcylindricum, gyris circiter 18 confertissimis, ciliis marginalibus validis; axis polythalamius superne mammillatim prominens; area lævigata profunde immersa, peripheria excavata; lamina marginalis convexa, nitida flavescens, linea impressa peripherica notata.*

Diam. 2 mm., alt. 2¼ mm.

*a. crassiuscula, opaca, alba* (coll. Cuming.).

*β. pallidissime rosea.*

*γ. fuscescens, rima utrinque violacea, apice alba* (coll. Dunker.).

Jun. *Siliquaria lactea*, Lam. Hist. v. p. 338. no. 5; Dh. v. p. 585; Blainv. Dict. xlix. p. 213; Chenu, Ill. pl. 2. f. 1.

*Hab.* Mer des Indes, Voy. de Péron (*Lam.*); les mers australes, Pér. et Less. (*Blainv.*); Kangaroo Islands (coll. Cuming, a numerous group, quite filling a sponge). *Var. γ.* Adelaide.

13. TENAGODUS (PYXIPOMA) TAHITENSIS, Mörch.

*T. crassiuscula albescens, ferrugineo-tincta, longitudinaliter expresse lirulata, striis incrementi juxta rimam reflexis regularibus expressis unde interstitiis lirarum cancellatis, aperturam versus juxta rimam obsolete fissurata; rima coarctata, margine dextro incrassato.*

Long. rimæ apertæ 45 mm., diam. anfr. ult. 5 mm.

Tahiti, coll. Cuming., specimen fractum, long. 6 cm.

Differt a præcedente *T.* multo majore, liris fortioribus, interstitiis cancellatis, rima coarctata.

14. TENAGODUS (PYXIPOMA) ANGUILLÆ, Mörch.

*T. gracillima, tenuis, candida, hic illic pallide carnea tincta, longitudinaliter subtilissime lirulata, unde obsolete multiangulata; rima regularis margine sinistro acuto suberecto, in anfr. primis clausa, lamina interna; striis incrementi validis, juxta rimam reflexis.*

Long. 43 mm., diam. 2 mm.

Differt a *S. lactea*, *T.* graciliore crassiore opaca, rima angustiore.

*Hab.* Oc. Atlant. ad ins. Anguillam Antillarum (*Dr. Hornbeck*).

15. TENAGODUS (PYXIPOMA) CYLINDRELLA, Mörch.

*T. elongato-cylindrica, trochlearis; anfr. læves, teretes, medio obtuse angulati, ferruginei et pallidiores, transversim dense fissurati, striis incrementi flexuosis inferne valde reductis; rima angusta in anfr. primis lamina interna clausa; apertura ovalis inferne oblique labiata.*

Long.  $7\frac{1}{2}$  cm., axis 18 mm., diam. testæ 7 mm., alt. ap. 4 mm.

*Hab.* Caput Bonæ Spei?

*Var.* — ? *Vermiculus fissura quadam secundum volutas insignitus*, Lister, Hist. Conch. sect. 3, pl. 548. f. 2 = *Tubulus testaceus solitarius*, &c., Mart. Conch. Cab. i. f. 13 A.

*Cylindrella seminuda*, Adams, gives in miniature an idea of this shell. From some fragments of a *Mytilus (Aulacomya)*, probably *crenatus*, Lam., being among the whorls, I suppose this species is from the Cape of Good Hope. The figure of Martini shows the colour, but the form is too broad.

## SYNOPSIS SPECIERUM.

## TENAGODUS, Guettard.

## Subgenus 1. AGATHIRSES, Montfort.

Sect. *a. Testa affixa.*

1. *T. florina*, Defr. Dict. Sc. xlix. p. 216 ; Chenu, pl. 2. f. 9, fossil.

Sect. *β. Apertura rotunda ; testa libera.*

2. *T. furcellus*, Mont. *S. squamosa*, Lam., fossil.  
 3. *T. striatus*, Defr. Dict. Sc. xlix. p. 214, fossil.  
 4. *T. sulcatus*, Defr. *l. c.* ; Chenu, Ill. t. 2. f. 8.  
 5. *T. multistriatus*, Defr. ; Chenu, t. 2. f. 2.  
 6. *T. oclusus*, Chenu, t. 2. f. 7.

Sect. *γ. Rima brevi, aperta.*

7. *T. dubius*, Defr. ; Chenu, t. 2. f. 4 *a-d.*  
 8. *Lima*, Lam. ; Chenu, t. 2. f. 3.

## Subgenus 2. TENAGODUS, Guettard.

*a. Rima porosa.*

9. *T. anguinus*, L. = *T. muricatus*, Born. Ind. orient.  
 10. *T. ruber*, Schum. Ind. orient.  
 11. *T. gigas*, Lesson, Voy. de la Coq. Moluccas.  
 12. *T. roseus*, Blainv. 1827 ; Chenu, pl. 2. f. 13 ?  
 13. *T. polygona*, Blainv.  
 14. *T. lævigata*, Lam. ; Chenu, pl. 2. f. 11.  
 15. *T. porosa*, Bolt. ; Mart. i. f. 13 C. Var. *præcedentis* ?  
*T. papillosa*, Rees ?

*β. Rima simplice.*

16. *T. squamata*, Blainv. Martinique, Chenu, t. 2. f. 12.

## Subgenus 3. SILIQUARIUS, Montf.

*A. Rima porosa.*

17. *T. cumingii*, Mörch. Ins. Philippin. ; Japan ; Ceylon.  
 18. *T. tostus*, Mörch. Ceylon.  
 19. *T. australis*, Q. et G. Australia.

*B. Rima simplice, apice haliotoideo.*

20. *T. obtusus*, Schum. M. medit.  
 21. *T. trochlearis*, Mörch. Ins. Philippin.  
 22. *T. encausticus*, Mörch. Ceylon.  
 23. *T. incisus*, Chemn. Africa occid.  
 Var. *S. senegalensis*, Récluz.  
 24. *T. ponderosus*, Mörch. Port Essington.  
 25. *Tenagodus*, sp. n. (coll. Bernardi).

## Subgenus 4. PYXIPOMA, Mörch.

26. *T. lacteus*, Lam. Australia.  
 27. *T. tahitensis*, Mörch. Ins. Tahiti.  
 28. *T. anguillæ*, Mörch. Ins. Anguilla Antill.  
 29. *T. cylindrella*, Mörch. Cape of Good Hope?

I am much inclined to regard the subgenera as of generic value.

*Alphabetical List of the Species of the Genus Tenagodus.*

- AMMONOIDES (*Serpula*), Brocchi, Conch. Subapp. 1815, ii. p. 629. t. 15. f. 24. *T. teres polythalamica in spiram planam convoluta. Fossile nel Racentino.* The figure in Bourguell, t. 49. f. 309 sinistr., quoted by Brocchi, is very likely a *Planorbis*. Bronn (*Lethæa*) has shown that this shell is the young of *Siliquaria anguina*.
- ANGUILLÆ, Mörch, n. sp.
- ANGUILUS (*Siliquarius*), Montf. Conch. Syst. 1810, ii. p. 39. f. 38. Is perhaps *S. australis*, Q. & G.
- ANGUINA (*Serpula*), Linn. S. N. ed. 10, 1758, no. 700. *T. tere-tiuscula, fissura longitudinali subarticulata.* Founded on Rumph. t. 41. f. H. The figure of Argenville, t. 29 H, representing *Siphonium nebulosum*, Dillw., is, in the twelfth edition, made to refer to *Serpula arenaria*.
- ANGUINARIUS (*Serpula*), Born. Miswriting in Schum. Essai, p. 262, for *Serpula anguina*.
- ANNULARIS, Dillw. Cat. 1817, ii. p. 1081, no. 29. *Serpula* sub-cylindric, with annular contractions, and an obsolete longitudinal fissure. This name is founded on *Le tire-bourre annulaire* of Favanne, i. p. 662. t. 8. f. G 2, copied from Buonanni, Recr. pl. 1. f. 20 C (= Scilla, xii. f. 3; Mart. t. . f. 16; Karch. pl. 4. f. D; Wood, Index, f. 28). It is not quite evident if Favanne's description is made after the figure alone, or after specimens. It is not unlike *S. anguilus*, Montf.
- ARCHIMEDIS (*Serpula*), König, Descr. des Animaux Foss. de Belgique, pl. 9. f. 6 = *S. anguina*, according to Chenu.
- AUSTRALIS, Q. & G. Voy. de l'Astrol. ii. p. 302, 1833. *T. recta regulariter spirali, subcylindrica, transversim rugosa, longitudinaliter tenuissime sulcata, alba postice rubente.* Long. 4 pouc. 2 lig., diam. 8 lig. Port Western. This species is, according to Dr. Chenu, unique in the collection of the Jardin des Plantes; but the figure in Illustr. Conch. pl. 1. f. 3 (copied from Chenu, Man. p. 322. f. 2310) differs in several respects from the description. It can scarcely be called "régulièrement roulée en hélice, dont les deux avant-derniers tours sont très-rapprochés, sans se toucher cependant, et presque horizontaux;" and p. 303: "Il paraît que c'est avec la partie postérieure du manteau que le *Siliquaire* oblitère sa fissure, toujours ouverte et non ponctue à



- l'endroit où sort constamment la branchie." Although this latter assertion seems to be of a general character, without reference to the species, it must be observed that the figure of Chenu shows a porous slit. The measure given seems to me to correspond well with the figure.
- CLAIRBONENSIS, Lea, Contrib. to Geology, 1833, pl. 1. f. 1; Chenu, 2. f. 15. Very like *S. vitis*, Morton.
- COSTÆ, Cantr. Bull. Acad. Bruxelles, 1836, no. 3. p. 21. A small species from the Mediterranean, not described, in the collection of M. O. Costa at Naples.
- CRISTATA, Könighaus, Bronn's Jahrbuch f. Mineralog. 1831, p. 139. A fossil species from Touraine without description.
- CUMINGII, Mörch., ex ins. Philippin.
- CYLINDRELLA, Mörch, n. sp.
- DUBIA, Defr., Chenu, Ill. pl. 2. f. 4 a. Fossil from Grignon.
- ECHINATA, Anton, Verz. 1838. Fossil from Paris.
- ENCAUSTICUS, Mörch, n. sp.
- FLORINA, Defr. Dict. Sc. 1827, t. 49. p. 216; Chenu, Ill. t. 2. f. 9 a-c, original specimens. Is the only affixed species of the genus, perhaps the type of a new genus.
- FURCELLUS (*Agathirses*), Montf. Conch. Syst. 1808, p. 398. Fossil from Grignon.
- GIGAS, Lesson, 1830, Voyage de la Coquille, p. 409. Moluccas. According to the expression "carène garnie de lamelles spinescentes," must be a *Tenagodus*.
- GLABRA, Risso, 1826, Hist. iv. p. 115. *T. tenuissima, glaberrima, pellucida, fragilis, sulcis et lineis longitudinalibus aequalibus exiguissimis sculpta; epidermide succinea*. Lg. 0.086. Régions coralligènes profondes. = *S. costæ*, Cantr. ?
- GRANTII, Sow. Geol. Trans. v. p. 327. t. 25. f. 2 c. Fossil.
- INCISA (*Helix*), Chem. 1786, ix. p. 129. f. 1116. *T. depressa umbilicata alba, margine inciso et quasi dissecto, apertura rotunda* (Wood, Index, copied) = *S. senegalensis*, Récluz, young.
- LACTEA, Lam. Hist. 1818, p. 338. no. 5; Chenu, Ill. (*Pyxipoma*).
- LÆVIGATA, Lam. ib. p. 338, *T. tereti obsolete costata, laxè convoluta; rima articulata*. *T. blanchâtre*, Mont. f. 13 C?; Blainv. Dict. t. 79. p. 213; Chenu, Ill. 2. f. 11; Coll. Mus. f. 11 b, from the coll. Delessert, is perhaps *S. rosea*, Blainv. It is doubtful to me if it is a *Tenagodus* or *Siliquarius*.
- LÆVIS (*Vermetus*), Bellardi, Foss. Num. de Nice, 1852, p. 228. t. 15. f. 4. *T. laxè contorta, cylindrica, lævis*. This species belongs perhaps to *Siliquaria*.
- LIMA, Lam. Hist. v. 1818, p. 338. no. 6. *T. tereti, per longitudinem multistriata, laxè contorta; striis squamulis asperatis*.

- Grignon. Chenu, Ill. t. 2. f. 3; Dh. *Traité*, pl. 71. f. 5-7 (*Agathirsés*).
- MULTISTRIATA, Defr. Chenu, Ill. p. 3. pl. 2. f. 2 (coll. Defr.). Fossile de Marquemont.
- MURICATA (*Serpula*), Born, Test. 1780, p. 440. t. 18. f. 16 (*Tenagodus*). Is very likely the full-grown *T. anguinus*, L., Rumph. 41 H.
- OBTUSA (*Anguinaria*), Schum. Essai, 1817, p. 262. Founded on *Serpula anguina*, Born, p. 440. t. 18. f. 15.
- OCCLUSA, Anton, Verz. 1838, p. 55. no. 1980. Fossil from Paris.
- ORNATA, Mus. Univ. Hafn. 24<sup>te</sup> Versammlung deutscher Naturforscher, p. 118. no. 15, 1847. Fossil from the chalk of Taxoe.
- PAPILLOSA, Rees, Encycl., gen. *Serpula*, teste Chenu, Ill. pl. 2. f. 16 (copied from Humphrey's Conchology, pl. 11. f. 3). Very likely *S. porosa*, Bolten.
- POLYGONA, Blainv. Dict. 1827, xlix. p. 213. From the coll. of the Prince of Essling! according to Blainville, contrary to the assertion of Dr. Chenu. Ill. Conch. pl. 2. f. 6 is a copy of Humphrey, pl. 11. f. 2.
- PONDEROSUS, Mörch, n. sp.
- POROSUS, Bolten (*Serpula*), Verz. 1795, pp. 49, 892; Martini, i. f. 13 c, p. 50, is the type; perhaps a *Siliquarius*.
- ROSEA, Blainv. 1827, Dict. Sc. Nat. t. 49. p. 214; Chenu, pl. 2. f. 13.
- ROSEA, Gray, Fig. of Moll. iv. p. 83; Guide, p. 128, is a *Fermetus*. *Stephopoma rosea*, Quoy & Gaim.
- RUBRA (*Anguinaria*), Schum. Essai, 1817, p. 262: "Cette coquille est sillonnée très-profondement dans sa longueur, et la couleur en est rouge tirant sur le violet." Mart. f. 13, 14 (13 b, a species unknown to me; 13 c, *S. porosa*, Bolt.).
- SENEGALENSIS, Récluz (ubi?); coll. Dunker et Bernardi.
- SPINOSA, Lam. v. 1818, p. 338; Faujas, Géol. t. 3. f. 6. Grignon. = *Agathirsés furcellus*, Montf.
- SPIRALIS, Risso, 1826, Hlist. p. 115. no. 277. *T. rugosa*, *crassa*, *transverse striata*, *anfractibus inferioribus approximatis*, *spiram conicam efformans*, *epidermide griseo-fusca*. = *S. anguinus*, Philippi?
- SQUAMATA, Blainv. Dict. Sc. t. 49. p. 213; Chenu, Ill. p. 3. pl. 2. f. 12; Id. Manuel, p. 322. f. 2309 (copy). *Rima inarticulata*.
- STRIATA, Defr. Dict. Sc. t. 49. p. 214; Chenu, pl. 2. f. 10. Fossil.
- SULCATA, Defr., Chenu, Ill. p. 4. pl. 2. f. 8 a, b. Fossil.
- SULCATA, Gray, 1847, List of Genera, P. Z. S. 1847, no. 261. = *Anguinaria*,  $\beta$ , Schum. = *S. rubra*, Schum.
- TAHITENSIS, Mörch, n. sp.

TEREBELLA, Lam. v. 1818, p. 338. no. 4. Fossil from St. Clément de la Placis. *S. anguina*, var., Chenu, pl. 1. f. 1 g-l.

TOSTUS, Mörch, n. sp.

TUBERCULATA, Anton, 1838, Verz. p. 55. Fossil from Paris.

VARIEGATA (*Serpula*), Perry, 1811, Conchology, pl. 53. f. 14. West Indies. Very likely a bad imitation of a *Siliquarius*.

VITIS, Conrad, 1832, Fossil Shells of the Tertiary formation of N. America, i. t. 17. f. 2 = *S. clairbonensis*, Lea, teste Conrad.

VOLVOX (*Serpula*), Dillwyn, 1817, p. 1079. no. 26. Founded on Rumph. pl. 41. f. H. *Tenagodus anguinus*, L.

The following list of additions made to the Menagerie by gift, purchase, and exchange, during the months of July, August, September, and October, was read:—

## JULY.

		Presented by
A pair of Zebus .....	<i>Bos zebu</i> , var. ....	Baron Jackman.
1 Vulpine Opossum .....	<i>Phalangista vulpina</i> .....	R. Nunn, Esq.
1 Common Tortoise .....	<i>Testudo græca</i> .....	Mrs. Robinson.
1 Thick-tailed Opossum ...	<i>Didelphis crassicaudata</i> .....	His Exc. W. D. Christie.
2 Egyptian Foxes .....	<i>Canis niloticus</i> ? .....	J. A. Olding, Esq.
2 Troupials .....	<i>Icterus jamacaii</i> .....	F. Bernal, Esq., H.B.M. Consul at Carthage.
1 Great Sulphur-crested Cockatoo.	<i>Cacatua galerita</i> .....	Richard Tress, Esq., F.Z.S.
3 Tortoises .....	<i>Testudo</i> — ? .....	A. Kelly, Esq.
1 Common Weazel .....	<i>Mustela vulgaris</i> .....	E. D. Hewkes, Esq.
1 Antiguan Iguana .....	<i>Iguana nudicollis</i> .....	Capt. Abbott.
2 Japanese Deer .....	<i>Cervus sika</i> ? .....	I. Wilks, Esq.
2 Chinese Pheasants .....	<i>Phasianus torquatus</i> .....	Capt. Rees.
2 Turkey Buzzards .....	<i>Cathartes atratus</i> .....	Dr. Holbeck, Charleston, U.S.A.
1 Diana Monkey .....	<i>Cercopithecus diana</i> ...	I. Mann, Esq.
1 Billardier's Wallaby .....	<i>Halmaturus billardieri</i> ..	John Salmon, Esq.
2 Peregrine Falcons .....	<i>Falco peregrinus</i> .....	H. Footner, Esq.
2 Nightjars .....	<i>Caprimulgus europæus</i> ..	R. W. Archibald, Esq., 58th Regiment.
5 Water Tortoises .....	<i>Emys</i> — ? .....	Dr. Holbeck, Charleston, U.S.A.
4 Land Tortoises .....	<i>Cistudo clausa</i> .....	
2 Serpents from Natal ...	{ <i>Clotho arietans</i> .....	
	{ <i>Causus rhombeatus</i> .....	
5 Falkland Island Geese ...	<i>Chloëphaga rubidiceps</i> , sp. nov.	
1 Eyra Cat .....	<i>Felis eyra</i> .....	
1 Whimbrel .....	<i>Numenius phæopus</i> .....	
2 Kentish Plovers .....	<i>Egialites cantianus</i> .....	
4 Sonnerat's Jungle Fowls.	<i>Gallus sonneratii</i> .....	Purchased.
1 Dorcas Gazelle .....	<i>Gazella dorcas</i> .....	
1 Spotted Dasyure .....	<i>Dasyurus maculatus</i> ..	
1 Amazonian Parrot .....	<i>Chrysotis</i> — ? .....	
1 Tawny Eagle .....	<i>Aquila naevioides</i> .....	
6 Ruffs .....	<i>Machetes pugnax</i> .....	
1 Necklaced Pigeon .....	<i>Columba speciosa</i> .....	

Of these, *Didelphis crassicaudata*, *Causus rhombeatus*, and *Chloëphaga rubidiceps* were stated to be exhibited for the first time.

## AUGUST.

		Presented by
1 Bonelli's Eagle .....	<i>Aquila bonellii</i> .....	} His Majesty the King of Portugal.
2 Imperial Eagles .....	<i>Aquila imperialis</i> .....	
1 Common Kite .....	<i>Milvus regalis</i> .....	M. H. Pierre Pichot.
6 Barbary Mice.....	<i>Mus barbarus</i> .....	
3 Slow Worms .....	<i>Anguis fragilis</i> .....	R. H. Holman, Esq.
1 Ocelot (from Carthagena)	<i>Felis pardalis</i> (?).....	D. A. C. Festing, Esq.
1 Ring Parakeet .....	<i>Palæornis</i> .....	Mr. Strutt.
1 Common Buzzard .....	<i>Buteo vulgaris</i> .....	J. Gurney Barclay, Esq.
2 Sparrow Hawks .....	<i>Accipiter nisus</i> .....	R. W. Archibald, Esq.
1 Ichneumon .....	<i>Herpestes griseus</i> .....	Percy Dodgson, Esq., 14th Light Dragoons.
1 Chameleon.....	<i>Chamæleo africanus</i> ..	A. Crosbie, Esq.
2 White Guinea Fowls .....	<i>Numida meleagris</i> .....	Right Hon. The Speaker, F.Z.S.
1 Toco Toucan .....	<i>Ramphastos toco</i> .....	The Viscount Powerscourt.
1 Capuchin Monkey .....	<i>Cebus apella</i> .....	Archibald Weir, Esq.
3 Indigo Birds .....	<i>Spiza cyanea</i> .....	G. Johnson, Esq., F.Z.S.
1 Rhesus Monkey.....	<i>Macacus rhesus</i> .....	Mr. Morris.
1 Passenger Pigeon .....	<i>Ectopistes migratoria</i> ..	} Purchased.
2 Indian Ichneumons .....	<i>Herpestes nepalensis</i> ..	
4 Black-tailed Godwits.....	<i>Limosa melanura</i> .....	
3 Ruffs .....	<i>Machetes pugnax</i> .....	
3 Magellanic Geese .....	<i>Chloëphaga magellanica</i> ..	
1 Capuchin Monkey .....	<i>Cebus apella</i> .....	
1 Rhesus Monkey.....	<i>Macacus rhesus</i> .....	
1 Red Ground Dove.....	<i>Geotrygon montana</i> .....	
2 Mountain-witch Doves ...	<i>Geotrygon sylvatica</i> ..	
2 Stinging Weavers .....	<i>Trachinus vipera</i> .....	
2 Seals .....	<i>Phoca vitulina</i> .....	
1 Moor Macaque .....	<i>Macacus maurus</i> .....	
1 Long-tailed Flying Opossum.	<i>Belideus flaviventris</i> ..	

Of these, *Herpestes nepalensis* and *Macacus maurus* were stated to be exhibited for the first time.

## SEPTEMBER.

		Presented by
1 Bonelli's Eagle .....	<i>Aquila bonellii</i> .....	Baron I. I. de Forester.
1 Musquash.....	<i>Fiber zibethicus</i> .....	Lieut. T. H. Archer.
1 Indian Paradoxure .....	<i>Paradoxurus typus</i> ..	E. Lowry, Esq.
4 Chameleons .....	<i>Chamæleo vulgaris</i> .....	H. Longman, jun., Esq.
1 Boa .....	<i>Boa constrictor</i> .....	Capt. Selby.
2 Moscow Rabbits .....	<i>Lepus cuniculus</i> , var. ...	C. Darwin, Esq., F.Z.S.
2 Green Parrots .....	<i>Chrysotis</i> .....	Miss Robinson.
1 Paradoxure .....	<i>Paradoxurus aureus</i> ..	S. G. Rawlins, Esq.
2 Black Swans .....	<i>Cygnus atratus</i> .....	Dr. Mueller of Melbourne.
1 Rhesus Monkey .....	<i>Macacus erythræus</i> .....	Burnet Tabrum, Esq.
1 Water Tortoise.....	<i>Emys</i> , sp. (?) .....	Mrs. Lühmenant.
2 Honey Buzzards .....	<i>Pernis apivorus</i> .....	C. Clifton, Esq., F.Z.S.
1 Wood-Pigeon .....	<i>Columba palumbus</i> .....	C. Clifton, Esq., F.Z.S.
1 Entellus Monkey .....	<i>Cercopithecus entellus</i> ..	G. Gray, Esq.
1 White-nosed Monkey ...	<i>Cercopithecus peltaurista</i>	B. Durrant, Esq.
1 Wauderose Monkey .....	<i>Macacus silenus</i> .....	Capt. Reader, 12th Lancers

## SEPTEMBER (continued).

1 Peccary.....	<i>Dicotyles torquatus</i> .....	A. Arcedeckne, Esq., F.Z.S.
1 White-headed Pigeon ...	<i>Columba leucocephala</i> .....	T. O'Connor Morris, Esq.
10 St. Thomas Lizards.....	<i>Anolis</i> — ? .....	Capt. Sawyer.
3 Passerine Ground Doves	<i>Chamaepelia passerina</i> .....	Sir Charles C. Smith, Bart.
1 South American Rat Snake.	<i>Spilotes variabilis</i> .....	} Dr. Wucherer of Bahia.
1 Green Snake .....	<i>Philodryas viridissimus</i> .	
12 Water Tortoises .....	<i>Emys</i> — ? .....	} Purchased.
1 Nilotic Monitor .....	<i>Monitor niloticus</i> .....	
4 Mocking Birds.....	<i>Mimus polyglottus</i> .....	
1 Black African Kite .....	<i>Milvus parasiticus</i> .....	
1 Lory .....	<i>Trichoglossus ornatus</i> .....	
2 Quaker Parrakeets .....	<i>Conurus murinus</i> .....	

Of these, *Spilotes variabilis* was stated to be exhibited for the first time.

## OCTOBER.

		Presented by
A Spotted Hyæna.....	<i>Hyæna crocuta</i> .....	} E. Gabriel, Esq., H. B. M. Commissioner at Lo- anda, Angola.
An African Civet .....	<i>Viverra civetta</i> .....	
An African Goat .....	<i>Capra hircus</i> , var.	
A Marabou .....	<i>Leptoptilus crumeniferus</i>	
A Philantomba Antelope ...	<i>Cephalophus monticola</i> ?	} I. Malcolm Wingfield, Esq.
A Duyker Bok .....	<i>Cephalophus burchellii</i> ..	
A Crested Eagle .....	<i>Spizaetus occipitalis</i> ..	} Capt. Herd.
An American Black Bear...	<i>Ursus americanus</i> .....	
An American Eagle .....	<i>Aquila canadensis</i> ? .....	} Capt. Herd.
2 Fisher Martins .....	<i>Mustela canadensis</i> .....	
A Red Tinamou .....	<i>Tinamus</i> — ? .....	} Mrs. Christie.
2 Buzzards.....	<i>Buteo vulgaris</i> .....	
A Snowy Owl .....	<i>Nyctea nivea</i> .....	} Mrs. Belgrave.
2 Javan Paradoxures .....	<i>Paradoxurus musanga</i> ..	
A Stanley Crane .....	<i>Grus paradisca</i> .....	} George Clive, Esq.
2 Indian Geckos .....	<i>Gecco verus</i> .....	
An Alexandrine Parrakeet..	<i>Palæornis alexandri</i> ..	} Charles Martin, Esq.
A Brahmin Bull .....	<i>Bos zebu</i> , var. ....	
A Tawny Eagle .....	<i>Aquila naevioides</i> .....	} Capt. Taylor.
An African Buzzard .....	<i>Buteo tachardus</i> .....	
2 Indian Green Snakes.....	<i>Dryophis prasina</i> .....	} E. Blyth, Esq.
A Glaucous Gull .....	<i>Larus glaucus</i> .....	
1 Kangaroo Rat .....	<i>Bettongia ogilbii</i> ? .....	} Robert Scott, Esq.
2 Wagtails.....	<i>Motacilla yarrellii</i> .....	
2 Rock Pippits .....	<i>Anthus aquaticus</i> .....	} — Fitz Gerald, Esq.
3 Tree Sparrows .....	<i>Passer montanus</i> .....	
1 Jungle Fowl .....	<i>Gallus furcatus</i> .....	} E. L. Layard, Esq., F.Z.S.
		} Purchased.
		} Received in exchange.

Of these, *Spizaetus occipitalis* was stated to be exhibited for the first time.

November 27th, 1860.

Dr. J. E. Gray, V.P., in the Chair.

Mr. Selater exhibited some bird-skins, procured by Capt. Herd at Port Churchill, Hudson's Bay. Amongst them was a Crane, similar to *Grus canadensis*, but much smaller in dimensions, and probably referable to the species described by Mr. Cassin as *Grus fraterculus* (Birds of N. Am. p. 656) from an immature example obtained in New Mexico. It was of interest as being the second specimen obtained, and the first in adult plumage, of this species. Another skin was probably that of *Bernicla hutchinsii*, though rather larger in dimensions than the described individuals of this species. Capt. Herd had likewise presented a living pair of this dwarf variety of the Canada Goose (*Bernicla canadensis*) to the Society's Menagerie—which was the first occasion of their having been exhibited alive in this country.

Mr. Gould brought under the notice of the meeting several Crested Penguins, and remarked that there appeared to be some species of this truly oceanic group which had not yet been characterized. Upon the present occasion, however, he only referred to those forming the genus *Eudyptes*, and, after a few cursory observations upon the described species of that form, proceeded to characterize two others from his own collection under the names of *Eudyptes nigrivestis* and *E. diadematus*.

Mr. Gould remarked that the species of this well-defined crested group now known were:—

<i>Eudyptes chrysolophus</i> .	<i>Eudyptes nigrivestis</i> .
— <i>chrysocome</i> .	— <i>diadematus</i> .
— <i>pachyrhynchus</i> .	

The following were the descriptions given of the two new species:—

**EUDYPTES NIGRIVESTIS, Gould.**

Face, chin, upper part of the throat, and sides of the neck black; feathers of the forehead and crown long, narrow, and silky-black; those on the sides of the head considerably prolonged; a stripe of pale straw-yellow commences at the nostrils, continues over the eye, and extends in lengthened narrow filamentous feathers behind that organ; upper surface black, each feather with a narrow line of greyish-blue at the tip; outer side of the wing shining black, edged posteriorly with white; tail black with grey reflexions; all the under surface of the body and the under surface of the wing, except at the base and tip, silky-white, the base and tip being sooty-black; bill chestnut-brown; eye pinkish-chocolate; feet livid.

Total length  $21\frac{1}{2}$  inches, bill 2, wing  $5\frac{3}{4}$ , tail 4, tarsi  $\frac{7}{8}$ .

*Habitat.* The Falkland Islands, where it is known by the name of "Rock-hopper."





J. Jury Lith.

M. S. N. Hancock Lith.

MACACUS OCREATUS.



*Remark.* The species to which this bird is most nearly allied appears to be *E. chrysocome*; but it differs in being of a smaller size, in its much darker colouring, particularly of the throat, sides of the face, and wings; the superciliary stripe and the filamentous feathers into which it is prolonged are also much less developed.

#### EUDYPTES DIADEMATUS, Gould.

Face, chin, upper part of the throat, and sides of the neck sooty-black; feathers of the forehead and crown long, narrow, and silky-yellow at the base, and silky-black for the remainder of their length, those on the sides of the head considerably prolonged; a stripe of chrome-yellow commences at the nostrils, continues over the eye, and extends in lengthened narrow filamentous feathers behind that organ; upper surface black, each feather with a narrow line of greyish-blue at the tip; outer side of the wing dark-grey, edged posteriorly with white; tail black with grey reflexions; under surface of the body and the under side of the wing, except at the base and tip, silky-white, the base and tip being sooty-black; bill chestnut-brown; eye pinkish-chocolate; feet livid.

Total length 25 inches, bill  $2\frac{3}{4}$ , wing 6, tail  $4\frac{1}{2}$ , tarsi  $1\frac{1}{4}$ .

*Habitat.* The Falkland Islands.

*Remark.* This is a somewhat large species, and bears the same relationship to *E. chrysolophus*, that *E. nigrivestis* does to *E. chrysocome*; it differs, however, from *E. chrysolophus* in the darker colouring of its chin and the presence of the rich chrome-yellow stripe which passes over the eye. It differs also from *E. pachyrhynchus* in the more lengthened and less robust form of the bill.

For both these new species, science is indebted to Captain Abbott.

The following papers were read:—

1. NOTICE OF SOME RARE SPECIES OF QUADRUMANA, NOW LIVING IN THE SOCIETY'S MENAGERIE. BY PHILIP LUTLEY SCLATER, M.A., SECRETARY TO THE SOCIETY.

(Mammalia, Pl. LXXXII.)

The Society's collection of living *Quadrumana*, though not large at the present moment (embracing about sixty individuals, belonging to twenty-six species), contains examples of several rare and little-known animals of this order, concerning which I beg leave to be allowed to make a few remarks. The difficulty of accurately describing living animals, particularly of this kind, is so well known, that I shall make no apology for confining my observations to the general characters by which I hope to make the species more easily recognizable, trusting that, as when dead they will be offered to the British Museum, there will be better opportunity of examining them more fully hereafter.

1. *MACACUS OCREATUS*. (The Ashy-black Macaque.) (Pl. LXXXII.)

*Papio ocreatus*, Ogilby, P. Z. S. 1840, p. 56; Ann. N. II. vi. 517.  
*Macacus fusco-ater*, Schinz, Syn. Mamm. p. 58; Wagn. Säug. v. p. 59.

We have a male Macaque, obtained by exchange out of a travelling menagerie in the summer of 1858. It was somewhat paralysed in the hind-quarters when received, and does not promise to be very long-lived. The species seems certainly the same as that described by Mr. Ogilby before the Society in 1840 from a specimen observed living in a menagerie, and is probably identical with *Macacus fusco-ater* of Schinz, in which case, however, Mr. Ogilby's name has precedence. It belongs strictly to the division of *Macacus* in which the tail is very short, sometimes reduced almost to a tubercle as in *M. arctoides*\* and *M. maurus*. There is no example of this species in the British or French National Collections; but the Leyden Museum contains two specimens (labelled, if I recollect right, *maurus*), which, I believe, belong to it. The example in the Frankfort collection (Schinz's type) is said to have been brought from Celebes. Wagner's diagnosis, slightly altered, "*Niger, artubus intus antè brachiis tibiisque cinereis, cauda brevissima,*" suits our specimen very well, and is quite sufficient to distinguish the present species from its allies.

2. *MACACUS MAURUS*. (The Moor Macaque.)

A young male Macaque, lately purchased from a dealer, seems to belong to this species as figured by F. Cuvier†. It belongs strictly to the same group of *Macacus* as the last species, having the tail reduced to a mere naked tubercle, hardly an inch in length. The hair is of a uniform brown without annellations, and the naked face black. Two examples of the same animal, rather lighter in colouring, are in the British Museum, lately acquired at the sale of Lidth de Jeude's collection. The locality of this Macaque is not accurately known‡; but the occurrence of this example is interesting as tending to confirm the species, which the French authorities themselves have characterized as "*une espèce très-douteuse*§." It appears to be decidedly different from *Macacus arctoides* of Cochin China.

3. *CERCOPITHECUS RUFO-VIRIDIS*. (The Rufous-backed Monkey.)

\* It may be remarked that *Papio melanotis*, Ogilby (of which the type is now in the British Museum), is certainly not *Macacus speciosus*, as attempted to be shown by Wagner, but more nearly resembles *M. arctoides*, having a very short tubercle for a tail. In *M. speciosus* of Japan the tail is considerably longer and covered with hair.

† F. Cuvier and St. Hil. Mamm. livr. 4.

‡ Mr. Bartlett informs me that there are two Monkeys of the same species, only rather larger, and darker in colouring, alive in the Zoological Gardens at Amsterdam.

§ I. G. St. Hilaire in Cat. Mamm. Mus. Paris, p. 31.

*Cercopithecus rufo-viridis*, I. Geoffr. St. Hilaire, Compt. Rend. xv. p. 1038; Arch. Mus. ii. p. 564. pl. 4.

In June 1859 we received a Monkey, obtained, living, by Commander Beddingfield, R.N., in the mouth of the Zambesi River when in company with Dr. Livingstone's expedition. It agrees so nearly with the description and figure of M. St. Hilaire's *Cercopithecus rufo-viridis*, that I have no doubt of its belonging to that species. The feet of our specimen are rather darker-grey in colouring, which is really almost the only difference I can make out. As the typical example of this species at Paris was the only one previously known, it is of much interest to possess a second, coming from a determinate locality. Referring to Dr. Peters's 'Zoology of the Mozambique,' we find no species indicated as likely to be intended for the present, though the true *C. pygerythrus* (a species generally confounded with the South African *C. delalandii*) is said to occur in that country. The nearest ally of *C. rufo-viridis* is the Grivet (*C. griseo-viridis*, Desm.) of Eastern Africa.

#### 4. CYNOCEPHALUS ANUBIS, F. Cuv. & St. Hil.

The Society have lately purchased of Mr. W. C. Finlason a fine young male example of a *Cynocephalus*, which that gentleman brought home with him from Lagos in the Bight of Benin, on the west coast of Africa. It was captured when quite young, about midway between Lagos and Abbeokuta.

Mr. Finlason informs me that it is very seldom that these animals can be obtained, the natives having a fearful horror of their strength and ferocity when attacked.

This *Cynocephalus* seems to be the *Anubis*, as figured in F. Cuvier and G. St. Hilaire's 'Mammifères' (livr. 50), a species not generally recognized by systematists. It agrees perfectly with the example lately in the Society's collection, but now in the British Museum, which was named *Cynocephalus anubis* by Mr. Waterhouse\*, and with other similar specimens, which all bear the same name, in our National Collection. It is very different from *Cynocephalus babuin* of Eastern Africa, of which Wagner† has made the *C. anubis* a variety, and is more like *C. sphinx* of Senegal. The *Cynocephalus olivaceus* of Geoffroy St. Hilaire's Catalogue of the French National Collections is undoubtedly of this same species, our specimens agreeing perfectly with the characters there given, and being from the same locality. The most noticeable points in this *Cynocephalus* are the very elongated black face, and the uniform dark olive-green fur, traversed below the surface with annellations of yellow and black.

I may take this opportunity of remarking that Mr. Ogilby's *Cynocephalus thoth*‡, of which the type specimen is now also in the

\* See 'Catalogue of the Mammalia preserved in the Museum of the Zoological Society of London,' ed. 2, 1838, p. 8, sp. 51 A.

† Schreber's Säug. Suppl. v. p. 63.

‡ P. Z. S. 1843, p. 11; Fraser's Zool. Typ. pl. 5.

British Museum, has nothing to do with *C. hamadryas*, as supposed by Wagner in the work above referred to\*, but is most closely allied to *C. babuin*.

It may be of interest to add a complete list of the species at the present moment in the Menagerie, although in this group of animals deaths and fresh accessions are so frequent that the names are liable to perpetual change.

1. *Presbytes entellus*, India.
2. *Cercopithecus petaurista*, W. Africa.
3. — *mona*, W. Africa.
4. — *diana*, W. Africa.
5. — *delalandii*, S. Africa.
6. — *subæus*, W. Africa.
7. — *rufo-viridis*, Zambesi.
8. — *griseo-viridis*, E. Africa.
9. *Cercocebus fuliginosus*, W. Africa.
10. *Macacus radiatus*, Continental India.
11. — *pileatus*, Ceylon.
12. — *cynomolgus*, Malay countries.
13. — *silenus*, Malabar Coast.
14. — *rhesus*, India.
15. — *nemestrinus*, Malay countries.
16. — *ocreatus*, Celebes (?).
17. — *maurus*.
18. *Cynocephalus hamadryas*, Aden.
19. — *anubis*, W. Africa.
20. *Cebus apella*, S. America.
21. — *cirrifer*, S. America.
22. — *capucinus*, S. America.
23. *Ateles pentadactylus*, S. America †.
24. *Lemur nigrifrons*, Madagascar.
25. — *albimanus*, Madagascar.
26. — *hybridus*, ex *L. nigrifronte*, ♂, et *L. albifronte*, ♀.

The following species have within the last few years bred in our menagerie:—*Macacus pileatus*, *M. rhesus*, *Cercocebus fuliginosus*, and hybrids between *M. pileatus* and *M. radiatus*, between *M. cynomolgus* and *M. nemestrinus*, and between *Lemur nigrifrons* and *L. albifrons*.

## 2. ON THE GENUS HYPEROODON: THE TWO BRITISH KINDS, AND THEIR FOOD. BY DR. J. E. GRAY, F.R.S., V.P.Z.S., ETC.

At the preceding meeting of the Society, a letter was read from the Rev. G. Beardsworth, the Vicar of Selling, on a female Whale and

\* Schreber's Säug. Suppl. v. p. 63.

† Our *Ateles* has one hand with the thumb, and one without it, and is thus intermediate between *A. pentadactylus* and *A. paniscus*. But the face is black.

its young, which had been caught on the coast near Whitstable, Kent\*.

Through the kind agency of Mr. Beardsworth, the complete skeleton of the older, and part of the skeleton of the younger specimen have been secured for the British Museum. The species is *Hyperoodon rostratum*. It is well figured, from a drawing by Mr. Beardsworth, in the 'Illustrated News' for the 18th of November, 1860.

There has been some discussion about the form of the blow-hole in this genus,—some, as Voigt and Wesmael, describing the ends of the opening as pointed forwards, as in other Dolphins, while Dale, Boussard and Doumel describe them as pointed backwards. Mr. Beardsworth, in his description, calls the blow-hole straight; but his figure represents it as slightly crescent-shaped, with the ends pointing towards the nose; and Mr. Crotch, who has sent me a note on a specimen of a female *Hyperoodon* which was shot near Weston-super-Mare, as exactly agreeing with the specimen obtained at Kiel in 1801, only that the cusps of the blow-hole are directed forwards; and he inquires, "Does the cusp of the lunate spiracle turned forward mean anything?" At any rate it appears to be the normal direction in this species.

Mr. Beardsworth observes in his note:—"I enclose you a portion of the food found in the stomach. There was more than half a bushel of this (which I am told is the claws of the Cuttle-fish), and nothing else."

It is not a new fact that Cetaceans, at least the Whales with teeth, feed on these animals; for the beaks of some Cephalopods are found interspersed in the substance of ambergris, which is a concretion found in the intestines or stomach of the Spermaceti Whale. In this substance they are in general few in number; but their presence is so universal that the druggists do not consider the ambergris true if they are not found in it, and they thus distinguish the artificial substitute from the real article in the market.

The Black Fish (*Globiocephalus macrorhynchus*) is said to have the remains of Cuttle-fish in the stomach; and Bennett, in his 'Whaling Voyage,' states, "the ordinary food of the Sperm Whale is the Cuttle-fish or Squad, *Sepia*" (p. 176). I suspect that Cuttle-fish or Squad, or even *Sepia*, is intended to represent the Linnæan genus *Sepia*, not the genus as now restricted, and is synonymous with the class *Cephalopoda*: at least that must be the case in the whale now under consideration; for if the beaks belonged to Decapodous Cephalopods either of the genus *Loligo* or *Sepia*, there would no doubt be some remains of the dorsal shell of the *Sepia*, or of the dorsal glade of the *Loligo* and its allied genera, found intermixed with the beaks.

The articles sent were certainly the horny beaks of a Cephalopod, and appear to be those of the common *Octopus*, or Sea Spider.

\* The person who procured the Whale is Mr. Smith. As his card shows a trade in an article that is new to me, I give it entire:—"Henry Smith, Horse Bridge, Whitstable, Fish Agent for Five-fingers, Mussels, and Sprats." I suppose the first are Star-fishes.

It is very curious that these beaks should form such a mass, as this indicates that they must be very abundant in some parts of the sea, and proves that they must form at least a large portion of the food of this animal. I have never seen the *Octopus* in large numbers either at sea, in the nets of the fishermen, or thrown up on the coast; yet that they are abundant somewhere these beaks are a sufficient proof.

The beaks sent me by Mr. Beardsworth all appear to belong to a single species; but he informs me there were some of a larger size intermixed with them when they were first taken out of the stomach, but they were selected and taken away by the bystanders. As there are only an upper and a lower beak to each fish, and they are of a small size, it would require many thousand animals to make up a half-bushel of them.

The measurement of the younger Cetacean, as given by Mr. Beardsworth's account, is interesting as showing its large size while yet in company with its mother, and proving that Dr. Knox's observation, that the fœtus of the Porpoise is half the length (that is one-fourth of the size) of the parent before it is born, and that the young appear to attain their full size very rapidly, is probably equally true in the genus *Hyperoodon*.

It is to be observed that both the female from Whitstable and the female from Weston-super-Mare have the dorsal fin on the hinder part of the back, about two-thirds the distance from the head, as in Hunter's figure of the Bottle-nose (Phil. Trans. vol. lxxvii. t. 19), and not in the middle of the back, as in the Bottle-head or Flounder's-head described and figured by Dale in his History of Harwich, p. 411. t. 149.

In my Monograph on Whales, published in the 'Zoology of the Erebus and Terror,' I described and figured a species of *Hyperoodon* from the skull of an animal which had been caught at the Orkneys, under the name of *Hyperoodon latifrons*, on account of the great height and very great thickness of the reflexed part of the maxillary bones, which form the crest in front of the blowers.

Professor Eschricht considers that this species is founded on the skull of an adult male of the common species (which he calls *Hyperoodon butzkopf*), because the specimen of the animal with this kind of skull which he received from Faroe was of that sex.

The following facts I think will dispel such an idea:—first, I think I can prove that males and females have been seen and preserved of both species; and secondly, the structure and form of the two skulls is so different, that it is much more likely that they should be referable to two very distinct genera than to species of the same genus.

I may state that I have examined four skulls of the *H. latifrons*, and Professor Eschricht has another.

There is a skeleton with the skull of an adult animal of this species in the College Museum at Edinburgh, which was obtained from the Frith of Forth on the 29th of October, 1839. Mr. William Thompson (Ann. and Mag. Nat. Hist. 1846, vol. xvii. p. 153) informs us that this specimen was a female 28½ feet long, accompanied by a young

male. So there can be little doubt that there are females of *Hyperoodon latifrons* as well as males.

It appears to be a northern species. As I have seen specimens from Greenland, the Orkneys, and the Coast of Lanarkshire, this is the most southern example that has yet occurred to me. It is also probably a much larger species than *Hyperoodon rostratum*, as the skull from Greenland in the Newcastle Museum is 92 inches long, while the largest skull of *H. rostratum* that has come under my observation does not exceed 60 or 65 inches.

It is only necessary to examine the figure of the two skulls of *Hyperoodon rostratum* and *H. latifrons* in the Plate to the 'Voyage of the Erebus and Terror,' to see how exceedingly different they are from each other, not only in the form of the skull, but also in the form of the lower jaw. The skull of *H. latifrons* not only differs from that of *H. rostratum* in the thickness and solidity of the frontal crest of the maxillary bones, but in the crest being much higher than the hinder part of the skull; while in all the skulls of *H. rostratum* I have seen, the crest is of the same height with the frontal ridge.

As regards *Hyperoodon rostratum*, Mr. Beardsworth states his specimens to be a female and a young female. The specimen which was shot at Weston-super-Mare, Mr. Crotch informs me, is a female. I may also observe that the specimen of this species described by Mr. William Thompson in the Annals and Mag. of Nat. Hist. 1846, vol. xvii. p. 150, is said to be a male: its skeleton is now in the Belfast Museum. So there are certainly male and female of this species also known.

Mr. Crotch has furnished me with the following measurements of the female specimen taken at Weston-super-Mare, which was exhibited at Bristol:—

	feet.	in.
Total length . . . . .	26	0
From posterior origin of dorsal fin to insertion of the tail . . . . .	6	0
Dorsal in width at base . . . . .	1	11
—— in height . . . . .	1	5
Tail in diameter . . . . .	7	0
—— in depth . . . . .	2	0
Cloaca to insertion of tail . . . . .	5	3
Length of cloacal fold . . . . .	2	0
From anterior of cloaca to pectoral . . . . .	8	6
Length of pectoral . . . . .	2	0
Height of pectoral . . . . .	0	9
—— of body at anterior end of dorsal . . . . .	4	0
—— of body at origin of tail . . . . .	1	4
From gape to muzzle . . . . .	2	0
Vertical height of forehead from gape . . . . .	1	8
—— from insertion of upper jaw . . . . .	0	10
From eye to gape . . . . .	2	0
From eye to spiracle . . . . .	2	0
Girth at the dorsal . . . . .	11	0

	feet.	in.
From cloaca middle to navel middle.....	5	0
From pectoral to pectoral, beneath .....	1	8

The latter measurement shows a character that the figures generally misrepresent, the closeness and lowness of the pectoral fins: they are generally represented as if they were about one-third up the sides of the body, and consequently far apart; but Mr. Beardsworth particularly says that they are so low on the sides, that a stick placed across the body, under the fins, would touch the base of each.

3. NOTES ON THE REPRODUCTION OF THE AUSTRALIAN WATTLE-BIRD (*TALEGALLA LATHAMI*) IN THE SOCIETY'S GARDENS.  
BY A. D. BARTLETT.

The pair of *Talegallas* kept in the Gardens of the Society, during the spring and summer of the present year formed a large mound composed of leaves, grass, earth, and other materials. Within this mound the female deposited twenty eggs. The *time of laying*, the *interval of time between each egg*, and the *period of incubation* are at present unknown to me.

But on the morning of the 26th of August a young *Talegalla* crept out of the mound, and, quite regardless of its parent, ran about searching for worms and other insects, upon which it fed with as much adroitness and apparent knowledge as the chick of a common fowl would exhibit at a month old.

Towards night this young bird flew about among the branches of the trees and shrubs in search of a safe roosting-place, and, having selected one about 6 feet from the ground, settled down and appeared as comfortable and unconcerned as an adult bird,—the female taking no notice whatever of her offspring.

Upon carefully looking into the mound two days afterwards (on the 28th), I observed a second young bird moving about and busily engaged cleaning its feathers with its bill, the wing-feathers at this time being encased in quill-sheaths. This young bird remained in the mound about twenty-four hours after it had escaped from the shell; and during this time the wing and other feathers were freed from their covering, so that the bird was enabled to fly immediately upon quitting the mound, which it did on the morning of the 29th. This second young bird conducted himself in the same manner as his predecessor. The two young birds took no notice whatever of each other, or of the old female, the three birds appearing perfectly independent of each other, *eating, drinking, and roosting separately*; and although an occasional small voice was heard from the young birds, it did not appear to indicate or excite any notice among them. These young birds grow amazingly—so rapidly, that at the age of three months they can scarcely be distinguished from the adult birds.

The foregoing observations lead me to believe that two or three



days may elapse between the laying of each egg. The young birds will consequently come out of the mound in the order in which the eggs were laid, as it is evident that incubation must commence immediately the egg is laid. If, therefore, twenty eggs are laid in forty or sixty days, there must be this number of days difference in the age between the first and the last of the brood, and no two of the young birds could possibly be of the same age.

Perhaps the most remarkable feature connected with this bird is the very perfect development of the young, reminding us strongly of the next division of the vertebrate animals (the *Reptiles*),—not that I can see any connecting links between the great divisions of the *Vertebrata*.

But although it is only in the *Mammalia* that the young are fed by the fluid secreted in the mammary glands, yet in the highest order of the class *Aves* (the *Parrots*) the young are fed partly by the fluid secreted in the œsophagus, mixed with the softened and partially digested food from the crop of the parent birds.

Now in the *Talegalla* we seem to approach the reptilian character not only in the form and general appearance of the eggs, but in the manner in which they are deposited and the absence of care bestowed upon the young.

I believe I am correct in saying that, with this exception, all birds feed or provide food for their young, while, on the other hand, I am not aware that any reptile is known to do so, and that all the reptiles that lay eggs leave them to hatch, and the young to provide for themselves,—their young, as in the *Talegalla*, coming forth in a very perfect and well-developed condition, and being enabled to seek and obtain their food without the aid of the parents. I therefore cannot avoid considering the *Talegalla* and its allies as exhibiting in this respect the lowest form in birds.

#### 4. ON A WEST-AFRICAN GENUS OF SNAKES (*MEIZODON*).

BY DR. ALBERT GÜNTHER.

Fischer has described a Colubrine Snake from West Africa with the name of *Meizodon regularis*\*. Finding its dentition similar to that of *Coryphodon*, from which it considerably differs in general habit, he thought himself justified in separating it generically as *Meizodon*. I have had the opportunity of examining not only *Meizodon regularis*, but also two other Snakes which, in their dentition and in general habit, are the species nearest allied to it, and from which it becomes evident that all three are to be removed from the family of *Colubridæ* to that of *Coronellidæ*. In order to fix their position in the latter family, and to see whether it were possible to keep up a West-African *Coronelline* form of Snakes with *the maxillary teeth gradually increasing in strength*, for which the name of *Meizodon*

\* Hamburg. Abhandl. Gebiet Naturw. 1856, p. 112.

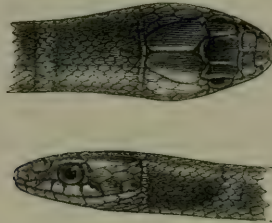
might be retained, I was induced to re-examine all the other African *Coronellidæ*. But I could not convince myself that such a genus would form a naturally defined group. *Coronella cucullata*, with its posterior maxillary tooth grooved; *Ablabes rufulus*, with all the teeth equal in length; *Coronella olivacea*, *C. fuliginoides*, and probably *C. semiornata*, with the posterior tooth longest; and finally, the three species of *Meizodon*, with the teeth gradually increasing in strength,—are so similar to each other in the proportions of the single parts, in the arrangement of the shields of the head, in their physiognomy, in the structure and number of the scales, in the darkness of the colours, that the other character, that of dentition, must give way for generic distinction—the more so as it is very difficult in many specimens, even in some species \*, to say which of the different categories of dentition is prevalent.

I add, for completeness' sake, the diagnosis of *Meizodon regularis* :

**CORONELLA (MEIZODON) REGULARIS.**

Syn. *Meizodon regularis*, Fischer, Hamb. Abhandl. Gebiet Naturwiss. 1856, p. 112; Gthr. Catal. Col. Snakes, pp. 109, 250.

Scales smooth, in nineteen rows; anal bifid; two posterior oculars. Eight upper labial shields, the fourth and fifth coming into the



orbit. Entirely blackish-olive; each scale with a black centre and a pearl-coloured speck at the upper edge; posterior part of the neck with a broad, darker, lighter-edged collar.

*Hab.* West Africa.

The typical specimen is in the Hamburg Museum; another in the Collection of the British Museum.

**CORONELLA (MEIZODON) BITORQUATA, n. sp.**

Scales smooth, in nineteen rows; anal bifid; two posterior oculars. Eight upper labial shields, the fourth and fifth coming into the orbit. Brownish-olive above; a black band across the occipitals, a second across the neck, and a black spot behind the latter on each side of

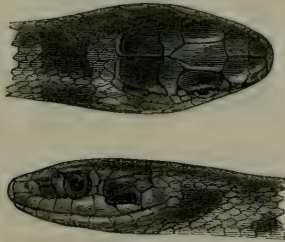
\* In many specimens of *Ablabes rufulus* the teeth are, strictly speaking, not equal, but increase in strength posteriorly. In *Liophis cobella* the character of the longer posterior tooth is little marked; and there are specimens in which all the teeth are of equal size.

the neck, extending on to the ventral shields ; the lower parts dirty yellowish.

*Hab.* Senegal.

The typical specimen is in the British Museum.

*Description.*—Habit like that of *Coronella austriaca* ; number and form of the shields of the head normal ; the posterior frontals are rather longer than, and nearly twice as large as, the anterior ones ; vertical five-sided, slender, with the posterior angle acute ;



occipitals of moderate size, obtusely rounded behind. Nostril between two shields ; loreal square ; anteorbital high, extending on to the vertical ; two posterior oculars in contact with an oblong temporal shield ; three other temporals are behind the latter, the upper of which is elongate, forming a suture with the occipital. Eight upper labial shields, the fourth and fifth coming into the orbit. Scales short, rhombic, smooth, in nineteen rows. Ventral shields 205 ; anal 1/1 ; caudal 75. The colours have been described in the diagnosis ; the ground-colour changes into lead-grey after the epidermis has been rubbed off. The maxillary teeth form one continuous series ; anteriorly small, they gradually become longer and stouter posteriorly ; none of them are grooved.

	inches. lines.	
Length of the head .....	0	4
——— of the trunk .....	8	0
——— of the tail .....	2	3

**CORONELLA (MEIZODON) DUMERILII, n. sp.**

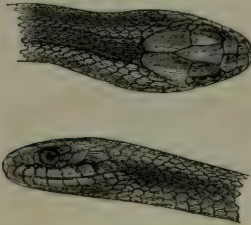
Scales smooth, in nineteen rows ; anal bifid ; three posterior oculars. Eight upper labial shields, the fourth and fifth coming into the orbit. Greyish-brown above, with a darker, white-edged longitudinal band occupying the five medial dorsal series of scales and extending from the neck to the tail, where it gradually disappears ; another rather indistinct whitish line running along the fourth outer series of scales. Belly whitish.

*Hab.* Sierra Leone.

The typical specimen is in the British Museum.

*Description.*—Habit like that of *Coronella austriaca* ; number and form of the shields of the head normal ; the posterior frontals

are as long as, and not much larger than, the anterior ones; vertical five-sided, slender, with the posterior angle very acute; occipitals of moderate size, tapering behind, but with the extremity rounded. The shield which is pierced by the nostril is very indistinctly divided



into two; loreal square; anteorbital high, not extending on to the vertical; three posterior orbital shields; an oblong temporal shield is in contact with the two inferior oculars; three or four scale-like temporals behind the anterior one. Eight upper labials, the fourth and fifth coming into the orbit. Scales short, rhombic, smooth, in nineteen rows. Ventral shields 143; anal 1/1; caudal 85. The colours have been described in the diagnosis; the ground-colour changes into lead-grey, after the epidermis has been rubbed off. The maxillary teeth form one continuous series; anteriorly small, they gradually become longer and stouter posteriorly, and none of them are grooved.

	inches.	lines.
Length of the head .....	0	4½
——— of the trunk .....	8	0
——— of the tail .....	3	5

This species is dedicated to the memory of the late Prof. A. M. C. Duméril.

##### 5. NOTE ON *ASPIDOCHELYS LIVINGSTONII*. BY DR. JOHN EDWARD GRAY, F.R.S., V.P.Z.S., ETC.

In the 'Proceedings' for this year, p. 5, I described and figured a Soft Freshwater Turtle from the Zambesi under the name of *Aspidochelys livingstonii*; at p. 314 are printed some further observations on the African *Trionyches* with hidden feet (*Emyda*); and in both these papers I state that I had not been able to find any published description of a Tortoise from Zanzibar that Dr. Peters had indicated to me in a letter to myself in 1840 under the name of *Cyclanosteus frenatus*.

Dr. Peters, through Mr. Selater, has kindly referred me to a paper by him on the Tortoises found during his travels, in the

'Bericht der Königl. Akad. zu Berlin,' for 1854, p. 276, where the Tortoise from Zanzibar is very briefly described, but under the name of *Cycloderma frenatum*; and has stated that he believes it is the same as the one I described from the Zambesi. Mr. Sclater says that he has seen two or three fine perfect specimens of this Tortoise in the Berlin Museum. Under these circumstances, there can be no doubt that my name must give way to that used by my friend Dr. Peters.

I may at the same time observe that the genus *Cycloderma* is so characterized by Dr. Peters that it will include all the African *Emydæ*, all of which have the dorsal disk flexible on the margin and without any marginal bones. On the contrary, my genus *Cyclanosteus*, to which I had provisionally referred Dr. Peters's species, is by its character confined to those species of the African *Emydæ* which have nine sternal callosities.

As Dr. Peters, before he published the characters of the genus, considered it desirable to change the name of the genus which I had adopted from his MS. communication; and founded his genus *Cycloderma* on a species that has only seven sternal callosities (though he only mentions the number of the callosities in the specific character, and probably would have considered my animal with nine callosities as the second species of his genus), I think, if the two animals are to be kept in different genera, as I am of opinion they ought to be, we ought in justice to retain his name for the restricted genus, in preference to my name of *Aspidochelys*, or Mr. Cope's genus *Heptothyra*, which are founded on this peculiarity.

The synonyma of the Zambesi and Zanzibar Tortoise will then stand thus:—

*CYCLODERMA FRENATUM*, Peters, Bericht. 1859, p. 216.

*Cyclanosteus frenatus*, Peters, MS. 1848; Gray, Cat. Tortoises Brit. Mus. p. 64. 1855; Proc. Zool. Soc. 1860, p. 314.

? *Aspidochelys livingstonii*, Gray, Proc. Zool. Soc. 1860, p. 5. t. 22, and p. 316.

As the head of the *Aspidochelys* is not known, and the colour of the head forms one of the best characters for the separation of the species of *Trionychidæ*, we cannot refer the Zambesi species to the Zanzibar animal with certainty until an entire specimen of the former animal has been examined; but, at any rate, it appears to be a species of the genus *Cyclanosteus* of Dr. Peters, restricted as I propose.

6. DESCRIPTIONS OF FORTY-SEVEN NEW SPECIES OF SHELLS FROM THE SANDWICH ISLANDS, IN THE COLLECTION OF HUGH CUMING. BY W. HARPER PEASE, ESQ.

*BULLA MARMOREA*.

Shell ovately oblong, light, thin, perforate, outer lip straight;

longitudinally finely striated and marked with fine microscopic spiral striæ. Colour chocolate-brown, mottled with darker, and freckled and blotched with white.

#### HAMINEA GALBA.

Shell oval, light, shining, yellowish; marked with longitudinal lines of growth, and finely microscopically spirally striated; outer lip nearly straight, and very slightly produced posteriorly; inner lip thickened somewhat at the base, and slightly reflected; columella strongly arched at lower part.

The shell of this species can hardly be distinguished from that of *H. crocata* (nob.); but the animal differs widely; its description was given, by mistake, as that of *H. crocata*, and may be found on page 20 of 'Proc. Zool. Soc.' for 1860.

The description of the animal of *H. crocata* we give below:—

#### HAMINEA CROCATA (nob.).

*Animal*.—Cephalic disk square, oblong, in advance of the shell, slightly notched at the centre of the front side, at the posterior side provided with a pair of flat, rather broad, recumbent lobes, which are rounded at their extremities; lateral lobes reflected on the sides of the shell two-thirds of its length; foot extending beyond the shell posteriorly, and rounded at its termination. Colour cinereous; pellucid.

#### CERITHIUM GRACILE.

Shell light, thin, turreted, slender; whorls convexly rounded, ribbed longitudinally and varicose, ribs rounded and becoming obsolete on the last whorl, ornamented with spiral raised striæ or ribs which are somewhat flexuous and alternately smaller; aperture oval; outer lip somewhat expanded; columella arcuate and callous, callosity joining the outer lip posteriorly; canal short, slightly recurved. Colour white or light-fawn, irregularly marked with brown.

#### CERITHIUM UNILINEATUM.

Shell small, subulate, turreted; whorls longitudinally ribbed, varicose, spirally finely ribbed; aperture ovate. Colour white, spotted with brown, spots arranged spirally; a band of dark purple encircling the whorls, at their upper margin.

#### CERITHIUM FUCATUM.

Shell light, thin, vitreous, pyramidal; whorls seven or eight, slightly convex, ornamented with three equal rows of granules, and the interstices with a single ridge and fine microscopic striæ, granules becoming obsolete on last whorl; last whorl ribbed and longitudinally striated, striæ fine, microscopic; aperture oval; outer lip slightly expanded; canal short, nearly closed. Colour yellowish-fawn, irregularly spotted with brown.

**CERITHIUM ASPERUM.**

Shell pyramidal; whorls slightly convex, encircled in the middle with a row of nodules, and on either side a row of granules; interstices spirally striated, striæ raised and unequal in size; aperture ovate; columella arcuate, a slight callosity posteriorly; canal short. Colour whitish or light-fawn; nodules and striæ reddish brown.

**CERITHIUM PAXILLUM.**

Shell somewhat ovate, turreted; whorls seven, slightly convex and varicose, ornamented with four rows of granules, and interstices with fine raised striæ, longitudinally rudely ribbed, ribs and granules becoming obsolete at the periphery of the last whorl; columella arcuate, and callous within; aperture ovate, canal very short. Colour light brown, granules black.

**CERITHIUM BETICUM.**

Shell turreted; whorls seven or eight, slightly convex, spirally ribbed; ribs regular, depressed, alternately smaller, obsoletely varicose; aperture ovate; canal very short, abruptly truncate. Colour light-fawn, ribs black, or black with a yellowish band at the margins of the whorls, or spotted and marbled with different shades of brown, fawn-colour, and white.

**VERTAGUS GRANIFERUS.**

Shell subulate; whorls about twelve, flat, bordered by prominent and slightly elongate granules on both sides, intermediate space ornamented with two rows of granules of smaller size, interstices filled by a ridge, somewhat flexuous; aperture small, oblique, elongate-oval; columella slightly arched, callous, and furnished with a single fold. Colour white or dusky, spotted irregularly with brown, spots at the margins of the whorls darker and more regular.

**BITTIUM TRICARINATUM.**

Shell light, thin, shining, turreted; whorls eight, carinated by three spiral ribs, interstices finely spirally striated and ornamented by longitudinal ribs which are somewhat curved, rather distant, and become granulose at the crossing of the transverse ribs, giving the shell a clathrated appearance; aperture oval; columella arcuate, and twisted at lower part; base subplanulate and ornamented with diverging raised striæ. Colour brown.

**TRIPHORIS TRITICEA.**

Shell minute, fusiformly ovate, ornamented throughout by spiral rows of regular-sized granules; aperture oval and in a line with the axis of the shell, lip slightly recurved and thickened (plicate on the inner side?); canal posterior, enclosed, tubular. Colour dark purplish-red, granules dusky white.

**TRIPHORIS FUCATA.**

Shell elongate subulate; whorls sixteen to eighteen, with three

granulose ribs and one much smaller at the suture; base subplanulate; canal short and recurved. Colour white, spotted irregularly with brown.

37  
1962  
**TRIPHORIS AFFINIS.**

Shell elongately turreted, shining; whorls composed of three regular-sized rows of granules; canal short, tubular. Colour reddish brown.

13 20.  
1962  
**TRIPHORIS CINGULIFERA.**

Shell subulate; whorls about ten, ornamented by a row of granules at both margins, interstices concavely rounded, with a raised stria at the upper side, last whorl with three granulose ribs; canal short and tubular. Colour waxy-yellow, lower row of granules and ribs on last whorl purplish-red.

**TRIPHORIS FLAMMULATA.**

Shell elongately pyramidal; whorls twelve to fourteen, spirally carinately ribbed, ribs three, central one much the smallest, a rib of same size at the sutures; canal tubular, enclosed. Colour white, marked with spots and longitudinal flammules of light yellowish-brown.

2 20.  
1962  
**TRIPHORIS CLAVATA.**

Shell elongate subulate; whorls fifteen to eighteen, bordered on each side by a row of granules, interstices concavely rounded, finely striated spirally, and bordered against the upper row of granules by a light ridge, obsolete granulose; canal slightly recurved. Colour white or yellowish, interstices between the granules of a purplish or reddish brown, and spotted irregularly with the same.

10 1.  
1962  
**TRIPHORIS ALTERNATA.**

Shell turreted; whorls composed of three regular-sized rows of granules, the middle one of dark reddish brown, the remaining two of a waxy-yellow colour; base longitudinally striated; canal closed, tubular.

**TRIPHORIS INCISA.**

Shell subulate; whorls encircled by three prominent smooth and regular ribs, interstices deep and very finely striated longitudinally, irregularly spotted and marbled with yellowish-white, brown, and purple of various shades.

**TRITON PUSILLA.**

Shell small, fusiform; whorls six, non-varicose, plicately ribbed longitudinally and spirally striated; aperture oblong oval, less than one-half the length of the shell; columella arcuate posteriorly, callous, smooth; outer lip denticulate; canal short, slightly recurved. Colour white, with irregular brown spots or flammules longitudinally disposed,



interrupted in the centre of each whorl by a narrow transverse white line.

**NERITINA NEGLECTA.**

Shell obliquely ovate; spire very small, consisting of one whorl, depressed; finely striated spirally, and longitudinally engraved with irregular striæ; columellar-area smooth, slightly curved, toothed in the centre; teeth seven or eight, covering rather more than half of the area; aperture expanded. Colour black, spotted irregularly with white.

**VANIKORO SEMIPLICATA.**

Shell ovately globose, white, ornamented with spiral raised striæ, interstices very finely striated; spire longitudinally ribbed, ribs becoming obsolete on the last whorl; umbilical aperture finely grooved, edges rounded.

**VANIKORO IMBRICATA.**

Shell obliquely ovately globose, light, thin, fragile, white, obliquely and longitudinally finely ribbed, crossed by spiral raised striæ; umbilical aperture coarsely ribbed.

**EUCHELUS CORRUGATUS.**

Shell globosely conic, turbinate, spirally ribbed and obliquely longitudinally striated; aperture nearly circular, umbilicated; outer lip thickened internally and ribbed. Colour light green, spotted with darker, spots arranged longitudinally and obliquely.

**EUCHELUS FIMBRIATUS.**

Shell globose conic, white, carinately ribbed; ribs spiral, prominent and fimbriated at their edges; interstices ribbed longitudinally and obliquely and deeply punctured; aperture oval, brilliantly iridescent within; outer lip ridged internally, indented at the umbilical region.

**MARGARITA MARMOREA.**

Shell somewhat depressly turbinate; spire short, spirally striated; aperture circular, umbilicate; inner lip reflected over the umbilical region. Colour light green, clouded with white and green of different shades, and marked with occasional longitudinal and oblique zigzag lines of dark green.

**TURBO SEMICOSTATUS.**

Shell depressly ovate, finely striated obliquely and longitudinally; spire and upper part of last whorl ridged, lower half smooth, ridges irregular in size, somewhat angulated at the centre; aperture circular, lip slightly effuse at base, imperforate. Colour light brownish red, marbled and variegated with darker, and ornamented with a broad yellowish spiral band below the periphery of the last whorl.

**TURBO SANDWICENSIS.**

Shell ovately turbinated, slightly perforated, somewhat tubulous, spirally ridged; ridges smooth, alternately rather smaller, squamose; scales most prominent on the last whorl, becoming obsolete near the base and on the upper whorls, interstices between the ridges finely imbricately laminated; last whorl somewhat angulated at the upper part. Colour green, marbled and variegated with dark brownish red.

**COLLONIA? CANDIDA.**

Shell minute, thin, perforate, orbicular, ornamented with raised spiral striæ (margins of upper whorls granulose at the sutures?); inner lip callous; aperture circular.

**COLLONIA VARIABILIS.**

Shell small, thin, ovate, shining; whorls three or four, convexly rounded, marked with very fine obliquely longitudinal striæ; inner lip callous, slightly expanded at the base; indented at the umbilical region, and with a groove behind the inner lip; aperture ovate. Colour white, variously painted with pink lines and blotches; the lines fine, oblique, extending over a portion of the whorls, sometimes flexuous and covering the whole surface; blotches of a longitudinal shape; the periphery of the last whorl usually ornamented with a row of pink spots.

**ALCYNA RUBRA.**

Shell small, ovate, smooth, polished; whorls four, convexly rounded; aperture ovate; indented at the umbilical region, and grooved; columella with a prominent tooth near the base. Colour red, of different shades, or painted in a variety of patterns with blotches and spots of white and red, or marked with oblique longitudinal red lines.

**ALCYNA SUBANGULATA.**

Shell minute, rather solid, turbinated, ovate, ornamented with raised spiral striæ; whorls four, depressed somewhat in the centre; outer lip thickened externally; aperture circular; columella ending in a prominent tooth. Colour deep red, with oblique light-red lines.

**CASSIS UMBILICATA.**

Shell ovately globose; spire somewhat acuminate, acute, univentricose; whorls transversely ribbed, granulose towards the apex, ribs on last whorl strong, somewhat angular at their margins and slightly depressed, interstices deeply grooved; outer lip reflected and much thickened, dentately ridged, middle and upper ridges superficially bisected, and interstices between the centre ridges nodulous; the upper half of inner lip ribbed, the transverse ribs of the last whorl extending over it regularly and passing within; the ribs at the lower half of the inner lip (which are interrupted by a plait that extends over the columella) are close, much smaller, and somewhat wrinkled;

columella twisted and rolled, being produced in a tubular form, perforate. Colour cinereous, marked with irregular brown spots and blotches; apex reddish or purplish brown.

**TUGALIA OBLONGA.**

Shell oblong oval, depressly conical, radiately ribbed; ribs granulose, interstices decussated by concentric raised striæ; apex near posterior margin white.

**SCUTELLINA CANCELLATA.**

Shell oval, somewhat conical; surface cancellated by fine radiating ribs and concentric raised striæ; apex extending to the posterior margin. Colour white.

**MUCRONALIA ROSEA.**

Shell elongate ovate, smooth, polished; whorls six, convexly rounded; aperture oval. Colour rose-pink.

Found on *Echini*.

**MUCRONALIA NITIDULA.**

Shell small, subulate, thin, polished, vitreous; whorls convexly rounded, five in number, nucleus of three whorls slightly distorted; aperture small, ovate; inner lip slightly thickened and reflected at its junction with the columella. Colour white or light fawn-colour.

Lives on *Holothuriæ*.

**MUCRONALIA OVATA.**

Shell elongately ovate, light, dull shining; whorls five, slightly convex; inner lip thickened at the base and extending by a callosity over the columella to the junction of the outer lip. Colour dull white.

Lives on *Echini*.

**STYLIFER ROBUSTUS.**

Shell globosely ovate, light, polished; finely striated longitudinally; whorls convex and marginated, last whorl swollen, sutures well impressed; inner lip slightly reflected at its junction with the columella and around the base, disappearing at about the centre of the outer lip. Colour white.

Lives on *Echini*.

**PATELLA SANDWICENSIS.**

Shell ovate, raised; apex slightly anterior, radiately ribbed; ribs irregular, crenate, alternately smaller. Colour fulvous; ribs black; interior iridescent, silvery-blue.

**TECTURA RADIATA.**

Shell conical, oval, smooth, radiately ribbed; ribs few in number, wide, and becoming obsolete on the upper half of the shell; apex in

a line with posterior margin of the shell. Colour brownish red, ornamented with white or reddish-white diverging lines.

**EULIMA ACICULATA.**

Shell slender, acicular, smooth, shining, polished; whorls about twelve, flattened; sutures faintly defined; apex slightly distorted; aperture small, oval; lip plain, simple. Colour white.

**LEIOSTRACA DISTORTA.**

Shell small, subulate, light, thin, smooth, transparent, curved and distorted; whorls about eight, flattened, the last about half the length of the shell; aperture oblong oval, rather more than half the length of last whorl; inner lip continued by a callosity over the columella to its junction with the outer lip. Colour white.

**TURBONILLA DECUSSATA.**

Shell subulate, light, thin, white, longitudinally ribbed and decussately spirally striated; ribs about twenty in number, becoming obsolete at the periphery of the last whorl, spiral striæ continuing to the base; whorls ten, convexly rounded, the first few shouldered posteriorly, irregularly varicose; varices four or five in number, about twice the width of the ribs and with their surface transversely striated; outline of the spire slightly curved; sutures well impressed; aperture oval; columella indentedly curved; inner lip straight, very slightly recurved at base.

**RISSOINA TRITICEA.**

Shell somewhat fusiformly ovate; whorls five, convexly rounded, the last more than half the length of the shell, longitudinally ribbed; ribs nine, prominent, smooth, continuous over the sutures; aperture ovate; outer lip thickened externally; suture at base slight. Colour white.

**RISSOINA TURRICULA.**

Shell turreted; whorls six, slightly angulated at the upper part, finely striated transversely, ribbed longitudinally; ribs ten, prominent; the last whorl encircled by a groove near its base; aperture ovate; suture at the base broad. Colour white.

**RISSOA GRACILIS.**

Shell slender, elongate, shining, ribbed longitudinally, ribs somewhat flexuous; whorls convexly rounded; aperture oval. Colour reddish-brown.

7. DESCRIPTIONS OF SIX NEW SPECIES OF LAND SHELLS, FROM THE ISLAND OF EBON, MARSHALL'S GROUP, IN THE COLLECTION OF H. CUMING. BY W. HARPER PEASE.

Genus LAMELLINA, Pease.

Shell imperforate ; whorls smooth ; columella twisted, and furnished with a lamelliform anterior plait and a spiral lamella on the columellar lip ; last whorl with internal longitudinal lamellæ ; outer lip simple, acute.

LAMELLINA SERRATA.

Shell minute, thin, lucid, fragile ; conically ovate ; whorls five, convex ; aperture small, ovate, less than one-half the length of the shell ; a spiral lamella on the centre of the columellar lip and one at the base ; last whorl furnished with three longitudinal lamellæ, extending its whole length and disposed at equal distances from the outer lip, at about one-sixth of the circumference of the whorl apart ; edges of the lamellæ serrated.

TORNATELLINA NITIDA.

Shell small, ovately turreted, thin, fragile, of a light horn-colour ; whorls six, rounded, last whorl flattened and slightly depressed around the middle ; aperture small, ovate, less than one-half the length of shell ; outer lip simple, acute, slightly contracted at the middle ; plait on inner lip prominent ; base of the columella slightly reflected over the umbilical region and furnished with one or two plaits or tooth-like projections.

HYDROCENA FRAGILIS.

Shell ovately conical, thin, light, turreted, perforate, of a light horn-colour, encircled by narrow reddish-brown bands which are sometimes interrupted, or ornamented with longitudinal flammules or blotches of the same colour ; whorls six or seven, convex, last whorl slightly angulated at the middle ; aperture oval ; outer lip thin, simple ; umbilicus entering by a grooved channel, over which the inner lip is slightly reflected.

HELIX STRIOLATA.

Shell small, orbicular, thin, fragile, imperforate ; spire slightly elevated, convex beneath, and ornamented with minute revolving striæ ; whorls five, rounded, slightly angulated at the periphery ; aperture lunate ; light horn-colour.

VERTIGO NITENS.

Shell cylindrically oval, thin, pellucid, imperforate, apex obtuse ; minutely striated, striæ longitudinal and slightly oblique ; whorls five, rounded ; sutures impressed ; aperture subquadrate, rounded at the corners ; lip slightly expanded and reflexed, furnished internally with three teeth, about equal distances apart, one of larger size, and bipartite on centre of columella, and one at the base. Colour white.

## REGISTOMA COMPLANATUM.

Shell elongately circular, light, thin, pellucid, vitreous, straight; whorls six, last slightly oblique, surface smooth, enamelled [sutures marginated (?) but covered with enamel, rendering the entire surface smooth]; apex obtuse; aperture nearly circular (semilunar); outer lip slightly thickened externally; inner lip notched at base. Colour light brownish yellow.

## 8. DESCRIPTION OF NEW NUCULIDÆ. BY SYLVANUS HANLEY.

**LEDA CONRADI.** *T. subovato-acuta, postice longior et acutissime acuminata, valde inæquilateralis, radii impressi expers, cute subolivaceo-flava induta, costis crassis concentricis (ad marginem plicæ umbonalis angularem pluribus) et sulcis superne latis, inferne angustis, undique sculpta. Margo dorsalis antice subdeclivis; postice rectiusculus, declivis. Area magna, angulatim definita, inferne plicato-corrugata. Lunula nulla.*

Long.  $\frac{3}{8}$ , lat.  $\frac{2}{9}$  poll.

Hab. — ?

Mus. Taylor.

The form reminds one of Conrad's *L. eborea*, but the sculpture differs. The ribs on the posterior ridge form obtuse angles with the concentric ones.

**LEDA BROOKII.** *T. minuta, subæquilateralis, late ovato-conica, postice repente acuminata, vixque recurvata, ventricosa, eburnea, radii impressi expers, undique concentricè costata; interstitia costarum angustarum æqualiter lata, in medio lævia, utrinque creno-lirata. Margo dorsalis antice brevis, satisque declivis; postice rectiusculus, declivis; ventralis conspicue arcuatus, postice rectior multumque acclivis. Area magna, plica umbonali depressa creno-costata definita. Lunula sublævigata, sulco circumscripta.*

Long.  $\frac{5}{23}$  poll.

Hab. Insula Borneo.

Mus. Cuming.

In the larger of the only two examples known to me, the front dorsal area is traversed by a kind of interrupted continuation of the ribs.

**LEDA HINDSII.** *T. parva, subæquilateralis, anguste ovato-acuta, antice plica sulcoque lato radiata, postice costa umbonali carinata, superficiem lævigatam superiorem sequente, munita, alibi concentricè costellata; interstitia liris minutis undique decussata. Extremitas postica acuminata, vix recurvata. Area magna, concava, arcte longitudinaliter costellato-striata; interstitia impressa, punctulata. Lunula parva, transversim tuberculata.*

Long.  $\frac{2}{9}$  poll.

Hab. Nicoyæ fretum?

Mus. Cuming, Hanley, Metcalfe.

Mr. Hinds referred this shell to his *Nucula crispa*; it is very distinct, however, from the delineated type.

**SOLENELLA CUMINGII.** *T. S. norrisiæ simillima, sed antice multum longior, et tantum rotundato-attenuata; radii impressi obsoleti. Extremitas postica latiuscula, obsolete biangulata, vel rotundato-subrhomboidalis. Margo dorsalis anticus convexus, satisque declivis; posticus brevis, vixque declivis. Dentes postici permulti.*

Long.  $1\frac{3}{5}$  poll.

Hab. Insulæ Falklandicæ.

Mus. Cuming.

The most striking peculiarity is that the anterior side, which is the shorter in *S. norrisia*, is in this species the longer.

**NUCULA MALABARICA.** *T. minuta, trigona, haud elongata, satis obliqua, tantum ad umbones angustos et elevatos ventricosa, superne rectungulata, nitida, undique concentrice costellata: sulci interstitiales liris radiantibus exilibus ornati. Latus posticum (pro genere ejus) haud breve, ad extremitatem subangulatam prominens. Margo dorsalis uterque declivis et rectus: ventralis regulariter arcuatus, haud sinuatus, intus crenatus; cardinalis latus. Dentes pauci: fossa cartilaginis perparva, haud obliqua.*

Long.  $\frac{1}{2}$  poll.

Hab. Cochîn.

Mus. Hanley.

Found in the mouths of dead Solariform *Margaritæ*.

**NUCULA ANTIPODUM.** *T. valde obliqua, elliptica, postice recte truncata, antice rotundato-attenuata, maxime inæquilateralis, valida, subventricosa, lævis, cute nitida pallide olivaceo-lutescente vel cinerascete induta, intus argentea. Margo dorsalis antice convexus, declivis; ventralis arcuatus, integer, postice haud sinuatus et ibi conspicue acclivis, cum margine postico rectiusculo angulum valde obtusum formans. Nates parvæ, acutæ, haud prominentes. Lunula magna, concentrice subrugosa, planulata, angulo definita. Area inconspicua.*

Var. *Extremitas antica tantum rotundata; postica aliquantum prominens, magisque angulata.*

Long.  $\frac{3}{8}$  poll.

Hab. Australia.

Mus. Hanley.

This may possibly be the *N. obliqua* of the 'Voyage de la Vénus'; it is not, however, the species so termed by Lamarck.

**NUCULA M'ANDREWII.** *T. anguste subovata, in medio lator, per tenuis, semipellucida, valde compressa (nisi ad umbones), cute nitidissima cinerea induta, undique lævis. Extremitas antica superne rotundato-obtusangularis; postica minime brevis (pro genere ejus), fere in medio rotundato-acutangularis. Margo dorsalis antice rectiusculus, haudque declivis; ventralis integer, mul-*

*tum arcuatus, postice multum acclivis. Nates peracutæ, haud tamen valde eminentes. Area dorsales subimpressæ, haud circumscriptæ; lunule labiis carinato-protrusis.*

Long.  $\frac{2}{5}$  poll.

Hab. Tunis (M' Andrew).

Mus. Cuming.

Allied to *N. tenuis* and *N. inflata*.

The following list of additions to the Menagerie, by gift, purchase, and exchange, during the month of November, was read:—

		Presented by
1 Capuchin Monkey	<i>Cebus</i> — ?	E. Kessor, Esq.
2 Wydah Birds	<i>Vidua paradisæ</i>	} A Lady from Mozambique.
2 Wax-bills	<i>Estrela</i> — ?	
1 Snake	<i>Xenodon rhabdocephalus</i>	} Dr. O. Wucherer of Bahia.
1 Lizard	<i>Sphærops anomalus</i>	
1 Agouti	<i>Dasyprocta aguti</i>	John Bayliss, Esq.
7 Young Salmon	<i>Salmo salar</i>	Alfred Smeë, Esq.
1 Agouti	<i>Dasyproctus aguti</i>	— Hampton, Esq.
1 Syrian Chameleon	<i>Chamæleo africanus</i>	I. Warner, Esq.
2 Peregrine Falcons	<i>Falco peregrinus</i>	Major Magenis.
2 Porcupines	<i>Hystrix cristata</i>	H. R. H. Prince Alfred.
1 Ichneumon	<i>Herpestes griseus</i>	Lieut. C. J. Burgess, 46th Regiment.
1 Bonnet Monkey	<i>Macacus pileatus</i>	Walter Blackmore, Esq.
1 Rhesus Monkey	<i>Macacus rhesus</i>	Mrs. Gaskell.
1 Spanish Chameleon	<i>Chamæleo africanus</i>	F. T. Streeton, Esq.
1 Babirussa	<i>Babirussa alfurus</i>	} In exchange.
1 White-lipped Peccary	<i>Dicotyles albirostris</i>	
1 Javan Wild Boar	<i>Sus vittatus</i>	
2 Java Cocks (hybrid)	<i>Gallus furcatus</i> , ♂	
	<i>Gallus bankiva</i> ♀	
2 Hybrid Ducks	<i>Aix sponsa</i> , ♂	
	<i>Nyroca leucophthalma</i> ♀	
2 Hybrid Ducks	<i>Aix sponsa</i> , ♂	
	<i>Fuligula ferina</i> ♀	
1 Barnacle Goose	<i>Bernicla leucopsis</i>	
3 Skylarks	<i>Alauda arvensis</i>	
3 German Loach	<i>Cobitis fossilis</i>	
1 Velvet Duck	<i>Ædemia fusca</i> , ♀	
1 Ring Ouzel	<i>Turdus torquatus</i>	
1 Common Coot	<i>Fulica atra</i>	
1 Jay	<i>Garrulus glandarius</i>	
1 Short-eared Owl	<i>Otus brachyotus</i>	
2 Red-headed Pochards	<i>Fuligula ferina</i>	

Of these, *Xenodon rhabdocephalus*, *Sphærops anomalus*, *Babirussa alfurus*, *Sus vittatus*, and *Cobitis fossilis*, were stated to be exhibited for the first time.







J. Gray, Lith.

M & N. Hanhart, Imp.

December 11th, 1860.

Dr. J. E. Gray, V.P., in the Chair.

Mr. Sclater called the attention of the meeting to an important addition to the Society's Menagerie made by the recent accession of a fine young male Babirussa (*Babirussa alfurus*) (Mammalia, Pl. LXXXIII.), received in exchange from the Zoological Society of Rotterdam. The species of the *Suidæ* now living in the Society's Gardens were thus increased to nine in number, being undoubtedly the finest series of the group ever yet brought together; namely:—

1. *Sus scrofa*, ex Europa.
2. ———, var. *barbarus*, ex Afr. bor.
3. ——— *vittatus*, ex Java.
4. *Potamochoerus africanus*, ex Afr. merid.
5. ——— *penicillatus*, ex Afr. occ.
6. *Babirussa alfurus*, ex ins. Celebes.
7. *Dicotyles torquatus*, ex Am. centr. et merid.
8. ——— *albirostris*, ex Am. merid.
9. *Phacochoerus æthiopicus*, ex Afr. merid.

One of the female Peccaries (*D. torquatus*) had lately produced a young one,—the first occasion (so it was believed) that this animal had bred in confinement in England.

Mr. A. Newton informed the meeting of the important fact, that a recent discovery of bones, supposed to be those of a Dodo (*Didus*), had been made in the Mauritius by Dr. Ayres, which would be transmitted to the British Museum.

The following papers were read:—

1. NOTE ON *OVIS POLII* OF BLYTH. BY P. L. SCLATER, M.A.,  
SECRETARY TO THE SOCIETY.

I beg leave to call the attention of the Society to a very fine pair of the horns of the Wild Sheep of Pamir, *Ovis polii*, Blyth (P. Z. S. 1840, p. 62, and Ann. N. H. vii. p. 196), belonging to Major W. E. Hay, F.Z.S. This is one of the several pairs brought back by Lieut. Wood in 1838 on his return from his journey to the sources of the Oxus, when detached from Sir Alexander Burnes's mission to Cabool. Having been unaccountably neglected and thrown out into the open air at Loodianeh\* to perish, they were rescued by Col. Stedman in 1843, and presented to Major Hay, who brought them home on his return from India in 1858.

There being, I believe, only two pairs of the horns of this magni-

\* "A skeleton of this animal and several complete crania were deposited, I believe, at Loodianeh, with other specimens obtained by Sir A. Burnes's mission."  
—Wood's Journey to the Source of the River Oxus, p. 193 (note).

ificent Sheep known to exist in this country, the acquisition of a third is of much interest. The following are the dimensions of this pair, which seem to be about the same size as those described by Mr. Blyth:—

	inches.
Distance between the horns, from point to point . . .	49
Length of each horn from the base to the tip, following the curvature . . . . .	46
Girth at base . . . . .	15

They also perfectly agree otherwise with Mr. Blyth's description, turning at their origin backwards and outwards, then descending nearly perpendicularly, but slightly inclined outwards, whence they curve upwards, and terminate in points directly divergent from the body, as shown in the subjoined woodcut.



2. REPORT ON THE INDIAN PHEASANTS BRED IN THE SOCIETY'S MENAGERIE DURING THE YEARS 1858, 1859, AND 1860\*. BY PHILIP LUTLEY SCLATER, M.A., SECRETARY TO THE SOCIETY.

At the commencement of the present year, our breeding stock of the five species of Himalayan Pheasants consisted of three pairs of the Black-backed, two pairs of the White-crested, and one pair of the Purple Kaleege, one pair of Cheers, and three of Impeyans. These ten females produced altogether 141 eggs, being 27 less than the same number produced in the previous year. The number of young birds hatched, however, was greater, being 82 instead of 62. But the number reared, owing to the bad weather, for which the present summer has been notorious beyond all precedent, has been slightly less—being only 45 instead of 50. The whole of the young birds have been disposed of without difficulty among the members and correspondents of the Society, except the four young Impeyan

\* For a previous Report on this subject, see P. Z. S. 1858, p. 544.

Pheasants; for which, however, there are numerous applicants as soon as the sex of the birds shall be ascertainable.

The following lists give the results of the breeding-seasons of 1858, 1859, and 1860, compared together in a tabular form:—

Date.		No. of Hens.	Eggs laid.	Young hatched.	Reared.	Died.
1858.	Black-backed Kaleege .....	5	184	63	61	2
	White-crested Kaleege .....	1		6	5	1
	Purple Kaleege .....	1		19	17	2
	Cheer Pheasant .....	2		26	25	1
	Impeyan Pheasant .....	2		12	8	4
		11	184	126	116	10
1859.	Black-backed Kaleege .....	3	59	18	16	2
	White-crested Kaleege .....	2	33	12	9	3
	Purple Kaleege .....	1	22	8	7	1
	Cheer Pheasant .....	2	44	19	15	4
	Impeyan Pheasant .....	2	10	5	3	2
		10	168	62	50	12
1860.	Black-backed Kaleege .....	3	47	27	14	13
	White-crested Kaleege.....	2	24	20	12	8
	Purple Kaleege .....	1	17	11	8	3
	Cheer Pheasant.....	1	20	13	7	6
	Impeyan Pheasant .....	3	33	11	4	7
		10	141	82	45	37

### 3. DESCRIPTION OF TWO NEW SPECIES OF ENTOMOSTRACOUS CRUSTACEANS FROM INDIA. BY W. BAIRD, M.D., F.L.S.

(Annulosa, Pl. LXXII.)

#### Order PHYLLOPODA.

##### 1. STREPTOCEPHALUS DICHOTOMUS (male). (Pl. LXXII. fig. 2.)

The body of this little Phyllopod is elongate and of a dark brown colour (in spirits). In general form it resembles a good deal the *Branchipus torvicornis* of Waga, found in the neighbourhood of Warsaw. The peculiar twisted and elongated antennæ (characteristic of the male) are furnished with several filaments, and are divided at the extremity into two forks, one of the divisions of which (the longer) is again bifurcate at the extremity. This larger division of the fork is armed with several teeth on the outer edge. The tail is bifurcate, the divisions being, each of them, densely and strongly ciliated on the inner edges.

Length of body about three-fourths of an inch; length of antennæ about half an inch.

This curious creature was said to have been found alive in a pail of milk.

*Hab.* India.

#### Order CLADOCERA.

##### 2. DAPHNIA NEWPORTII. (Pl. LXXII. fig. 3.)

Carapace-valves oval, terminating posteriorly in a rather long sharp spine directed a little backwards, and furnished on both sides with spines. The surface of the shell is reticulated and hirsute, being roughened all over with short spines. The margins of the carapace are beset with short spines also, the dorsal margin from the extremity to the base of the head, the ventral margin for nearly half its length. The head is very obtuse and rounded, terminating anteriorly in a short, sharp beak. The rami or inferior antennæ are of considerable size, and the setæ or filaments are finely plumose. The sixth segment of the body of the animal has five or six projections from it, two or three of which are small and rough, with very minute spines. The first is the longest, being prolonged and curved upwards; the second is large and well-marked; and between the last and the hooks in which this segment terminates, the edge is beset with numerous small spines, the inferior six or seven being much the largest.

I have named this *Daphnia* after my late friend Mr. George Newport, to whom I am indebted for the specimens sent to me several years ago.

*Hab.* India.

#### 4. DESCRIPTION OF SOME NEW SPECIES OF INTESTINAL WORMS (ENTOZOA) IN THE COLLECTION OF THE BRITISH MUSEUM. BY W. BAIRD, M.D., F.L.S.

##### Order NEMATOIDEA.

###### 1. ASCARIS SALVINI.

Head naked; the valves of the mouth very prominent. Body cylindrical, unequally attenuated at the two extremities, the tail being considerably more slender than the anterior extremity, which is obtuse. The body is of a ferruginous colour, and surrounded with very distinct striæ; striæ strong, about half a line apart from each other.

Length about  $2\frac{1}{2}$  inches. The only specimen found is a female.

This species differs from *Ascaris inflexa*, to which it is nearly allied, by the head being more obtuse, and the anterior extremity altogether less attenuated; the striæ are very much stronger and more distant from each other; the valves of the mouth are much more strongly developed and prominent.

*Hab.* Found on the outside of the intestines of the *Oreophasis derbianus* of Guatemala.

This rare bird formed part of the collection made in Guatemala by Mr. Salvin. I have, accordingly, dedicated this species of *Ascaris* to him.

## 2. ASCARIS OBCONICA.

Head naked; valves of the mouth small but projecting. Body of male slender for three-fourths of its length, then rapidly becoming thicker till within a line or two of the extremity, which is blunt, straight, or only slightly inflexed, and terminating in a little papilla. The skin is strongly striated. Male spicula within half a line of posterior extremity. Colour of body slightly yellow, or light straw.

Length (male, largest specimen) 2 inches.

*Hab.* Intestines of a Freshwater Snake, *Uranops angulatus*, from Brazil. For this species I am indebted to Mr. Edward Gerrard of the British Museum.

## 3. ASCARIS BODDAËRTII.

Head naked; valves of mouth distinct, large, somewhat triangular in shape. Body narrower at the anterior extremity, thicker towards the centre, and becoming narrower again at posterior extremity. Skin slightly striated; striæ rather distant. Lines on the two sides of the body very distinct. Anus nearly terminal. Colour yellowish, or a deep straw-colour.

Length of body (a female) 4 inches.

*Hab.* Intestines of *Herpetodryas boddaërtii*, a snake from the West Indies. For this species I am indebted to Dr. A. Günther.

## 4. GORDIUS FULGUR.

Among the various objects brought to this country and collected by Mr. R. Wallace, was a species of *Gordius*, of which he gives the following account:—"This curious *Annelid* is found on the ground in the forests of Batchian, twisted among dead leaves or twigs. It glides slowly, has no perceptible head or mouth, but resembles exactly a smooth circular thread of india-rubber, the thickness of a very fine violin-string. It is called by the natives 'Ular langit,' (*lightning-snake*)."

One of the specimens measured  $41\frac{1}{2}$  inches in length; a second  $54\frac{1}{2}$  inches. After being immersed for some time in spirits (the specimens arrived dry and twisted round a piece of stick), they present the appearance of a twisted piece of copper wire, indistinctly striated across, and with a dark streak running down the centre throughout its whole length. This *Gordius* feels to the touch exceedingly slippery, like a piece of recent sea-weed. It is slightly more attenuated at the anterior than the posterior extremity. In all probability it is of a cylindrical form like other *Gordii*; but, owing to the way in which it was sent to this country, it is at present of a rather flattened form.

I have named it *Gordius fulgur* from its native name of *Lightning-Snake*.

*Hab.* Forests of Batchian; probably a native, in its immature state, of some large insect.

## Order CESTOIDEA.

## 5. TETRABOTHRUM GERRARDII.

The genus *Tetrabothrium* was indicated by Rudolphi in his 'Synopsis Entozoorum,' for containing those species of *Bothriophalus* which possess four bothria. It was afterwards fully adopted and characterized as a distinct genus by Diesing; and nine species are described by him. These were discovered all inhabiting the intestines of certain Mammalia, Birds, and marine Fishes; but none of them have been, till now, recorded as living in Reptiles.

The species now to be described, however, was found, by Mr. Edward Gerrard of the British Museum (to whom I am indebted for an opportunity of describing several new species of Entozoa), in the intestines of a *Boa constrictor* from South America.

The head is large, tetragonal; the four bothria disposed crosswise, joined by the margins; each of them large, round, and having on one side a strong ridge. Body depressed, narrow, articulated. No distinct neck. Anterior extremity of body very narrow, and the articulations there are extremely small, becoming larger as they descend, the inferior being quadrangular and rather large. The margins of the articulations somewhat annulated, but having no appearance of genital apertures. The head is about three-fourths of a line broad; but I could not discover any mouth. Apparently only fragments of these worms were obtained; but some of these detached pieces were about 18 inches in length.

*Hab.* Intestines of *Boa constrictor*.

## 5. A COMMENTARY ON M. DESHAYES'S REVISION OF THE GENUS TEREBRA. BY LOVELL REEVE, F.L.S., ETC.

In the 'Proceedings' of the Society for last year, pp. 270-321, is a paper by M. Deshayes, entitled "A general Revision of the genus *Terebra*." Though most carefully elaborated, M. Deshayes was induced to undertake the revision of this genus of pectinibranchiate mollusks under circumstances hardly favourable to the correct discrimination of the species. Specimens of apparently new forms of shells were transmitted to him in Paris from the Cumingian collection, and they were described in the 'Journal de Conchyliologie' as new, without having been submitted to the test of a comparison with the types of previously described species, most of which were known only in this country.

Many of M. Deshayes's new species of *Terebra* have been described already; and many have been described by him as new, which a more extended series of specimens would have shown him to be merely varieties.

Out of 221 species of *Terebra* cited by M. Deshayes in his "General Revision," I have been so fortunate as to collect undoubted types of 214. M. Deshayes has himself generously sent me the types in his own very interesting collection. The remainder are



from the collections of Mr. Cuming, Dr. Gray, Mr. Taylor, Mr. Metcalfe, M. Crosse, and M. Lorois, and two are in the British Museum. The seven alleged species of which I have not obtained the types are three described by Mr. Hinds, which appear either to be lost or transferred to other species, and four described by Philippi in the 'Zeitschrift für Malacologie.' These 214 species I reduce (in my monograph of the genus in 'Conchologia Iconica,' where all the specimens are figured) by rejecting 65 as synonyms; and the number, thus reduced to 149, I bring up to 155 by describing six species which appear to me to be really new.

M. Deshayes, in his paper, described 93 species as new; of these I reject 41. The following is a list of the whole 69 which, I submit, are merely varieties, or duplicates, of species already described. The numbers which follow are those of M. Deshayes's list.

3. *T. nodoso-plicata*, Dunker, variety of *T. cosentini*, Philippi.
6. *T. fimbriata*, Deshayes, variety of *T. crenulata*, Lamarck.
9. *T. patagonica*, D'Orbigny, the same as *T. gemmulata*, Kiener.
12. *T. reevei*, Deshayes, variety of *T. duplicata*, Linnæus.
16. *T. fatua*, Hinds, a bleached state of *T. cingula*, Kiener.
17. *T. festiva*, Deshayes, young of *T. senegalensis*, Lamarck.
18. *T. speciosa*, Deshayes, young of *T. senegalensis*, Lamarck.
23. *T. eburnea*, Hinds, variety of *T. affinis*, Gray.
31. *T. splendens*, Deshayes, variety of *T. dimidiata*, Lamarck.
33. *T. glabra*, Deshayes, a bleached *T. consors*, Hinds.
37. *T. crassula*, Deshayes, variety of *T. hastata*, Gmelin.
43. *T. albulata*, Menke, variety of *T. hastata*, Gmelin.
44. *T. incolor*, Deshayes, a bleached *T. hastata*, Gmelin.
45. *T. casta*, Hinds, variety of *T. hastata*, Gmelin.
47. *T. bipartita*, Deshayes, variety of *T. hastata*, Gmelin.
52. *T. lactea*, Deshayes, a bleached *T. bacillus*, Deshayes.
54. *T. mera*, Hinds, variety of *T. hastata*, Gmelin.
55. *T. verreauxi*, variety of *T. strigilata*, Linnæus.
56. *T. argenvillii*, Deshayes, variety of *T. strigilata*, Linnæus.
58. *T. acumen*, Deshayes, variety of *T. strigilata*, Linnæus.
59. *T. concinna*, Deshayes, variety of *T. strigilata*, Linnæus.
60. *T. matheroniana*, Deshayes, variety of *T. aciculina*.
64. *T. modesta*, Deshayes, variety of *T. strigilata*, Linnæus.
66. *T. bourguignati*, the same as *T. plumbea*, Quoy.
67. *T. crossei*, Deshayes, variety of *T. venosa*, Hinds.
73. *T. jamaicensis*, Adams, the same as *T. cinerea*, Born.
74. *T. stylata*, Hinds, variety of *T. cinerea*, Born.
75. *T. luctuosa*, Hinds, variety of *T. cinerea*, Born.
76. *T. laurina*, Hinds, variety of *T. cinerea*, Born.
77. *T. castanea*, Kiener, variety of *T. cinerea*, Born.
79. *T. adansonii*, Deshayes, variety of *T. micans*, Hinds.
80. *T. inconstans*, Hinds, variety of *T. aciculina*, Lamarck.
81. *T. anomala*, Gray, variety of *T. aciculina*, Lamarck.
86. *T. lamarekii*, Kiener, variety of *T. duplicata*, Linnæus.
93. *T. plicatella*, Deshayes, variety of *T. nitida*, Hinds.

100. *T. subnodosa*, Carpenter, variety of *T. variegata*, Gray.  
 101. *T. hindsii*, Carpenter, variety of *T. variegata*, Gray.  
 102. *T. rufocinerea*, Carpenter, variety of *T. rudis*, Gray.  
 103. *T. albocincta*, Carpenter, variety of *T. variegata*, Gray.  
 104. *T. chilensis*, Deshayes, variety of *T. gemmulata*, Kiener.  
 108. *T. geminata*, Deshayes, variety of *T. spectabilis*, Hinds.  
 109. *T. marginata*, Deshayes, variety of *T. variegata*, Gray.  
 115. *T. crenifera*, Deshayes, variety of *T. cingulifera*, Lamarck.  
 125. *T. approximata*, Deshayes, variety of *T. undulata*, Gray.  
 129. *T. undatella*, Deshayes, variety of *T. cancellata*, Quoy.  
 130. *T. bermonti*, Lorois, the same as *T. pertusa*, Born.  
 133. *T. albicostata*, Reeve, variety of *T. armillata*, Hinds.  
 141. *T. petiveriana*, Deshayes, variety of *T. aspera*, Hinds.  
 142. *T. glauca*, Hinds, variety of *T. aspera*, Hinds.  
 144. *T. peasii*, Deshayes, variety of *T. puncticulata*, Deshayes.  
 148. *T. intertincta*, Hinds, variety of *T. variegata*, Gray.  
 158. *T. cinctella*, Deshayes, variety of *T. picta*, Hinds.  
 159. *T. areolata*, Reeve, variety of *T. columellaris*, Hinds.  
 177. *T. incomparabilis*, Deshayes, variety of *T. flammea*, Lamarck.  
 181. *T. insignis*, Deshayes, variety of *T. lingualis*, Hinds.  
 183. *T. hupei*, Lorois, the same as *T. variegata*, Gray.  
 186. *T. scabrella*, Lamarck, variety of *T. myuros*, Lamarck.  
 189. *T. chinensis*, Deshayes, variety of *T. cingulifera*, Lamarck.  
 192. *T. virginea*, Deshayes, a bleached *T. consors*, Hinds.  
 195. *T. columnaris*, Deshayes, variety of *T. cingulifera*, Lamarck.  
 197. *T. pallida*, Deshayes, variety of *T. cingulifera*, Lamarck.  
 201. *T. regina*, Deshayes, variety of *T. corrugata*, Lamarck.  
 209. *T. bitorquata*, Deshayes, variety of *T. corrugata*, Lamarck.  
 211. *T. loroisi*, Deshayes, young of *T. oculata*, Lamarck.  
 214. *T. decorata*, Deshayes, the same as *T. tessellata*, Gray.  
 216. *T. archimedis*, Deshayes, variety of *T. funiculata*, Hinds.  
 218. *T. circinata*, Deshayes, variety of *T. straminea*, Gray.  
 219. *T. acuta*, Deshayes, variety of *T. straminea*, Gray.  
*T. loroisi*, Guérin-Ménéville, the same as *T. robusta*, Hinds.

This addition to the list of synonyms of *Terebra* results partly from a want of acquaintance with the types of established species, partly from the want of a consideration of the difference between characters truly specific and characters which are modifications arising out of correlation of growth.

## 6. DESCRIPTION OF A NEW GENUS AND SPECIES OF MOLLUSK.

BY HENRY ADAMS, F.L.S.

Genus ALCIRA, H. Adams.

*Testa fusiformis, tenuis, spira elevata; anfractibus transversim striatis. Apertura ovalis, longior quam lata: columella antice truncata et plica obliqua instructa; labro tenui, intus lævi, postice expanso, antice ad marginem crenulato.*





C. H. Ford

W. West

1. *Thamnocenchris aurifer*  
2. *Hyla holochlora*.

Shell fusiform, thin, spire produced; whorls transversely striated. Aperture ovate, longer than wide; columella truncate, and with a single oblique fold anteriorly; outer lip thin, smooth internally, expanded at the hind part, and with the anterior margin crenulated.

ALCIRA ELEGANS, H. Adams.

*A. testa elongata, rufo-fusca; anfractibus 6, convexiusculis, transversim striatis (striis ad basin ultimi anfractus pluribus et profundioribus), maculis nigrioribus, at prope suturam pallidioribus; apertura et spira pari longitudine.*

Shell elongate, reddish-brown; whorls six, slightly convex, transversely striated (the striæ stronger and more numerous on the basal portion of the last whorl), variegated with darker markings, and with some lighter spots next the suture; aperture equalling the spire in length.

Long.  $7\frac{1}{2}$  lin.

*Hab.* Natal.

This genus appears to belong to the *Columbellinæ*, in some of which a similar fold exists upon the columella; but the absence of any thickening or dentition of the outer lip, and its being expanded, distinguish *Alcira* from all the groups at present included in that subfamily. The shell has been recently obtained from Natal by Hugh Cuming, Esq., of whose extensive collection it now forms a part.

7. ON THE REPTILES OF GUATEMALA. BY OSBERT SALVIN,  
M.A., F.Z.S.

(Reptilia, Pl. XXXII.)

There is perhaps no portion of the two continents of America where an accurate record of the localities in which collections have been made is of such importance as in that long isthmus of varying width which joins the mainlands in the northern and southern hemispheres. It is neutral territory, on which the faunæ and floræ of the north and south contend for superiority in the forms of animal and vegetable life which give character to the respective regions. That portion of this isthmus to which I now particularly refer is the Republic of Guatemala, which, with British Honduras and Yucatan, includes within the definite limits of the isthmus of Tehuantepec and the comparatively narrow neck of land lying between the bottom of the Bay of Honduras and the Pacific Ocean a very considerable portion of the whole. Though the forms of life inhabiting the district thus defined lean decidedly to Neotropical types, yet there are just sufficient genera and species of Nearctic forms to render the consideration of the localities of observed species a matter of great moment in accurately defining the boundary between the two great zoological

provinces of the New World. Though this boundary must be sought for further to the northward, we yet find in Guatemala a *Sorex* among mammals, the great mass of the *Mniotiltidæ* among birds, *Tropidonotus* and *Ischnognathus* among snakes, and *Rana* among frogs.

It must not be supposed that a definite boundary line, beyond which the species of *either* region do not pass, can ever be drawn between these two or any two zoological provinces. The real division will probably prove in this case to extend over a wide tract of country, and to occupy a position within certain limits, which include a district inhabited by forms to be considered as typical of each; the true boundary being that portion of such a district where the typical forms of each are found in equal numbers.

In making such a comparison, it is evident that forms that are common to the two regions, as well as such as inhabit exclusively the district in question, need not be taken into consideration. Thus viewing the list I give below, we find the southern genera considerably predominating over the northern. Taking the genera of snakes peculiar to the south, we have *Homalocraniion*, *Tomodon*, *Spilotes*, *Dromicus*, *Ahaetulla*, *Leptodeira*, and *Dipsas*; while the only genera peculiar to the north are *Ischnognathus* and *Tropidonotus*. Those common to the two continents are *Herpetodryas*, represented by the northern *H. flavogularis*, and by the southern *H. rappii*, *H. boddaertii*, and *H. brunneus*; and *Elaps*, represented by *E. corallinus* and *E. fulvius*. Of these, *Elaps* is hardly to be called a typical northern form, as it does not range far into the United States. The genera found in Guatemala, and not elsewhere in the Americas, are *Streptophorus* (*S. sebæ*) and *Dipsadomorphus* (*D. biseutatus*).

Of Batrachians, the North American genus *Rana* occurs, but no Tailed Batrachians: *Bufo nebulifer* is found at Dueñas, *Bufo aquia* in Vera Paz, *Engystoma carolinense* at Coban, and *Rana halecina* everywhere. Of Lizards, *Basiliscus* and *Corythophanes* occur at Lanquin, the former in abundance; they are also both found sparingly at Dueñas. *Tropidolepis* and *Cnemidophorus* occur both at Dueñas and Coban.

Again, referring to the division between the Nearctic and Neotropical regions, it appears certain that the northern forms extend far further to the southward along the table lands than along the hot districts of either seaboard; and again, the southern forms range farther to the northward along the coasts than along the table lands. In Guatemala the "tierra caliente" seems, *with very few exceptions*, to embrace purely Neotropical types; whereas on the table lands and the more elevated and temperate districts only, all the North American genera and species that are to be found in the country occur.

Besides the Snakes enumerated below, there is a Rattlesnake (*Crotalus*) found in many parts, specimens of which I did not obtain. There is also a *Cenchrus*, probably *C. piscivorus*, a fine example of which was one day brought to me by an Indian; but being too

large to be put into my bottle, I hung it up and left it till the following morning, intending to skin it. When I went to look for it at daylight, it was nowhere to be seen. The Indians said a dog had probably eaten it.

The principal places in the neighbourhood of which I collected during my stay in Guatemala last year and the early part of the present were Dueñas, Coban, and Lanquin. The former village is situated between the volcanos of Agua and Fuego, on an offshoot of the table lands. It is elevated about 4700 feet above the level of the sea. Coban, in Vera Paz, stands at an elevation of 4500 feet, on some broken and undulating ground, shut in on three sides by mountains. Its position is somewhat peculiar, being isolated in its temperate climate from the table lands by having on all sides a "tierra caliente," its only connexion with the back bone of the Cordillera being a tortuous and narrow ridge of mountains. Lanquin, though only about thirty-five miles to the eastward of Coban, is quite in the hot district. It lies in a hollow surrounded by high mountains. Here it was that most of the Tropical species were collected.

In collecting I received great assistance from Mr. Robert Owen of San Gerónimo, who secured for me many specimens at Coban while I was absent in the mountains, and also made several additions at San Gerónimo before forwarding my last collection to England.

The synonymy of each species I take from Dr. Gray's and Dr. A. Günther's Catalogues of the Reptiles in the Collection of the British Museum. I must add, that I have had the full benefit of Dr. Günther's great knowledge of this subject. Both in determining the species and in the remarks upon them, I have largely availed myself of his suggestions.

#### BASILISCUS AMERICANUS, Laur.

This Basilisk is very common at Lanquin, where I had no difficulty in obtaining plenty of specimens of both sexes and all ages, by offering the Indians a small reward for all they brought. They may frequently be seen on the low branches of a bush, and are particularly fond of basking on the boughs of a felled tree in a clearing near a stream. When running fast, they carry the tail slightly elevated. At Dueñas this species is more rare; I saw but three or four specimens, and only succeeded in securing one. In some specimens of the males, the tail is much more compressed than in others. In the series of young the crest is shown in all stages of development.

#### CORYTHOPHANES CRISTATA, Boie.

*Agama cristata*, Merrem.

Is not nearly so numerous as the Basilisk. I obtained but one specimen, which was brought to me at Lanquin.

#### ANOLIS SALLÆI, Günther, P. Z. S. 1859, p. 421.

I obtained two specimens of this *Anolis* at Dueñas.

**ANOLIS FRASERI**, Günther, P. Z. S. 1859, p. 407.

Coban ; several specimens. All the examples of both these species of *Anolis* are immature.

**TROPIDOLEPIS TORQUATUS**, Gray.

*Agama torquata*, Wieg. Herpet. Mex. p. 49. pl. 7.

By far the commonest Lizard in the country, and very generally distributed. The colouring appears to vary considerably in different individuals, as has been stated by Wiegmann. In some the blue of the under parts is barely traceable, nor is the black collar round the neck shown. In others these are very decidedly defined, while some have in addition a reddish-yellow crescent-shaped mark on the lower part of the chin. They are found usually about walls and hedge-rows.

**CNEMIDOPHORUS UNDULATUS**, Wieg. Herpet. Mex. p. 27.

This is also a common species, but not so abundant as *T. torquatus*. I found it at Dueñas, Coban, and Lanquin. This Lizard also exhibits a great diversity of colouring on the flanks. The shields of the head become very irregular in some of the older examples, and assume a tubercular appearance.

**GERRHONOTUS WIEGMANNI**, Gray, Cat. of Lizards, p. 54.

Not at all common. A single specimen obtained at Lanquin was the only one that came under my notice : this I caught on the convent wall. It was shown me by the priest, who said that he had noticed it on the same spot several nights in succession.

**TYPHLOPS TENUIS**.

Eyes imperceptible ; tail exceedingly short, obtusely conical, scarcely bent downwards. Middle of the trunk surrounded by seventeen series of scales. Nasal shields reaching as far backwards as the rostral shield ; two more shields behind the nasal. The length of the body 6.4 times the diameter of the girth. Each scale on the back brown, with lighter margin ; belly dirty whitish.

Length 12 inches ; length of the tail  $1\frac{3}{4}$  line.

*Hab.* Coban in Guatemala.

One specimen of this apparently new *Typhlops* was brought to me at Coban by an Indian boy.

**STREPTOPHORUS SEBÆ**, Dum. et Bibr.

Very abundant at Coban, being found in the grass growing on each side of the streets.

One specimen is variegated, black and dirty white beneath.

**HOMALOCRANION ATROCINCTUM**, Dum. et Bibr.

*Calamaria atrocincta*, Schleg.

One specimen was killed at Dueñas among some logs of wood.



This example was very brilliantly painted, the white rings of the specimen in spirits were in life deep flesh-colour.

**CORONELLA DECORATA**, Günther, Cat. of Col. Snakes, p. 35.

One specimen was brought to me from the Volcan de Fuego. The under surface of this when fresh was ochreous yellow. It differs, moreover, from Dr. Günther's description in not having the yellow spots on the side of the head and the yellow band on the anterior part of the trunk.

**TOMODON LINEATUS.**

*Tomodon lineatus*, Dum. et Bibr. vii. p. 936. pl. 73.

A single specimen of this rare snake was taken at Dueñas by an Indian. There are probably but two other specimens known in collections.

The genus *Tomodon* appears to belong chiefly to Central America, *T. lineatus*, being found in Mexico and Guatemala, *T. strigatus*, Günther, on the island of Laguna, whilst *T. dorsatus*, the species nearest allied to *Xenodon*, extends southwards as far as Rio Janeiro. Dr. Günther has referred this species to the genus *Psammophis*; but its natural affinities point rather to *Dromicus lineatus*. It seems to be an intermediate form between those genera.

**TROPIDONOTUS ORDINATUS**, Linn.

The specimens collected by myself at Dueñas either have the stripes not very conspicuous, with the intervals unspotted, and without occipital spots, or the stripes are very conspicuous, with intervals spotted with black on the anterior part of the trunk, and occiput without spots. They are to be referred to *T. ordinatus*, Linn., and *T. sirtalis*, Linn. A single specimen was brought to me at San Gerónimo, which does not quite agree with any of the numerous varieties of this Snake described by the North American Herpetologists as so many species. The scales are in nineteen rows; and there is one anterior, and on one side three and the other four posterior oculars. The scales are brown, except those forming the vertebral series and those of the three outer series, which with the ventral plates are yellowish olive. There are two alternate series of square black spots, in the intervals between the dorsal and lateral stripes, more strongly defined on the anterior part of the body, whilst they are more irregular and intermixed with yellowish olive spots on the posterior parts. The black spots, as well as the olive ones, are on the skin rather than on the scales. A series of black dots accompany the lateral stripe. There is a well-defined black collar on the neck. The scales on the tail are very strongly keeled.

At Dueñas this species is exceedingly common about the rushy margin of a small lake. Numbers may be seen on a sunny day basking among the reeds on the edge of the water, into which they dart on being alarmed.

## ISCHNOGNATHUS DEKAYI, Dum. et Bibr.

*Tropidonotus dekayi*, Holbr.

Two specimens of this small Snake were brought to me at Coban by the Indians. The other species of this limited genus, *I. occipitumaculatus*, I never met with. It seems to have a more northern range.

## SPILOTES CORAIS.

*Coluber corais*, Cuv.*Spilotes corais*, Dum. et Bibr. p. 222.

Dueñas and Lanquin, not uncommon. The specimens which I collected belong to the Mexican variety described by Duméril as *Spilotes melanurus*.

## HERPETODRYAS BODDAERTII.

*Coluber boddaertii*, Seetzen in Meyer's Archiv, ii. p. 59.*Herpetodryas boddaertii*, Schleg.

Two specimens from Dueñas were brought to me by the Indians. These examples have a dark streak down the centre of the back, and two paler lateral streaks, constituting a very marked variety. They do not, however, differ in other respects.

## HERPETODRYAS BRUNNEUS, Günther, Cat. Col. Snakes, p. 116.

I picked up a specimen of this Snake on the road between Coban and Lanquin. It had been killed by some Indians passing. Another was sent to me by Mr. Owen from San Gerónimo. In life the upper parts are grass-green, not brown as in the description. This colour disappeared almost immediately after the specimen was put into spirits. I believe it is known as a fact, that the green snakes become blue in spirits. This appears an exceptional case; for the skin is blue, while the epidermis has become brown.

## HERPETODRYAS RAPPPII, Günther.

One specimen, a young one, was caught under the wall of a house in Dueñas.

## HERPETODRYAS FLAVIGULARIS.

*Psammodphis flavigularis*, Hallow. Proc. Ac. Nat. Sc. Philad. 1852, p. 178.

*Herpetodryas flavigularis*, Günther.

One specimen, a very large one, but a good deal injured, was sent to me by Mr. Owen from San Gerónimo. I took a rat from the stomach.

## DROMICUS MARGARITIFERUS.

*Herpetodryas margaritiferus*, Schleg, Ess. ii. p. 184.*Dromicus margaritiferus*, Günther.

The scales of this species are in life decidedly bluish with a black

margin. It is common at Dueñas, where several specimens were brought to me by the Indians. I also obtained two examples at Lanquin. It seems to be generally distributed. If at some future period more stress is laid on the character of coloration, this species will form the type of a separate genus, as the other species constituting the genus *Dromicus* exhibit a very decided tendency to longitudinal bands.

#### AHÆTULLA MEXICANA.

*Leptophis mexicana*, Dum. et Bibr. vii. p. 53.

*Ahætulla mexicana*, Günther.

One specimen from Lanquin. This is a very beautiful species when fresh, the upper part being deep bluish-green.

#### LEPTODEIRA ANNULATA.

*Coluber annulatus*, Linn.

*Leptodeira annulata*, Fitzinger, Syst. Rept. p. 27.

One specimen (scales in twenty-three rows), killed in the thatch of a rancho near Dueñas.

#### DIPSAS CENCHOA, Linn.

*Coluber cenchoa*, Linn.

*Dipsas cenchoa*, Neuwied.

One specimen, a small one, from Coban, brought by an Indian boy.

#### DIPSADOMORPHUS BISCUTATUS.

*Dipsas biscutata*, Dum. et Bibr. p. 1153.

*Dipsadomorphus biscutatus*, Günther.

I picked up a dead example (a very large one) of this snake on the road between Coban and Lanquin. It had probably been killed and thrown there by an Indian. There were previously only three specimens known, one having been brought lately by M. Sallé from Oaxaca, which is now in the collection of the British Museum. The present specimen measures at least  $3\frac{1}{2}$  feet.

#### ELAPS CORALLINUS.

I obtained from the Indians two specimens of *Elaps* from Dueñas, one of which seems to agree most nearly with *E. fetzingeri*, Jan., the other with *E. nigrocinctus*, Girard. The former of these has twenty-seven rings on the trunk and six on the tail. The number of ventral plates is 224, of the caudal 37. The black rings are placed at regular intervals. Each ring is narrowly edged with yellow, and the intervals between the rings filled in on the upper surface with dull red, which is darkest on the vertebræ, and gradually becomes lighter towards the flanks. The first ring on the neck commences anteriorly just within the occipital shields. Each black ring occupies a series of six scales. The spaces between the black rings occupy nine series of scales.

The latter has twenty-two rings on the trunk and five on the tail. The number of ventral plates is 221, of the caudal 39. The black rings are equidistant. Each ring is narrowly edged with yellow, the ground colour is dark blood-red, browner on the upper surface, which grows darker towards the centre of the back. The first ring commences anteriorly within the posterior angles of the occipital shields. Each black ring includes a series of six scales, and each interval between the rings mostly includes fourteen scales.

#### ELAPS FULVIUS.

At Lanquin I obtained three specimens of a snake of this genus, which appears to be the *E. aglaope*, Cope. The ground colour of all these is red, darkest on the centre of the back, and the character of the markings is the same. They, however, differ in some respects; and I therefore describe each fully, though without the slightest doubt they belong to the same variety.

No. 1 has forty-one black rings on the trunk and ten on the tail. Between each ring on the trunk is a series of black spots, more or less run together or isolated, and arranged so as to form an irregular line on the upper surface parallel to the rings. On the tail these intermediate markings do not exist. The ring on the neck passes over the head across the posterior margin of the occipital shields in an irregular line, converging anteriorly. A band of black crosses the head, and passing over the posterior frontal and vertical shields converges posteriorly. The rostral and anterior frontal shields are dark reddish-brown. The rings are interrupted in several cases on the belly. The rings include a series of four scales, and the intervals between the bands a series of six. The number of ventral plates is 207, of caudal 51.

No. 2 is coloured exactly as the preceding; but the rings are less frequently interrupted, and the intermediate markings assume more decidedly the form of a ring. The black rings are forty-five in number on the trunk, and nine on the tail. The ring round the neck passes behind the occipital shield, but has a square marking extending partially over those shields; a marking passes over the frontal superciliary and vertical shields, but not quite to the lower margin of the labials. The black rings include a series of three scales, and the intermediate spaces six. The number of ventral plates is 224, of caudal 40.

No. 3. The rings of this specimen are very much interrupted, and the intermediate markings very irregular. The number of rings is forty-three on the trunk, and on the tail twelve. The ring round the neck is the same as in the other specimens, having its anterior edge passing over the occipital shields in an irregular line. The marking on the anterior part of the head extends to the lower labials. The rings include three scales, and the intervals between the rings five; these, however, vary much. The number of ventral plates is 212, of caudal 55.

It certainly appears somewhat remarkable that I should have found the northern form *E. fulvius* in the hot district of Lanquin, and the southern *E. corallinus* at Dueñas, in the temperate region of the

Table lands. The reverse might certainly have been expected. But then the question arises, Are these two, *E. fulvius* and *E. corallinus*, really distinct species? The basis of the distinction seems to be laid entirely on the coloration, as no structural differences are traceable. It is true that the two, as I have given them above, represent great diversity in the number of the rings; but this inequality, being so noticeable in specimens that are certainly of the same species, seems to resolve itself into merely one of amount. The manner of arrangement is precisely the same in both, the series of rings being *equidistant* in both the species under consideration. If, then, we reject the number of rings as an insufficient ground for specific distinction, the other differences, such as the yellow bands and the intermediate black markings, can hardly be considered as such when no two specimens are exactly alike. The inequality existing in the number of the ventral plates and the proportion they bear to the caudal is such, that, if any one of the five specimens I have described be entitled to bear a specific appellation, so are they all.

Besides the great variation shown by my specimens, an examination of the series in the British Museum at once indicates that the great difference between extreme varieties can be filled in by an almost consecutive series of minor distinctions. Nor can these varieties be classed under the head of local varieties, and thus substantiate a title to specific distinction. In the present instance we find three, all of which bear separate names, inhabiting the same country. The deduction that *Elaps corallinus* and *E. fulvius*, and all the varieties which have been collected under each of these heads, belong in reality to one highly variable species, seems inevitable.

#### THAMNOCENCHRIS, n. g. (CROTALIDÆ.)

A pit on each side of the face. Posterior part of the body and tail much compressed, the latter ending in a horny spine. Subcaudals one-rowed. Tail prehensile. Head angular, anteriorly covered with irregular shields, and having small keeled scales posteriorly. No small scales between the superciliary and the orbit. The second upper labial forms the anterior part of the facial pit.

#### THAMNOCENCHRIS AURIFER, sp. n. (Pl. XXXII. fig. 1.)

Scales keeled in nineteen rows. Nine upper labial shields. Small shields between the fourth labial and the orbit. Green, with a dorsal series of orange spots edged with black. A black band from the orbit to the side of the occiput.

*Hab.* Coban, Vera Paz.

This new form is distinguished from *Teleuraspis* (Cope) by its peculiarly compressed body and tail, the latter being coiled as in some of the *Boidæ*, clearly indicating a habit of living in trees. It also differs from *Botriechis*\*, Peters, in having very large shields instead of very small scale-like ones on the upper surface of the snout. Nor does Prof. Peters mention in his description the pecu-

\* Monatsb. Akad. Wiss. Berlin, 1859, p. 278.

liarily compressed tail, the most striking character of the present genus. The general form of the head is similar to that of *Cenchrus*, which it moreover resembles in having the anterior portion of the upper surface of the head covered with irregular shields of moderate size. Nostril in the middle of a single plate. Upper labials nine, the third, fourth, and fifth of which are the largest. There are about seven small shields between the orbit and the fourth and fifth. From the superciliary backwards the head is covered with keeled scales. Scales of the body keeled in very oblique series. 154 ventral shields; anal entire; 53 caudal shields. Posterior ventral shields extend very far up the sides. Colour green, paler and yellower below. A series of about thirty-five small golden-yellow spots runs along the back to the tail, where they become more irregular; each spot has a black edge posteriorly. The upper surface of the head is uniform dull green, bordered on each side by a black stripe proceeding from the eye to the side of the occiput. Length of the head 1 inch 4 lines; of the trunk 2 feet 3 inches; of the tail 6 inches.

A single specimen only of this new species was preserved for me at Coban by Mr. Owen while I was away in the mountains of Lanquin. It had been brought to him by an Indian.

#### RANA HALECINA, Kalm.

Common throughout Guatemala. It was the only species of *Rana* I met with. At Dueñas the Indians catch them to eat, spearing the larger ones and netting the larvæ.

#### ENGYSTOMA CAROLINENSE, Holbr.

Exceedingly common at Coban. In the day time they hide under stones and pieces of wood. About half the specimens I obtained have a fold in the skin across the occiput; the rest are without it. This character therefore cannot be considered of specific value.

#### BUFO AGUA, Latr.

Very abundant at Lanquin and also at Coban, but the specimens from the latter place seem to be smaller. Though numbers were brought to me, there was not a single large one among them. This species reaches its maximum development in the hottest parts of Brazil. It seems to diminish in size in more temperate regions.

#### BUFO NEBULIFER.

*Bufo granulatus*, Baird & Girard, Proc. Ac. Phil. 1852, p. 173.  
*Bufo nebulifer*, Girard, Proc. Ac. Phil. 1854, p. 87.

Very abundant at Dueñas, where they are to be found under stones and logs of wood. After dark they come out of their hiding places and may be seen hopping about in all directions. It is a species peculiar to Central America and Mexico.

#### HYLA HOLOCHLORA, sp. n. (Pl. XXXII. fig. 2.)

Vomerine teeth in two slightly oblique series, beginning from the

anterior edge of the nostrils and converging posteriorly, more or less interrupted in the middle. Width of the tympanum two-thirds of that of the eye. Skin smooth. Disks of the toes very broad, as large as the tympanum; the three outer fingers almost entirely webbed. Uniform grass-green above, yellow below.

*Hab.* Coban in Guatemala.

Habit that of *H. arborea*. Head broad, with flat crown, rather short muzzle, and rounded canthus rostralis. Eye of moderate size, rather prominent. Tympanum two-thirds the width of the eye, with a small fold behind it. The legs of moderate size, with very large discs, and with the tubercles on the lower part of the feet very well developed. Toes entirely, and the three outer fingers almost entirely, webbed. No fold across the chest. Skin without any appendages. Tongue with a conspicuous notch posteriorly. Male with a single subgular sac. Sacral vertebra considerably dilated. Upper parts uniform grass-green, except the upper arms and thighs, which are colourless. Lower parts yellow. Length of the body of an adult female 3 inches; length of the fore leg 2 inches; length of the hind leg  $4\frac{1}{2}$  inches.

Of this Tree Frog I obtained three examples at Coban, all of which were caught by the Indians. It was the only species I met with.

#### 8. NOTE ON THE *BALÆNICEPS REX*. BY A. D. BARTLETT.

The question of the affinities of the *Balæniceps* having been discussed by so many able ornithologists, it may be interesting to know that this bird does not possess the remarkable patches of down found on each side of the breast in all the Herons and Bitterns.

Having had the opportunity of ascertaining this fact by an examination of the living bird, now in the Society's Gardens, I am enabled to say that these patches (which are of a singular dense and close structure, and are found beneath the feathers on each side of the front and fore part of the pectoral muscles) do not exist in the *Balæniceps*. The absence of this structure may, I think, assist in indicating the true affinities of this bird, as pointed out by Dr. Reinhardt in his communication to the Society on this subject\*.

#### 9. CHARACTERS OF TEN NEW SPECIES OF AMERICAN BIRDS. BY PHILIP LUTLEY SCLATER, SECRETARY TO THE SOCIETY.

##### 1. *CAMPYLORHYNCHUS NIGRICEPS*.

*Supra fulvo-rufescens nigro transfasciatus: pileo toto nigro: superciliis elongatis rufescenti-albidis, striga post-oculari nigra subtus limbatis: alis nigris, harum tectricibus fulvo extus lim-*

\* See *antea*, p. 377.

*batis, remigibus autem in pogonio externo maculis ovalibus fulvis quater transfasciatis: cauda nigricante, rectricum pogoniis externis et harum extimarum pogoniis internis obsolete fulvo transvittatis: subtus albidus, abdomine rufescente: rostro pedibusque corneis, illius culmine nigricante.*

Long, tota 6·5, alæ 3·1, caudæ 3·2, rostri a rictu 1·0, tarsi 1·0.

*Hab.* In prov. Veræ Crucis Mexicana.

I possess two examples of this species of *Campylorhynchus*, one obtained by one of M. Sallé's correspondents at Orizaba, and the other from Señor de Oca's series collected at Jalapa. The latter is manifestly in immature plumage. I have until recently considered that they might perhaps be referable to an immature dress of *C. capistratus*, but such cannot be the case. The black head is distinctly marked in both of my examples; but there is no trace of the characteristic deep rufous nape and upper back of *C. capistratus*, or of the white termination to the black rectrices. The body is quite unspotted below, traces of blackish edgings to the feathers being apparent only in the younger specimen; while in *C. capistratus*, junior, there are decided round black spots. Though I should wish to examine further examples of *C. nigriceps*, I can entertain no doubt of its distinctness from other known Mexican species of the genus.

## 2. *CAMPYLORHYNCHUS GULARIS*, sp. nov.

*Supra brunneus, plumis omnibus nigro ocellatis, et medialiter allostriatis: pileo toto et nucha brunnescenti-rufis unicoloribus: superciliis latis et elongatis albis, striga post-oculari et altera rictali utrinque nigricantibus: alis pallide nigricantibus, harum tectricibus sicut in dorso maculatis, remigibus autem solum in pogonio externo maculis pallide brunneis regulariter transvittatis: cauda nigricante, margine lato apicali albo: rectricibus quatuor intermediis pallido brunneo et nigricante omnino tessellatis, proximis duabus in pogonio exteriore albido maculatis, duabus utrinque extimis in utroque pogonio maculis magnis albis notatis: subtus lactescenti-albus, ventre rufescente: gula immaculata; ventre præcipue laterali maculis rotundis nigris asperso: rostro brevi plumbeo: pedibus pallide corneis.*

Long. tota 7·0, alæ 2·8, caudæ 2·8, rostri a rictu 0·8, tarsi 0·8.

*Hab.* In Mexico.

*Mus.* P. L. S.

I have a single specimen only of this *Campylorhynchus*, received from Mr. Gould. It belongs to the group with rufous and black heads, containing *C. brunneicapillus*, *C. affinis*, *C. capistratus*, *C. jocosus*, and *C. nigriceps*; but differs from all in its pure wood-brown head, unspotted throat, and very short beak and tarsi. Its nearest ally is *C. jocosus*, but its short bill will at once distinguish it from that species.

## 3. *VIREO MODESTUS*.

*Vireo noveboracensis*, Gosse, B. of Jamaica, p. 192.



*Supra olivaceus ; alis caudaque nigricanti-fuscis, illis albo bifasciatis : fronte et superciliis flavicante vix tinctis : subtus pallide flavicanti-albus : tectricibus subalaribus albis : rostro superiore pallide corneo, inferiore albescente : pedibus plumbeis.*

Long. tota 4·5, alæ 2·3, caudæ 2·0.

*Hab.* In ins. Jamaica.

*Obs.* Similis *Vireoni modesto*, sed fronte aureo caret.

This Greenlet appears to have been taken by Gosse for the *Vireo noveboracensis* of the United States and Mexico, from which it may be immediately distinguished by the absence of the golden-yellow colour of the front and lores. It is also not so brightly coloured on the sides of the belly. Mr. Gosse informs us that it is resident all the year round in the island. One example of this bird in my possession is from Mr. Gosse's original collection. A second has been recently presented to me by J. H. Gurney, Esq., M.P., who received it from Jamaica; and I have lately obtained a third.

I was at first suspicious that this bird might be identical with Cabanis's *Vireo gundlachii* of the island of Cuba; but having forwarded one of my specimens to Dr. Hartlaub for comparison with examples of the Cuban species in the Museum at Bremen, I have ascertained through his kindness that such is not the case. In the size of the first spurious primary and the general conformation of the wings, *Vireo modestus* resembles *Vireo noveboracensis*.

#### 4. VIREOSYLVA COBANENSIS.

*Vireosylva philadelphica*, Sclat. Ibis, 1859, p. 12 (nec *America-norum*).

*Supra olivaceus, pileo vix cinerascete induto : fronte, superciliis, et regione oculari albicantibus, alis et cauda nigricantibus, olivaceo extus anguste limbatis ; tectricum majorum apicibus albescentioribus : subtus pallide flavus, unicolor, mento albicante ; hypochondriis olivacescentibus ; tectricibus subalaribus pallide flavis : rostro plumbeo, pedibus nigro-schistaceis.*

Long. tota 5·0, alæ 2·5, caudæ 1·75, rostri a rictu ·55, tarsi ·7.

*Hab.* In Guatemala (*Salvin*).

This *Vireosylva* belongs to the section of the genus in which the first primary is altogether absent. The second and third quills are equal in length and longest, the fourth is very little shorter, and the fifth nearly equals the first. The bill is smaller than in *Vireo gilvus*, and somewhat like that of *V. modestus* and *V. noveboracensis*, though more slender and more compressed.

This *Vireosylva* is quite distinct from any species of the genus with which I am acquainted. I have hitherto referred it to *V. philadelphica* of North America—a bird which appeared to approach it in the absence of the first primary, and in the yellow colour of the under-body—but Professor Baird, to whom I have sent examples, informs me that I have been wrong in so doing.

Mr. O. Salvin obtained many specimens of this bird at Coban and Tactic, in the province of Vera Paz, Guatemala, and I therefore propose to call it *Vireosylva cobanensis*.

## 5. MYIOBIUS FLAVICANS.

*Flavicanti-olivaceus, pilei semi-cristati plumis infra rufescenti-aurantiacis; ciliis oculorum pallide flavidis: alis et cauda nigricanti-fuscis, remigum et tectricum alarum marginibus, harum latioribus, extus ochraceo-rufis: subtus valde dilutior, gula albicantiore, ventre crisso et tectricibus alarum inferioribus pallide flavis: remigum marginibus interioribus subtus pallide rufescenti-ochraceis: rostro nigro, pedibus fuscis.*

Long. tota 4·3, alæ 2·6, caudæ 1·9, tarsi 0·7.

*Hab.* In rep. Equatoriali et Nov. Grenad.

*Mus.* P. L. S.

This Tyrant-bird belongs to the crested section of the group which contains *M. ornatus* (Laf.) and *M. phœnicurus*, though its bill is slightly more compressed and less well provided with rictal bristles than in those species. My collection contains two specimens of this bird, one from Pallatanga in Ecuador, collected by Mr. Fraser (no. 1088), and a second received from M. Verreaux, apparently a Bogotan skin. The latter is either a female or young bird, and wants the orange crest.

The wings of this *Myiobius* are rather long, reaching beyond half the length of the tail. The third, fourth, and fifth quills are nearly equal and longest, the second and sixth are of the same length, the first being equal to the eighth and ninth.

## 6. MYIOBIUS PULCHER.

*Olivaceus, pilei semicristati plumis intus aurantiacis; loris albidis; alis nigris albo bifasciatis, tectricum majorum et minorum apicibus necnon secundariorum marginibus externis conspicue albis aut flavicanti-albis: cauda fusca, extus olivaceo limbata: subtus flavus, gutture magis aurantio: tectricibus alarum inferioribus pallide sulphureis: rostro et pedibus nigris, illius mandibula inferiore carnea.*

Long. tota 3·5, alæ 1·9, caudæ 1·6, tarsi 0·55.

*Hab.* In rep. Equatoriali.

*Mus.* P. L. S.

This pretty and well-marked species is allied in structure to the last, but is immediately distinguishable by its diminutive size and double-banded wings. I have two examples of it, both out of a collection received by Mr. Gould from Ecuador, as it is believed, from the eastern slope of the watershed. The third, fourth, and fifth quills are equal and longest, slightly exceeding the second and sixth; the first is rather shorter than the longest secondaries.

## 7. MYIOBIUS CRYPTERYTHRUS.

*Fuliginoso-fuscus, uropygio brunnescentiore; pilei plumis interne rubris; loris albis; alis nigricantibus albo bifasciatis, tectricum majorum et minorum necnon secundariorum marginibus externis fulvescenti-albis: cauda fusca, marginibus pallidioribus: subtus albus lateraliter cinerascens, pectore nigricanti-cinereo*

*flammulato, tectricibus alarum inferioribus albis: rostro et pedibus nigris, mandibula inferiore carnea.*

Long. tota 5·0, alæ 2·5, caudæ 2·3, tarsi 0·7.

*Hab.* In republ. Equator. reg. occidentalibus.

*Mus.* P. L. S.

This *Myiobius* is nearly allied to *M. nævius* (Bodd.) (Pl. Enl. 574, fig. 3) of Brazil, and of the same form and distribution of colours; but it is easily distinguishable by its larger size, sooty colouring above, and red crest. It appears to be common on the western side of Ecuador, examples having been procured by Mr. Fraser at Pallatanga, Babahoyo, and Esmeraldas.

#### 8. MYIOBIUS CRYPTOXANTHUS.

*Fuliginosus, uropygio magis olivaceo; pilei plumis interne flavis: loris albis: alis nigris albo bifasciatis, tectricum majorum et minorum apicibus necnon secundariorum marginibus externis sordide albis: cauda fusco-nigricante, rectricum marginibus externis dilutioribus et harum ipsis apicibus anguste albis: subtus sordide cinereus, gutture albicante, abdomine flavido perfuso; rostro et pedibus nigris illius mandibula inferiore carnea.*

Long. tota 4·5, alæ 2·3, caudæ 2·1, tarsi 0·6.

*Hab.* In rep. Equator.

*Mus.* P. L. S.

This species is closely allied to the preceding, but may be distinguished by its smaller size, shorter bill, yellow hidden crest, and yellowish belly. Its discovery is also due to Mr. Fraser's researches, the only examples of it I have seen having been obtained by him at Gualaquiza and Zamora, in Ecuador. It is included in my list of Mr. Fraser's birds collected in those localities given in our 'Proceedings' for 1859\*, but not named, as I was not then able to determine it satisfactorily.

The *Tyrannidæ* allied to *Muscicapa barbata* of the old authors—the type of Swainson's genus *Tyrannula* (a name which we must replace by Mr. Gray's term *Myiobius* in consequence of its approaching too near to *Tyrannulus*)—appear to me to form a group distinguished by their short flat bills, gay colouring, and hidden bright crests. I possess examples of the following species, which I am inclined to arrange together under one generic name:—

##### a. *Myiobius*.

1. *barbatus* (Gm.): Pl. Enl. 830, fig. 1, ex Cayenna, Nov. Grenada et rep. Equat.
2. *xanthopygius* (Spix): Cab. Mus. Hein. p. 67, ex Brasil.
3. *sulphureipygius*, Selater, P. Z. S. 1856, p. 269.—*M. citrinopygius*, Cab. et Hein. Mus. Hein. ii. p. 67, ex Mexico et Guatemala.
4. *villosus*, Selater, P. Z. S. 1860, p. 93, ex rep. Equat.

\* See P. Z. S. 1859, p. 458, sp. 59\*.

β. *Pyrrhomyias*, Cab. et Hein.

5. *cinnamomeus* (Lafr. et d'Orb.): Cab. et Hein. Mus. Hein. ii. p. 66, ex Nov. Grenad. et rep. Equat.
6. *vieillotides* (!), Lafr. R. Z. 1848, p. 174.—*Pyrrhomyias heinei*, Cab. et Hein. Mus. Hein. ii. p. 66, ex Venezuela.
7. *erythrurus*, Cab. in Wieg. Arch. 1847, p. 249, pl. 5. fig. 1; Sclater, P. Z. S. 1860, p. 295, ex rep. Equat.
8. *ornatus*, Lafr. Rev. et Mag. de Zool. 1853, p. 517; Sclater, P. Z. S. 1854, p. 113, pl. 66. fig. 2, ex Nov. Grenada.
9. *phœnicurus*, Sclater, P. Z. S. 1858, p. 70.—*Tyrannula phœnicura*, Sclater, P. Z. S. 1854, p. 113, pl. 66. fig. 1, ex fl. Napo.
10. *flavicans*, Sclater, ex Nov. Grenada et rep. Equat.
11. *pulcher*, Sclater, ex rep. Equat.

γ. *Myiophobus*.

12. *nævius* (Bodd.), Pl. Enl. 574. fig. 3. — *Musc. virgata*, Gm.—*Myiophobus nævius*, Cab. et Hein. Mus. Hein. ii. p. 69, ex Brasil.
13. *cryptoxanthus*, Sclater, ex rep. Equat.
14. *crypterythrus*, Sclater, ex rep. Equat.

9. HETEROPELMA AMAZONUM, sp. nov.

*Saturate olivaceo-brunneum, subtus dilutius, ventre præcipue cinerascens, alarum remigibus extus rufescente limbatis: rostro nigro, basi mandibulæ inferioris albida: pedibus fuscis.*

Long. tota 6·75, alæ 3·4, caudæ 2·6.

*Hab.* In ripis fl. Huallaga, loco Chamicuros dicto (Hauxwell).

*Mus.* P. L. S.

*Obs.* Assimilis *H. turdinæ* sed statura minore, et vix major quam *H. virescens*.

This *Heteropelma*, of which I possess a single example, collected by Mr. Hauxwell on the Huallaga, is closely allied to *H. turdinum*; but is of a much brighter tinge above, and in size scarcely exceeds *H. virescens*. Its structure is strictly typical.

10. HETEROPELMA FLAVICAPILLUM.

*Cinerascens-olivaceum, pilei medii semicristati plumis, nisi in apicibus, flavis: alis caudaque fuscis olivaceo limbatis: subtus pallide cinereum, gula et ventre medio albicantioribus: tectricibus alarum inferioribus pallide sulphureis: rostro et pedibus nigris.*

Long. tota 6·0, alæ 3·1, caudæ 2·5, tarsi 0·6, rostri a rictu 0·65.

*Hab.* In Brasilia Mer. Or.

*Mus.* P. L. S.

I have long had Brazilian specimens of this bird in my collection, but have never been able to find a name for it. Though small in

size, and somewhat abnormal in coloration, it appears to agree in every essential particular of structure with the typical *Heteropelmata*; the outer toe being united to the middle toe up to the commencement of the third phalange, the scales of the tarsi being similar, and the bill of the same formation. In colour this species very nearly resembles the *Muscicapa aurifrons* of P. Max. (*M. luteocephala*, Lafr.)—a bird referred by Cabanis to *Elainea* and by Burmeister to *Euscarthmus*; but which, I think, from the structure of the feet ought rather to be placed near to, if not in the genus *Heteropelma*.

The species of *Heteropelma*, as far as I am acquainted with them, may be arranged as follows:—

a. *Heteropelma*, Bp. (ex MS. Schiff).

*Pedibus majoribus, fortioribus; rostro compresso, elongato, hujus apice uncinato.*

Sect. a. *Pileo unicolore.*

1. HETEROPELMA TURDINUM. — *Muscicapa turdina*, P. Max. Beitr. iii. p. 817.—*Ptilochloris rufo-olivaceus*, Lafr. Rev. Zool. 1838, p. 238, et 1847, p. 155. — *H. rufo-olivaceum*, Cab. et Hein. Mus. Hein. ii. p. 100, ex Brasil. Mer. Or.

2. HETEROPELMA VERÆ-PACIS, Scl. et Salv. P. Z. S. 1860, p. 300, ex Guatemala.

3. HETEROPELMA AMAZONUM, Scl., ex fl. Amazonum sup.

4. HETEROPELMA VIRESCENS (Lafr.).—*Musc. virescens*, P. Max. Beitr. iii. p. 802. — *Ptilochloris virescens*, Lafr. Rev. Zool. 1838, p. 238.—*H. unicolor*, Bp. Cab. et Hein. Mus. Hein. ii. p. 100.—*Pipra unicolor*, Langsd. MS. — *Pipra inornata*, Mus. Vindob., ex Brasil. Mer. Or.

Sect. b. *Pileo subcristato, aureo.*

5. HETEROPELMA FLAVICAPILLUM, Sclater, ex Brasil. Mer. Or.

β. *Neopelma*, nob.

*Pedibus debilibus, rostro brevior, latiore, apice non uncinato.*

6. HETEROPELMA AURIFRONS.—*Musc. aurifrons*, P. Max. Beitr. iii. p. 829.—*M. luteocephala*, Lafr. Mag. de Zool. 1833, pl. 13.—*Elainea aurifrons*, Cab. in Schomb. Reise, iii. p. 701.—*Euscarthmus aurifrons*, Burm. Thiere Bras. ii. p. 489, ex Brasil. et Guiana.



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