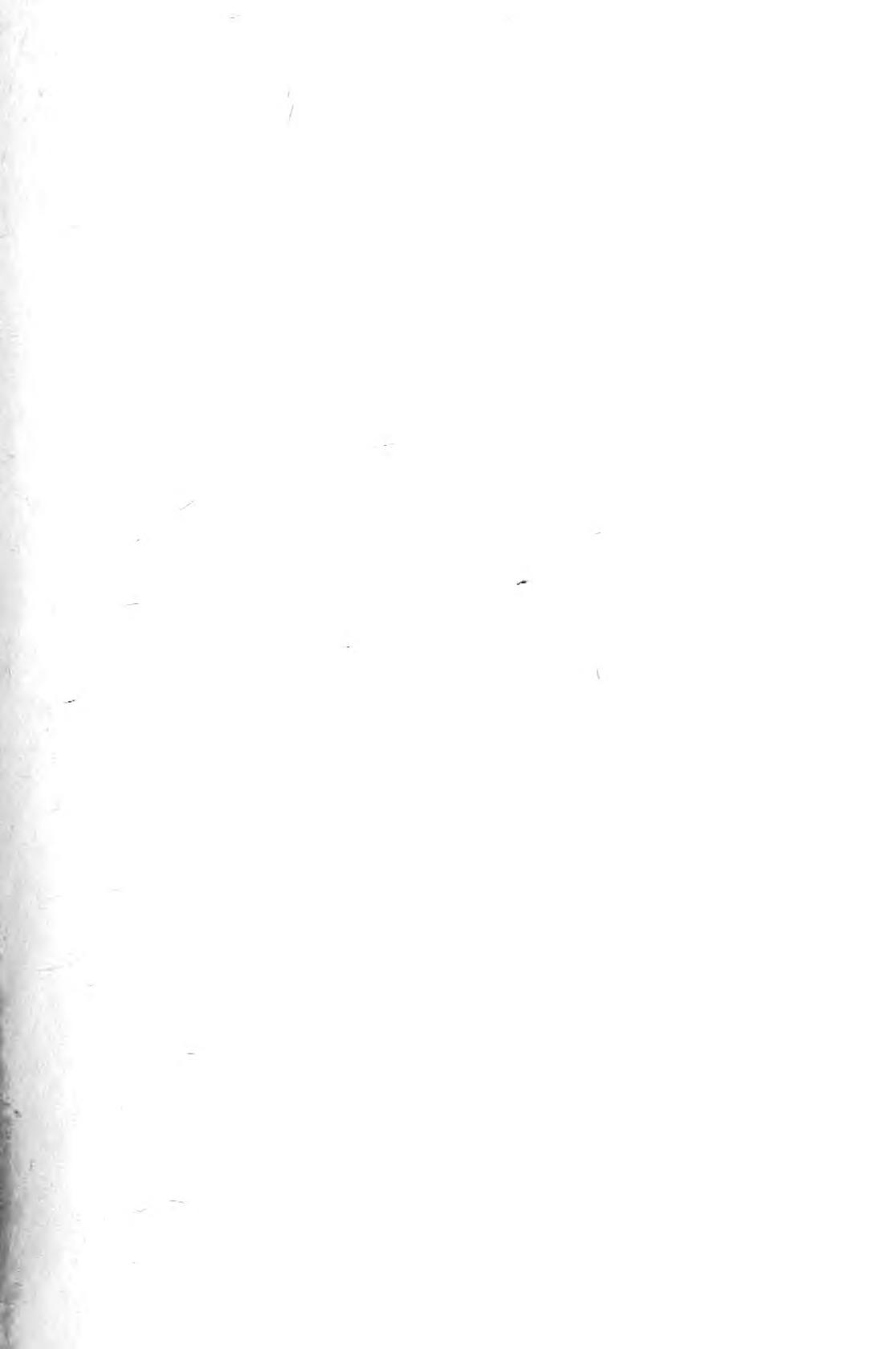




ZS 1A.

THIS BOOK MAY NOT BE PHOTOCOPIED







# PROCEEDINGS

OF THE

SCIENTIFIC MEETINGS

OF THE

# ZOOLOGICAL SOCIETY

## OF LONDON

FOR THE YEAR

# 1861.



PRINTED FOR THE SOCIETY,  
AND SOLD AT THEIR HOUSE IN HANOVER SQUARE.

LONDON :  
MESSRS. LONGMAN, GREEN, LONGMANS, AND ROBERTS,  
PATERNOSTER ROW.

PARIS :  
M. J. ROTHSCHILD,  
14, RUE DE BUCY.

LEIPZIG :  
M. J. ROTHSCHILD,  
2, QUERSTRASSE.

62.  
10-10.  
5.

LIST  
OF THE  
CONTRIBUTORS.

*With References to the several Articles contributed by each.*

---

	Page
<b>ADAMS, HENRY, F.L.S.</b>	
Descriptions of a New Genus and some New Species of Shells from the Collection of H. Cuming, Esq. ....	143
Description of a New Genus of Shells from the Collection of H. Cuming, Esq. ....	272
Descriptions of some New Genera and Species of Shells from the Collection of H. Cuming, Esq. ....	383
 <b>ANGAS, GEORGE FRENCH, Corr. Mem. Z.S.</b>	
Notes on the Broad-fronted Wombat of South Australia ( <i>Phascolomys latifrons</i> , Owen) .....	268
 <b>BAIRD, WILLIAM, M.D., F.L.S.</b>	
Note on the Occurrence of <i>Filaria sanguinea</i> in the body of the <i>Galaxias scriba</i> , a Freshwater Fish from Australia ..	207

	Page
Note on the <i>Lernæa cyclopterina</i> occurring in the Gills of the <i>Cyclopterinus spinosus</i> , a Fish from Greenland. . . . .	239
Notice of the Occurrence of <i>Sclerostoma equinum?</i> in the Testicle of the Horse. . . . .	271
 <b>BARTLETT, A. D.</b>	
Notice of the Occurrence of the Pink-footed Goose, <i>Anser phænicopus</i> . . . . .	18
Additional Note on the Black-footed Rabbit . . . . .	40
Exhibition of living examples of two singular hybrid Ducks from the Society's Menagerie . . . . .	44
On the Affinities of <i>Balæniceps</i> . . . . .	131
Remarks on the Breeding of the larger <i>Felidæ</i> in captivity	140
Remarks on the Japanese Masked Pig. . . . .	263
Notes on the Breeding and Rearing of the Chinese Crane ( <i>Grus montignesia</i> ) in the Society's Gardens . . . . .	369
Exhibition of specimens of young Polar Bears born in the Menagerie . . . . .	391
 <b>BENNETT, DR. GEORGE, F.Z.S.</b>	
Letter addressed to the Secretary respecting a singular Grallatorial Bird living in Sydney, lately described in France as <i>Rhinochetus jubatus</i> . . . . .	30
Note on the Egg of the Piping Crow or Magpie of New South Wales ( <i>Gymnorhina tibicen</i> ) . . . . .	183
Extract from his letter respecting the Semipalmated Goose	266
 <b>BLEEKER, DR. P. v., For. Memb. Z.S.</b>	
Conspectus generum Labroideorum analyticus. . . . .	408
 <b>BLYTH, EDWARD, Corr. Mem. Z.S.</b>	
Notes on some Birds collected by Dr. Jerdon in Sikkim. .	199
Extract from his letter respecting <i>Rhinoceros crossii</i> , Gray	306

## CRISP, EDWARDS, M.D., F.Z.S.

On some points relating to the Habits and Anatomy of the Oceanic and of the Freshwater Ducks, and also of the Hare (*Lepus timidus*) and of the Rabbit (*L. cuniculus*), in relation to the question of Hybridism . . . . . 82

Exhibition of drawings of two Fishes from a salt-water lagoon near Cape Coast Castle, West Africa. . . . . 87

## COBBOLD, T. SPENCER, M.D., F.L.S.

On Cystic Entozoa from the Wart-Hog and Red River-Hog 93

List of Entozoa, including Pentastomes, from Animals dying at the Society's Menagerie, between the years 1857-60 inclusive, with Descriptions of several New Species. . . . . 117

## DOHRN, Dr. H.

Descriptions of New Shells from the Collection of H. Cuming . . . . . 205

## DOW, Capt. JOHN M., Corr. Mem. Z.S.

Extract from his letter respecting *Anableps dowii* . . . . . 30

## DUNKER, Dr.

*Solenacea nova* Collectionis Cumingianæ . . . . . 418

## GOULD, JOHN, F.R.S., V.P.Z.S., &amp;c.

On a New Genus and Species of Parrakeet from Western Australia . . . . . 100

Remarks on a Species of Woodpecker from Siam. . . . . 182

Description of a New Species of the Family *Caprimulgidæ* 182

Descriptions of Two New Species of Humming-Birds belonging to the Genus *Hypuroptila* . . . . . 198

Observations on *Epthianura tricolor* . . . . . 209

	Page
<b>GRAY, GEORGE ROBERT, F.L.S., F.Z.S.</b>	
Note on the Genus <i>Basilornis</i> .....	183
List of Species composing the Family <i>Megapodiidae</i> , with Descriptions of New Species, and some account of the Habits of the Species.....	288
Remarks on and Descriptions of New Species of Birds lately sent by Mr. A. R. Wallace from Waigiou, Mysol, and Gagie Islands .....	427
 <b>GRAY, DR. JOHN EDWARD, F.R.S., V.P.Z.S., &amp;c.</b>	
Description of a Soft Tortoise from Camboja .....	41
Description of a New Squirrel in the British Museum, from New Granada .....	92
List of Mammalia, Tortoises, and Crocodiles collected by M. Mouhot in Camboja .....	135
On a New Species of Water Tortoise ( <i>Geoclemmys melanosterna</i> ) from Darien .....	204
On the Habits of the Gorilla and other Tailless Long-armed Apes .....	212
Observations on an Immature Specimen of a Species of <i>Calotragus</i> .....	235
Notice of a Stag from Northern China, sent by Mr. Swinhoe to the Zoological Society .....	236
On the Habits of the Pipe-Fish and other Fishes .....	238
Observations on Mr. Du Chaillu's papers on "The New Species of Mammals" discovered by him in Western Equatorial Africa .....	273
Notice of <i>Helogale</i> , a New Genus of <i>Viverridæ</i> .....	308
Notice of a New Species of Pilot Whale ( <i>Globiocephalus</i> ) from the Coast of Dorsetshire .....	309
On a Large Species of <i>Teredo</i> , supposed to be the Animal of the Genus <i>Furcella</i> , Lam. ....	313
Additional Observations on the Genus <i>Cuscus</i> .....	314

	Page
<b>GÜNTHER, DR. ALBERT, FOR. Memb. Z.S.</b>	
Account of the Reptiles sent by Dr. Wucherer from Bahia	12
On the Anatomy of <i>Regenia ocellata</i> .....	60
On the Anatomy of <i>Monitor niloticus</i> from Western Africa, and of <i>Regenia albogularis</i> .....	109
On a New Genus of Australian Fishes .....	116
On a New Species of the Family <i>Boidæ</i> .....	142
On a New Species of Fish of the Genus <i>Gerres</i> .....	143
Second List of Siamese Reptiles .....	187
List of the Cold-blooded Vertebrata collected by B. H. Hodgson, Esq., in Nepal .....	213
Exhibition of a singular Fish called <i>Saccolarynx flagellum</i> by Dr. Mitchell, and <i>Ophiognathus ampullaceus</i> by Dr. Har- wood .....	235
On a Collection of Fishes sent by Capt. Dow from the Pacific Coast of Central America .....	370
Exhibition of some Charrs from different localities in England, Wales, and Ireland .....	391
On a New Species of <i>Plectropoma</i> from Australia .....	391
 <b>HANLEY, SYLVANUS.</b>	
Description of a New <i>Leda</i> .....	242
Description of a New Species of <i>Pandora</i> .....	272
 <b>HEWITSON, W. C., F.Z.S.</b>	
Descriptions of some Butterflies from the Collection of Mr. Wallace .....	50
 <b>HOLDSWORTH, E. W. H., F.L.S., F.Z.S.</b>	
On an Undescribed Species of British <i>Zoanthus</i> .....	99

HUXLEY, THOMAS H., Prof. of Nat. Hist. in the Government School of Mines, F.R.S., V.P.Z.S.	
On the Brain of <i>Ateles paniscus</i> . . . . .	247
JOHNSON, JAMES YATE.	
Description of a New Species of <i>Cancer</i> obtained at Madeira	240
Description of a Second Species of <i>Acanthogorgia</i> (Gray)	296
Notes on the Sea-Anemones of Madeira, with Descriptions of New Species . . . . .	298
LEADBEATER, B., F.Z.S.	
Exhibition of fine examples of the Heads and Horns of <i>Ovis ammon</i> . . . . .	235
Exhibition of the Heads of three Stags shot by Col. Sarel at Pekin. . . . .	368
MÖRCH, OTTO A. L., of Copenhagen.	
Review of the <i>Vermetidæ</i> (Part I.) . . . . .	145
Review of the <i>Vermetidæ</i> (Part II.) . . . . .	326
NEALE, E. VANSITTART, F.Z.S.	
On Typical Selection, as a means of removing the difficul- ties attending the Doctrine of the Origin of Species by Natural Selection . . . . .	1
NEWTON, ALFRED, M.A., F.L.S., F.Z.S.	
Description of a New Species of Water-Hen ( <i>Gallinula</i> ) from the Island of Mauritius . . . . .	18
Remarks on Pallas's Sand-Grouse ( <i>Syrrhaptes paradoxus</i> )	203
On a Hybrid Duck . . . . .	392
On some New or Rare Birds' Eggs . . . . .	393

**PEASE, W. HARPER.**

- Description of a New Species of Mollusca from the Pacific Islands . . . . . 242

**PETERS, Dr. W., For. Mem. Z.S.**

- On the Asiatic Snake called *Taphrometopon lineolatum* by Prof. Brandt . . . . . 47

**PFEIFFER, Dr. L.**

- Descriptions of Forty-seven New Species of Land-shells from the Collection of H. Cuming, Esq. . . . . 20
- Descriptions of New Land-shells in the Collection of H. Cuming, Esq. . . . . 190
- Descriptions of Sixteen New Species of Land-shells from the Collection of H. Cuming, Esq. . . . . 386

**SALVIN, OSBERT, M.A., F.Z.S.**

- Descriptions of Three New Species of Birds from Guatemala . . . . . 202
- On a Collection of Reptiles from Guatemala . . . . . 227

**SCLATER, PHILIP LUTLEY, M.A., Ph.D., F.R.S., Secretary to the Society.**

- Announcement of the transfer by Her Majesty the Queen of a specimen of *Phacochærus æliani* to the care of the Society . . . . . 30
- Exhibition of a specimen of the American Meadow-Starling (*Sturnella ludoviciana*) . . . . . 30
- Exhibition of a specimen of a Caprimulgin Bird closely allied to *Cosmetornis vexillaria*, from the collection of E. Gabriel, Esq. . . . . 44
- Exhibition of the Hoof of a Bull (*Bos taurus*, var. *domesticus*) from the Falkland Islands, belonging to Capt. Abbott 44

	Page
Additions and Corrections to the List of Birds of the Falkland Islands .....	45
Additions to the Menagerie during the month of December 1860 .....	59
Exhibition of a living specimen of a Water-Tortoise ( <i>Chelodina longicollis</i> ) from South Australia .....	59
Note on the Reproduction of the Red River-hog ( <i>Potamochoerus penicillatus</i> ) in the Society's Menagerie .....	63
List of a Collection of Birds made by the late Mr. W. Osburn in Jamaica, with Notes.....	69
Exhibition of an example of <i>Pentacrinus caput-medusæ</i> ..	87
Additions to the Menagerie during the months of January and February.....	101
Characters of some New Species of American Passeres ..	127
On a New Species of the Genus <i>Copsychus</i> from Borneo..	185
On the addition to the Menagerie of some Three-toed Sand-grouse and some rare Australian Finches .....	196
List of Animals presented to the Society by H. E. Sir George Grey, K.C.B., F.Z.S. ....	208
On a New Species of Bird of the Genus <i>Lipaugus</i> of Boié	209
Additions to the Menagerie during the months of March and April 1861 .....	234
On the Island Hen of Tristan d'Acunha.....	260
Additions to the Menagerie during the month of May 1861 .....	264
Report on some specimens of Animals forwarded by Capt. Speke.....	268
Exhibition of a cast of the Skull of the Aye-Aye ( <i>Chiromys madagascariensis</i> ) .....	306
Report of the return of Mr. Benstead from the Cape with a second collection of Animals, presented to the Society by Sir George Grey .....	307
Additions to the Menagerie during June 1861.....	365

	Page
Additions to the Menagerie during July and August . . . .	366
Additions to the Menagerie during September. . . . .	367
Additions to the Menagerie during October. . . . .	368
Exhibition of original drawings by Mr. Vigne of <i>Ovis cycloceros</i> . . . . .	368
On a New Species of Finch, of the Genus <i>Sycalis</i> , from Mexico . . . . .	376
Descriptions of Twelve New Species of American Birds, of the Families <i>Dendrocolaptidæ</i> , <i>Formicariidæ</i> , and <i>Tyrannidæ</i>	377
Exhibition of the Skins of an Otter from Amoy, and of a Hare from the Island of Formosa, forwarded by Mr. Swinhoe	389
Report on a collection of Skins shipped by Mr. Swinhoe on board the 'Harkaway' . . . . .	390
Note on the Ocellated Turkey of Honduras. . . . .	402
Index generis <i>Elaineæ</i> ex familia Tyrannidarum, additis novarum specierum diagnosibus . . . . .	406
 <b>SHORTT, Dr., F.Z.S.</b>	
Letter respecting an Indian Snake . . . . .	265
 <b>SPEKE, Capt. J. H.</b>	
Letter relating to some specimens of animals from Zanzibar	267
 <b>STEVENS, SAMUEL.</b>	
Exhibition of Birds forwarded by Mr. Wallace from Mysol and Waigiou . . . . .	306
 <b>STEWART, JOHN A.</b>	
Description of <i>Asteronyx loveni</i> , Müll. et Trosch., a New British Starfish . . . . .	96

## STEWART, THOMAS HOWARD, M.R.C.S., F.Z.S.

Observations on the Anatomy of the Echinoderms . . . . . 53

## SWINHOE, ROBERT, Corr. Mem. Z.S.

Letter relating to specimens from Peking . . . . . 134

Extracts from his letter respecting the Formosan Deer .. 235

Extracts from his letter relating to specimens sent from  
China . . . . . 390

## TEGETMEIER, W. B.

Exhibition of some living specimens illustrating an unde-  
scribed abnormal variation of Plumage in the domestic Fowl. 102

## TOMES, ROBERT F., Corr. Mem. Z.S.

Additions to the Monograph of the Genus *Epomophorus* 11

Notes on a Collection of Bats made by Mr. Andersson in  
the Damara Country, South-western Africa, with Notices of  
some other African species . . . . . 31

Notes on a Collection of Mammals made by the late Mr.  
Osburn in Jamaica . . . . . 63

On the Genus *Monophyllus* of Leach . . . . . 87

Observations on the Genus *Vampyrus* and its Allies .... 102

Report of a Collection of Mammals made by Osbert Salvin,  
Esq., F.Z.S., at Dueñas, Guatemala, with Notes on some of  
the species by Mr. Fraser . . . . . 278

## TRISTRAM, Rev. H. B., Corr. Mem. Z.S.

Catalogue of a Collection of Terrestrial and Fluvial Mollusks  
made by O. Salvin, Esq., M.A., F.Z.S., in Guatemala 229

Exhibition of a Snake from Peking, and of a series of Pipits 391

Catalogue of a Collection of Mollusks from Bermuda . . . 403

WHITE, ADAM, Assistant Zool. Dept., British Museum.

Description of Two Species of Crustacea belonging to the  
Families *Callianassidæ* and *Squillidæ* ..... 42

WUCHERER, Dr. OTHO, Corr. Mem. Z.S.

On the Ophidians of the Province of Bahia, Brazil (Part I.) 113

On the Ophidians of the Province of Bahia, Brazil  
(Part II.) ..... 322

Description of a New Species of *Elapomorphus* from Brazil 325

## LIST OF PLATES.

Plate		Page
I.	Dentition of <i>Epomophorus</i> .....	11
II.	} New Species of Land Shells .....	20
III.		
IV.	<i>Lepus cuniculus</i> , var. ....	40
V.	<i>Trionyx ornatus</i> .....	41
VI.	<i>Callianassa turnerana</i> .....	} 42
VII.	<i>Gonodactylus guerinii</i> .....	
VIII.	<i>Diadema divona</i> , <i>D. diomea</i> , and <i>Drusilla domitilla</i> .	} 50
IX.	<i>Melanitis mimalon</i> and <i>M. leucocyma</i> .....	
X.	} Anatomy of the Echinoderms .....	53
X a.*		
XI.*		
XII.	<i>Potamochærus penicillatus</i> , fœm. et juv. ....	62
XIII.	<i>Chilonycteris osburni</i> .....	63
XIV.	<i>Vireo modestus</i> and <i>Lalates osburni</i> .....	69
XV.	<i>Monophyllus redmani</i> .....	87
XVI.	<i>Sciurus gerrardi</i> .....	92
XVII.	Entozoa from the Wart and Red River Hogs.....	93
XVIII.	<i>Vampyrus auritus</i> .....	102
XIX.	<i>Geophis guntheri</i> and <i>Nannoperca australis</i> .....	113
XX.	Entozoa .....	117
XXI.	<i>Hylobates pileatus</i> .....	135
XXII.	<i>Felis concolor</i> , juv.....	140
XXIII.	<i>Pelophilus fordii</i> .....	142
XXIV.	<i>Gerres longirostris</i> .....	142
XXV.	Structure of the <i>Vermetidæ</i> .....	145
XXVI.	Rev. H. B. Tristram's and Dr. Dohrn's Shells ..	205, 229
XXVII.	<i>Cervus pseudaxis</i> (?) .....	236

\* In some copies of the 'Proceedings,' Plate X a has been wrongly numbered XI., and *vice versâ*. The error will be readily detected on reference to the description of these two plates, p. 58.

Plate		Page
XXVIII.	<i>Cancer bellianus</i> .....	240
XXIX.	Brain of <i>Ateles paniscus</i> .....	247
XXX.	<i>Gallinula nesiotis</i> .....	260
XXXI.	<i>Myoxomys salvini</i> .....	278
XXXII.	<i>Megapodius quoyii</i> , juv.....	} 288
XXXIII.	— <i>reinwardtii</i> , juv. ....	
XXXIV.	— <i>tumulus</i> , juv. ....	
XXXV.	<i>Grus montignesia</i> .....	369
XXXVI.	<i>Phyllomyias semifusca</i> and <i>P. griseocapilla</i> .....	377
XXXVII.	Dr. Pfeiffer's new Land Shells .....	386
XXXVIII.	<i>Plectropoma richardsonii</i> .....	391
XXXIX.	New or rare Birds' Eggs .....	393
XL.	Head of <i>Meleagris ocellata</i> .....	402
XLI.	<i>Elainea pallatangæ</i> .....	406
XLII.	<i>Podargus superciliaris</i> .....	} 427
XLIII.	<i>Machærirhynchus albifrons</i> and <i>Todopsis wallacii</i> ..	
XLIV.	<i>Henicophaps albifrons</i> .....	



PROCEEDINGS  
OF THE  
SCIENTIFIC MEETINGS  
OF THE  
ZOOLOGICAL SOCIETY OF LONDON.

---

January 8th, 1861.

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

The following papers were read :—

1. ON TYPICAL SELECTION, AS A MEANS OF REMOVING THE DIFFICULTIES ATTENDING THE DOCTRINE OF THE ORIGIN OF SPECIES BY NATURAL SELECTION. BY E. VANSITTART NEALE, F.Z.S.

The great interest excited in the scientific world by the theory of the origin of species proposed by Mr. Darwin, and the obscurity necessarily attached to many of the data employed in the arguments adduced either in support of or in opposition to it, must be my apology for bringing before this Society the following considerations, resting upon admitted facts, but which appear to me both to elucidate the difficulties of that theory, and to suggest the means of overcoming them.

The strong points of Mr. Darwin's theory I apprehend to be, (1) the satisfactory explanation afforded by it of the analogies and differences observed in the various forms of living beings which have been, or actually are, the tenants of our globe ; (2) the fact, experimentally ascertainable, that the element of variation whence his explanations are derived exists in active operation at the present day. Mr. Darwin can say of the modifications of form manifested in living organisms,

PROC. ZOOLOG. SOC.—1861, No. I.

as Sir I. Newton said of the attractive force of the earth, "*hypotheses non fingo.*" I appeal to a power which can be shown to be at work in the present world; I ask only, is it capable of explaining the phenomena observable now, or ascertained by probable induction to have occurred formerly upon it?

These are great merits. But if these strong points of the theory are connected with the principle of diversity, whence the animal and vegetable creation derives the charm of its endless variety, it has, as I conceive, also its weak points connected with the opposite principle of *unity*: whence it attributes too large a share to death, and too small a share to life, in the formation of species.

In nature we find *two* powers at work, a principle of *change* producing varieties, and a principle of *permanence* producing species. Man is able, by making use of the principle of change, "adding up," as Mr. Darwin happily says, the successive minute differences of different generations in different directions, to bring about wonderful transformations in the original form whence he started,—from the Rock Pigeon, for example, educating Carriers, Tumblers, Runts, Fantails, &c., forms differing from each other more than do many undoubted natural species—more, for instance, than Fieldfares differ from Thrushes, or Wood Wrens from Willow Wrens. But, although man can do wonders through this principle of *change*, the principle of *permanence* slips through his fingers. He can preserve his varieties in their distinctness, only so long as he intervenes to prevent their interbreeding. Leave Carriers and Tumblers, Fantails and Runts together, without pairing them, and a race will soon arise neither Carrier, nor Tumbler, nor Fantail, nor Runt, but apparently in the process of reverting towards the Rock Pigeon. But Fieldfares and Thrushes, Wood Wrens and Willow Wrens live on for generation after generation, side by side, and remain Fieldfares and Thrushes, Wood Wrens and Willow Wrens still.

That this is the case, is unquestionable. It is equally clear why it is the case. Each distinct species in nature interbreeds by preference with those of its own kind; and if accidental unions do take place between nearly allied species, the offspring are either sterile or, at all events, much less fruitful than their parents. Here is the principle of *permanence* in nature, preventing the principle of *change* from producing *confusion*, as, again, the principle of *change* prevents the principle of *permanence* from producing *monotony*. Whence comes this principle of permanence? I look to Mr. Darwin for an answer, in vain. All that he says on this point amounts only to the position that the progeny of nearly allied species are not always sterile. That the preservatory tendency does not necessarily accompany a given amount of external difference is clear; for man can produce in living organisms external differences greater than those associated in nature with this principle of permanence, without calling that principle into action. To attribute it to the greater length of time occupied in the formation of natural species than in that of a variety, is to make an assumption wholly destitute of proof, and indeed inconsistent with a very beautiful and essential part of Mr. Darwin's hypothesis, namely, the doc-

trine that the living principle never loses its energy, and that the power of life now at work on our globe has been transmitted, unchanged in its essence, though infinitely richer in its manifestations, from the first inhabitants of the earth to the generations inhabiting it at the present day.

If then, Mr. Darwin may appeal to the principle of *change* disclosed in living organisms, as a "true cause," capable of accounting for the mutual affinities of species by the supposition of descent from a common origin, those who are opposed to his views are no less entitled to appeal to the principle of *permanence*, disclosed in these organisms, as a real force, not to be explained away, but requiring to be reconciled with the principle of change in any theory which shall satisfactorily account for the origin of species.

It appears to me that this reconciliation may be effected through the intervention of a conception proposed by one of whose labours and reputation we are justly proud, as an explanation of the "homologies" of structure, which he has profoundly illustrated. I mean the conception of the typical character pervading all organic life. But to make this apparent, I must premise some remarks on the characteristics of natural types. The types of nature must be carefully distinguished from the types of art. The types of art are forms realized in their perfection in some particular individual. A Phidias may produce a Jupiter, a Minerva, or a Venus, as the perfect outward embodiment of the ideal of Majesty, or Wisdom, or Grace. A Danecker may toil for years, in labour with his conception of the head of Christ. But in each case, the type, when realized, is a fixed, individualized object, expressing some one predominant characteristic, to which all others, though not necessarily lost, are subordinate. The types of nature are, as I conceive, ideals not of external form, but of internal relations, each realized in countless modifications of forms differing from one another in infinitely varied particulars, but balanced around central points common to them all. But the preservation of this balance depends upon the aptness of each variety of the type for interbreeding with all the rest, and thus perpetually recombining its own peculiarities with theirs. If any of the varieties by the action and reaction of which a type is preserved become locally distinct from the others, subtypes will arise; as we find to be the case in mankind. The original type becomes the centre of a circle including many lesser circles, where we find the same tendency repeated. Now this character of natural types offers a mode of passage from one type to another. Assume a subtypical variety to acquire a special aptness for interbreeding with itself, to the exclusion of other varieties, and it would become an independent type. But how is this special aptness to be acquired? That it does not accompany the formation of subtypes we see in numerous instances; and it would clearly be inconsistent with the idea of a natural type that it should do so, if, as has been suggested, it is the characteristic of such a type to preserve itself by the mutual actions of its varieties. That it should belong to some one variety and not to others, in virtue of the general principle of variation, is a supposition inconsistent with

itself: a general principle must apply to every individual case. There remains only the hypothesis of a special selection, by which particular varieties are internally modified, so as to acquire this special aptitude. Now such a special selection appears to me to involve the transition, which must take place at some point in all physical research, from conditioned, to self-conditioning power, from will working by upholding laws, to will working by constituting the laws to be upheld; in other words, we must resort to the hypothesis of an intelligent action as the only intelligible one. Accordingly it is to an intelligent choice, exercised upon the infinity of possible variations capable of arising in different organisms, through the laws belonging to their natures, that I would attribute the formation of species by what I venture to call Typical selection.

When that Power, of whose ordering will I conceive nature to be the expression, purposes to produce a new race, I suppose It to select from some existing race those individuals which show a disposition to vary in the desired direction, so modifying their constitutions as to render their unions with each other more prolific than their unions with other individuals differently formed, and if they are conscious agents, so modifying their instincts as to give them a preference for each other. How this internal modification is produced, I no more attempt to explain than Mr. Darwin attempts to explain how life was originally produced and is continued. The one act is not more difficult to conceive than the other. But there is no necessity for supposing the modification to be considerable in any one case. Divine providence need not be in a hurry. The amount of change at any step of the process of forming a new species, may be very small, and the completion of that process may require many generations.

The modification of the sexual instinct and fertility of sexual unions may be gradually introduced, and at first be scarcely perceptible. But if the alteration be brought about by an internal action tending always in the same direction, each generation will approximate more closely to the character of a new type; and by the time that the external change has become considerable, a corresponding amount of internal change will have been produced. A new phase of the principle of permanence will have taken its place in creation, amongst the many phases of the principle of change; the variety will be transformed into a species.

By this conception of the origin of species, we escape from another serious difficulty, which appears to me to lie in the way of the conception of their formation by such a process of external selection as Mr. Darwin assumes. When we are asked to suppose that differences so considerable as we observe between different organisms, past or present, have been brought about by a process precisely analogous to that by which man can change the shape of a sheep or a pigeon, we naturally ask whether there are no limits to the amount of change producible by man? Could he, by any degree of watchfulness however long continued, expand a race of sparrows to the size of condors, or condense a race of turkeys to the size of humming-birds, or

lengthen out a pig's snout, and thicken his legs and body into a trunk and frame similar in size to the elephant? Mr. Darwin must contend that this would be possible, if man continued to act uninterrupted, for a sufficient length of time in the same direction. Perhaps future experiments may enable us to speak with certainty upon this point. At present I conceive the general feeling of the most experienced breeders would be against him. It may be true that they "habitually speak of an animal's organization as something quite plastic, which they can mould almost as they please" by the principle of selection (Darwin, p. 31). Yet Mr. Darwin also tells us that "all the breeders of the various domestic animals, and cultivators of plants, with whom he has ever conversed, or whose treatises he has read, are firmly convinced that the several breeds to which they have attended are descended from so many aboriginally distinct species" (*id.* p. 28). Now they are no doubt mistaken in this notion; and it is easy to see whence the mistake has arisen,—namely, from each one having attended only to one out of many possible kinds of variation, producible in the particular animal or plant forming the object of his care. But it is difficult to conceive whence the general notion could be derived, if each breeder found no limit, no stop, to the amount of variation which he can produce in the particular direction selected by him for experiment.

But this difficulty disappears, like that first stated, if the process of selection be transferred from the external action of circumstance, to the internal action of the living Power gradually modifying the constitution of the individual. It is a supposition agreeable to common experience, that to each particular constitution, certain limits of change are assigned, within which the possible varieties of the creature possessing it fluctuate. But if the constitution changes, these limits must be presumed to change also. Each fresh species, then, may be regarded as a resting-place in the advance of life,—the development of the possible varieties inherent in it being left to the external action of circumstances; while among these the Power manifested in life selects the forms most suitable to be converted into other species, and thus carries on the differentiation of living beings a step further in its proposed course.

Other grave difficulties disappear if we accept the idea of "typical," in place of "natural" selection. One very serious one, in my judgment, is the difficulty of seeing how natural varieties could perpetuate themselves at all, if they retained that mutual prolificness characteristic of all the varieties upon which we can experimentalize.

Able and ingenious as is Mr. Darwin's argument to show that selection, by the "struggle for existence" is possible, he seems to me, throughout the whole of it, to confuse two distinct conceptions, namely, the *effect* of peculiarities of structure in giving one plant or animal an advantage over another, and the *preservation* of those peculiarities. His reasoning would be conclusive if applied to a state of things where each different variety was distinguished by an exclusive disposition to produce its own kind, as we actually find to be the case with species; but he applies it to a state of things

where, by his own hypothesis, he has swept away the ground of his argument. If one variety of wading birds possessed longer bills than another, this "advantage" might lead to the ultimate annihilation of the short-bills, through the more rapid multiplication of the long, if a long-billed parent always produced a long-billed offspring. But if the long-bills and the short live side by side, as they must do if they are to struggle for existence, and possess that aptness and disposition for interbreeding which all known varieties are experimentally found to possess, and the laws of interbreeding be supposed to be what they now are, long-bills and short would soon merge into one race of medium-billed birds, between whom the struggle for existence would be reduced to one of individual strength. In connexion with this topic, the fact insisted upon by Mr. Darwin must be borne in mind, that intercrossing between varieties is conducive to fertility, as on the other hand breeding in and in is well known to cause unhealthiness, if not sterility. On the whole, then, I conclude that the permanent distinction of type which Mr. Darwin assumes to result as a *consequence* from the struggle for existence, is really a necessary *condition*, in order that this struggle may assume the form of a contest of races.

Illustrations of this position might be endlessly multiplied. I will adduce one only, drawn from the instance of the humble bee and the honey bee, the origin of whose architectural powers is the subject of a most interesting and ingenious discussion in Mr. Darwin's work. He adduces, as the "advantage" of the honey bee, and therefore the constitutive principle of its peculiarities, the economy of wax in the construction of its cells when compared with the round imperfectly connected cells of the humble bee; for thus, in seasons when honey was scarce a saving in food might result. But the humble bee still raises her lowly dwellings along side of the palatial store-houses of her insect neighbour. Whatever the vicissitudes of the seasons may have been, since she first appeared on the earth, Death has not swept her away; she survives now. What probable ground, then, is there for assuming that she was not present when Mr. Darwin's incipient honey bee began its work, to destroy by intercrosses the peculiarities of her rival, and bring down its "advantages" to the common level?

It is unnecessary to dwell upon the complete removal of this difficulty, by the supposition of "typical selection." But more notice is requisite of the bearing of this supposition upon another subject, whereon Mr. Darwin's hypothesis of selection by means of the struggle for existence has produced much controversy, namely, the evidence of the "stone-book." That, if a new species can be formed at all by "natural selection," it can be only as the ultimate result of a long balancing of rival tendencies, ending in the preponderance of one side, Mr. Darwin admits. It follows, as he also admits, that each new species, if thus formed, must have left behind it a long trail of intermediate forms between itself and the species whence it arises. Now, we do not find this "trail;" the links are wanting in many cases; and Mr. Darwin's explanation of their failure is, that they once

existed, but that the evidence of their existence has either not yet turned up, or has been altogether swept away.

Other eminent geologists have questioned the probability, if not the possibility of this total sweeping away of the links wanted to bind together, upon Mr. Darwin's supposition, the forms known to have existed. I do not propose to enter into this controversy, but only to remark that, whatever difficulty may arise from the absence of intermediate forms in tracing connected lines of descent of the different forms whose existence has been ascertained, it is most materially diminished on the hypothesis of typical selection,—(1) because the advance in each case will be always in the same direction, and therefore the interval between one marked form and another will be indicated by much fewer steps than are required on Mr. Darwin's supposition, even if each step be very gradual; (2) because it is consistent with our present experience, that a very considerable amount of change may take place in animal or vegetable organisms at once. I will refer only to General Tom Thumb, and the Giant whose skeleton is preserved in the College of Surgeons, in proof of the important departures from the ordinary human scale of proportion which may be produced at one birth, under the ascertained laws of life. Now, suppose individuals, male and female, characterized by the possession of forms thus departing from the general human standard, to be selected to constitute a new human species, forming the centre of variations extending on all sides of the type thus manifested, and the process to be repeated three or four times, by transitions of equal magnitude on each occasion, in both directions; we should arrive at forms almost as distinct from each other as Swift's men of Lilliput and Brobdingnag. And yet the intermediate variations might succeed each other at short intervals, and leave but scanty traces of their existence in any geological record. The Lilliputian and Brobdingnagian students of geology might thus find it as difficult to connect their own history with that of the present race of mankind, by geological evidence, as we find it to trace the descent of Teleostean fishes, or Saurian amphibians, by the same records.

The conception of "typical selection" seems also to elucidate another subject, not altogether unencumbered with difficulty on Mr. Darwin's hypothesis, namely, the disappearance of types. If one species is educed out of another by a modification of the sexual character of some particular variety of the first, whence it acquires a peculiar aptness and disposition for interbreeding, this variety would be withdrawn from the circle of varieties by whose mutual action the original type was preserved. Consequently the type would itself have a tendency to alter; and if several varieties were thus withdrawn from any type, it would seem that this type must change into some modification of itself, and take its place amid the circle of variously related types evolved out of its original unity. The process would be analogous to what appears to have happened in some cases, where, through local circumstances or human interference, many distinct varieties of the same plant or animal have been formed, as in the case of wheat, of horses, of dogs, and of man himself; and the result

seems to accord with many ascertained facts in the relations of plants and animals, living and extinct.

If in the course of these observations I have been occupied in criticising rather than in defending Mr. Darwin's views, the object of this criticism has been to separate what I regard as a most valuable scientific conception, from association with a theory which, though highly ingenious, is entirely hypothetical, and, in my judgment untenable.

That there is a principle of variation at work around us in the living world, animal and vegetable, is certain. That by adding up successive changes effected by this principle, we can bring about a large sum of total change, is ascertained. The idea that the variety of living beings to be observed on the earth has arisen from the long-continued operation of this ascertained principle of variation during the countless ages when, as we learn from geology, a vast succession of creatures gradually tending to similarity with those existing now, have followed each other as its occupants—creation, to use the forcible language of Professor Owen, ever compensating for extinction—is an idea full of the promise of scientific results, because it seeks to explain the unknown by the known or knowable, and to substitute thought interpreting experiment, in place of thought dealing only with itself. This true scientific character forms the distinction between Mr. Darwin's fundamental hypothesis and the theories of those who like Lamarck, or the author of the 'Vestiges of Creation,' have previously attempted to embrace under one comprehensive thought the riches of the organic world. They presented only conjectures incapable of being tested; he has offered a conception respecting the past, which may be tested by the study of the present.

But this observation applies only to the conception that specific differences arise from selection. In referring the method of selection to the "struggle for existence," Mr. Darwin leaves the solid ground of experiment for the airy regions of ingenious hypothesis. The "struggle for existence" is perpetually going on around us; yet Mr. Darwin has not adduced a single case of even an approach to the formation of a new species as its ascertained result. All his instances of the effects produced by the addition of minute changes, in animal or vegetable organisms, are instances where the principle of variety is modified in its operation by the principle of intelligent choice. That the last principle has been concerned in producing the changes observed in nature, we cannot, indeed, show directly; but when we learn experimentally that, by this means, something very like natural species can be produced, surely it is more accordant with the sobriety of science to assume that by this means also natural species have been produced, than to refer their production to another principle, which cannot be shown to be in operation at all, and of which, if it is in operation, we cannot show how it could bring about the effects attributed to it.

I have said "something very like natural species;" for, as has been observed above, man cannot confer upon his varieties the self-preserving power characteristic of true species. But this is only accordant

with the universal analogy of the distinction between man's work and the works of what we call Nature. Man always works from without, Nature from within. But otherwise their works are subject to similar conditions. The crystalline lens of the eye is formed of elementary particles, held together by molecular or chemical attraction, as is the lens of the eyeglass. The formation of the optical image, the prevention of diffraction, is brought about in each case by an observance of the same principles of construction. But the eyeglass is shaped and put together by a power operating from without, upon masses of elementary particles, already drawn to each other by their natural attractions. The lens of the eye is formed by a power working from within, which draws these elementary particles together, by secret processes, into positions where their natural attractions keep them in the required arrangement.

So is it, as I conceive, in the formation of species. Man and Nature both bring about changes of form in organized beings, by the same process, namely, by directing into particular channels the tendency to vary inherent in all organisms, "adding up" in different directions the sum total of many changes, tending the same way. Both effect this addition by the same instrumentality, namely, by favouring sexual intercourse in the organisms which show a tendency to vary in the required direction, and impeding it in those which do not. But man, working in this case as in every other from *without*, can effect his "additions" only by bringing the suitable organisms together for the purpose of that intercourse, and keeping the unsuitable apart. Nature, working, in this case as in every other, from *within*, effects her additions by so modifying the wish for this intercourse, that the animals whom she desires to bring together shall prefer each other's society, and so modifying its consequences, that accidental unions of organisms, whether animal or vegetable, with other than the organisms suitable for her purposes, shall be incapable of seriously disturbing them. To seek an explanation of the natural process in an external action, seems me as contrary to the whole analogy of our knowledge, as it would be to seek an explanation of the human process in an internal action.

And yet there is an external action in nature, bearing upon the constitution of species—an action admirably described by Mr. Darwin under the name of the struggle for existence, and having, as I apprehend, an effect analogous to that of external action on living organisms considered individually. The struggle with circumstances destroys the dead, but it develops and exercises the living individual; and so the struggle for existence develops the capacities of variation of each typical form, while it prevents those variations from injuring the type. For the order of the living creation depends upon the more or less perfect transmission of the distinctive peculiarities of each living being to its descendants; and since these peculiarities are subject to constant variation, there would be a tendency to a perpetual degradation of each natural type, but for some counteracting influence. For the characters of a living being cannot be balanced like

ciphers in arithmetic—so many good on the *plus* side, so many bad on the *minus*: they involve a mutual harmony, which cannot be departed from far in any direction, without fatal injury to the whole: one vice spoils many virtues; and the union of great perfections with great defects can, at the best, be only grotesque.

Now the risk of degradation consequent on these circumstances appears to be prevented principally by two causes: first, that, in the general course of nature, more than one individual must concur in every act of generation; for since these individuals commonly differ in their accidental peculiarities, these peculiarities tend to efface each other, and thus to preserve in their offspring the typical character: secondly, that Death is, so to speak, ever on the watch to keep the individual up to the mark, sternly sweeping away the varieties afflicted with any serious imperfection, while he leaves the more perfect specimens to transmit their endowments to their posterity,—an operation probably aided by what Mr. Darwin has called “sexual selection.”

In this conservative action, not in the creative operations ascribed to Death by Mr. Darwin, his true function appears to me to consist. Death throws away the worst of each *kind* to preserve the best; but he must have the *kind* given him to operate upon. So he sweeps away those types which change of circumstances have made unsuitable to the surrounding creation, to make room for others; but these are educed from the former, not by the unconscious action of death, but through an “ordained becoming,” realized by the wise foresight of the ever-acting Power whose works we generalize into Nature.

Our greatest living poet has poured forth the dirge of existence:—

“Are God and Nature, then, at strife,  
That Nature lends such fearful dreams?  
So careful of the type she seems,  
So careless of the single life.  
So careful of the type! but no,  
From scarped cliff, and quarried stone,  
She cries, “A thousand types are gone,  
I care for nothing—all shall go.”

But the history of organized being, considered as a succession of typical forms, assumes a more cheerful character; life appears everywhere triumphant over death. As, in the order of nature the individual transmits to its successors its own peculiarities, modified, indeed, but not lost in the great stream of being, so each type, if it passes away when it has done its work, is yet not lost, but transmits to succeeding types the undying fire, tinted with its own characteristic hue. And this succession of typical forms, like the perpetuation of each particular type, is brought about by the action of the individual, following the laws and impulses of its own nature, and unwittingly contributing, by the performance of its own little part, to the gradual unfolding of the majestic drama of creation. But the arrangement of the scenes is due to foresight, not to chance, to the constructive power of thought adapting organization to circumstance, not to any





Fig 1.



Fig 2



Fig 1a



Fig 2a



Fig 2b



A B C D E  
Fig 5



A B C D E  
Fig 6



B C D  
Fig 7

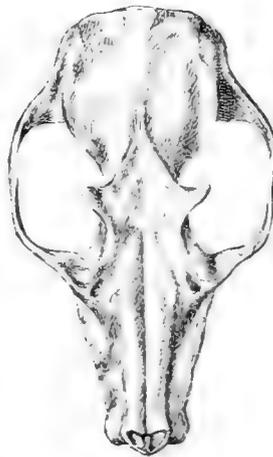


Fig 3a

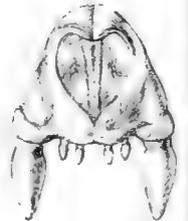


Fig 3b.



Fig 4a



Fig 4



Fig 3

power in circumstance to create by destroying. In the words of the same great master whose language I have already quoted—

Nature also, cold and warm,  
And moist and dry, *devising* long,  
Through many agents, making strong,  
Matures the individual form.

## 2. ADDITIONS TO THE MONOGRAPH OF THE GENUS EPOMOPHORUS. BY ROBERT F. TOMES, CORR. MEMB. Z.S.

(Plate I.)

### 1. EPOMOPHORUS LABIATUS, Temm., sp.

Since the publication of my monograph of the genus *Epomophorus* in the 'Proceedings' of the Society, the kindness of Prof. Schlegel has enabled me to examine the type specimens of the *Pachysoma labiatum* of M. Temminck in the Leyden Museum; and I find that the male, as I had supposed, is quite distinct from *E. macrocephalus*, although not differing from it so greatly as I formerly believed. It resembles the latter species in its general proportions and appearance, especially in the length of the head and face; but it has longer fur on all parts of the body, and that of the back is somewhat redder in colour. On the abdomen is an oval whitish patch rather more distinct than in *E. macrocephalus*, but less so than in *E. franqueti*. The specimen is nearly, if not quite adult, and has the following dimensions:—

	in.	lin.
Length of the head and body .....	4	9
——— of the head .....	1	10
——— of the ears .....	0	7
——— of the fore-arm .....	2	6
——— of the longest finger .....	4	6
——— of the fourth finger .....	3	6
——— of the thumb .....	1	1
——— of the tibia .....	1	1
——— of the foot and claws .....	0	9
——— from the nose to the ear .....	1	5
——— from the nose to the eye .....	0	9
Expanse of wings, about .....	17	0

The so-called female of *Pachysoma labiatum* contained in the same collection is quite a young example of some larger species with a less elongated muzzle, probably of *E. gambianus*.

### 2. E. CRYPTURUS, Peters.

In my account of *E. gambianus* I included the *E. crypturus* of Dr. Peters as a synonym; but the assertion of the identity of the two species had scarcely appeared before I saw in the Leyden Museum, a specimen which differed from *E. gambianus* in several respects. Shortly afterwards a specimen of an *Epomophorus* from Natal came into my hands, which I had no difficulty in recognizing

as identical with the species in the Leyden Museum; and a more careful examination and comparison of this species with the type specimen of *E. gambianus*, and with the admirable figures and detailed description of *E. crypturus* given by Dr. Peters, induced me to refer it to the latter species, which I now regard as distinct. It will be unnecessary to enter into a detailed description of the species, because that has been so well done by the original describer; but it may not be out of place to state the chief points of difference between it and *E. gambianus*, which I have before described.

The *E. crypturus* is altogether rather smaller than *E. gambianus*, and has the fur on all parts much longer, and extending much more on to the membranes, especially along the fore-arm, above and below, on the legs and feet, and on the membrane of the coccyx. The ears are broader, but not longer; and the interfemoral membrane is of greater breadth, especially near the calcaneum. The supra orbital processes of the cranium are also longer than in *E. gambianus*; but it is necessary to state that these parts in the figure of the skull of the latter species, which accompanies this communication (figs. 2 and 2 a), are represented as a little too short, their points having been broken off before passing into the hands of Mr. Ford.

#### EXPLANATION OF PLATE I.

The accompanying plate is given to illustrate the peculiarly formed crania of some of the species of *Epomophorus*, and to show, comparatively with that of the allied genera *Pteropus* and *Pachysoma*, the singular dentition of this genus.

Figs. 1 and 1 a. *Epomophorus macrocephalus*, from the type specimen.

Figs. 2, 2 a, and 2 b. *E. gambianus*, from types.

*Note.*—The supra-orbital process in these figures is represented as rather too short.

Figs. 3, 3 a, and 3 b. *E. franqueti*, from type specimens.

Figs. 4 and 4 a. *E. schoensis*, from a specimen from Gaboon.

Fig. 5. *Pteropus edulis*.

A. First or rudimentary premolar, often absent.

B. Second premolar, corresponding with the *carnassier* of the *Carnivora*.

C, D, E. True molars, the hinder one of rudimentary size and shape, and showing the first indication of that decrease in their development which attains its full extent in *Epomophorus*.

Fig. 6. *Pachysoma stramineum*.

The letters A, B, C, D, E indicate the same teeth as in fig. 5; those marked C, D, E are more rudimentary than in *Pteropus*, C, D, E of fig. 5.

Fig. 7. *Epomophorus macrocephalus*.

The first premolar and last true molar are absent, and the second molar (D of figs. 5 and 6) is here much reduced in size, and corresponds in its degree of development with E of figs. 5 and 6.

### 3. ACCOUNT OF THE REPTILES SENT BY DR. WUCHERER FROM BAHIA. BY DR. A. GÜNTHER.

Of the living specimens of Reptiles sent by Dr. Otto Wucherer from Bahia, only a few have survived the transport. Most of them perished during the voyage; and several arrived in so exhausted a

condition that they died very shortly afterwards. It became evident, from the emaciated state of the latter, that those animals had been killed, not by the change of the temperature, but by want of food and water. Those tropical animals naturally require a greater supply of the latter than our European species do; and perhaps it would be better to place them during the transport in a cool place on board the steamer, in order to subdue the natural functions and to lessen the desire for food. Once every week, on a bright day, they ought to be brought on deck and exposed to the sun; then some water might be poured into the cage or box in which they are kept. I have no doubt that the failures hitherto experienced in bringing over the beautiful *Hylæ* of the Tropics, and other reptiles living in damp places, might be avoided by the adoption of the measures recommended.

As it is, however, only three of Dr. Wucherer's specimens survive—a beautiful specimen of the South American Rat-Snake, *Spilotes variabilis*, about 6 feet long, one *Polychrus marmoratus*, and one *Philodryas viridissimus*. The two former are exhibited for the first time, and apparently are doing very well. The Rat-Snake feeds regularly on birds and small mammals; Dr. Wucherer has observed that this species has the power of setting its tail in a trembling motion, like the Rattle-Snake, if made angry. I have once seen the same in the specimen living in the Gardens, and several times in the North American *Coluber quadrivittatus*, whenever it was attacked by a dog: in the latter case, it was not fear which produced the trembling motion of the tail; for it was immediately followed by the snake striking at the dog\*.

The specimens of *Polychrus marmoratus* show the remarkable peculiarity, that their femoral pores are not visible; this has been observed also by Bibron, who says that they are often very indistinct in this species. It changes its colours, like the Chamæleon, the name of which has been conferred on it by the inhabitants of Bahia. Its ground-colour is brown when it is cold or asleep, bright green when it feels comfortable, and yellowish-green when exposed to great heat. Also the great capacity of the lungs and the lively motion of the eyes (which, however, act in concert with each other) remind one of its representative of the Old World. Since it has been removed to a warmer place than the cages in the Reptile-house are, it has recovered its full strength, feeds regularly on meal-worms, and is very fond of milk. Being a Tree-Lizard, its favourite place is on the branches of a large geranium, near the fire-place; but even that place is sometimes too cold for it; and then it will approach nearer to the fire than it is possible to keep the hand for any length of time. Nevertheless it lies there basking for hours, extending the neck towards the fire, and stretching the hind limbs in a line with the tail. These animals will drink much; and the quantity of water swallowed on a single day by this specimen, the body of which does not exceed the length of 5 inches, cannot be less than half an ounce.

\* The young of *Cenchrus piscivorus*, born alive in the Gardens about the middle of February, show this peculiar motion more frequently than any other of the species mentioned.—March 5.

The researches of Dr. Wucherer, continued for a considerable space of time and confined chiefly to Snakes, prove that the environs of Bahia are by no means so poor in species of this tribe as has been represented by Castelnau. On the contrary, the following list, containing chiefly the species common in the immediate vicinity of Bahia, will be considerably increased, if Dr. Wucherer carries out his intention of extending his researches beyond those limits; and it is to be hoped that, with the assistance of this gentleman and of his friends\*, we shall produce one of those local faunas which are so valuable as contributing to our knowledge of geographical distribution, and to the distinction of the local variation of species.

The following list of Snakes has been made up from the notes of Dr. Wucherer, and from actual specimens sent in spirits to the British Museum:—

1. *Geophis*, n. sp.† From Canavieras, a small town south of Bahia.
2. *Elapomorphus wuchereri*, Gthr. From Ilhéos.
3. *Liophis cobella*, L.
4. — *merremii*, Wied. Very frequent.
5. — *reginæ*, L. Very frequent.
6. — *conirostris*, Gthr.
7. *Xenodon severus*, L.
8. — *rhabdocephalus*, Wied. Very frequent.
9. — *colubrinus*, Gthr. The validity of this species has been fully acknowledged by Dr. Wucherer. He has sent two specimens in spirits, one of which measures 3 feet 8 inches in length; another, sent off alive, perished on the voyage. Dr. Wucherer has observed that the scales of all the species of *Xenodon* have a small colourless spot near the tip; it is especially distinct in *X. colubrinus*. The West Indian species of *Dromicus* have this spot yet more distinct. All the species of this genus are very savage and apt to bite; they frequent dry places; their food, however, consists in frogs.
10. *Spilotes corais*, Cuv. Frequent; called *Pupapinta*. Scales in fifteen or seventeen series.
11. *Spilotes variabilis*, Wied. Frequent; called *Cainana*. Dr. Wucherer found the loreal always absent in old specimens.
12. *Spilotes pæcilostoma*, Wied.
13. *Coryphodon pantherinus*, Merr. The form of the head and the colours of this species vary much according to age.
14. *Herpetodryas fuscus*, L. Frequent.
15. — *carinatus*, L. Less frequent.
16. *Philodryas viridissimus*, L. Very frequent.
17. ? — *serra*, Schleg. A single specimen from Ilhéos.
18. *Dryiophis acuminata*, Wied. Very frequent; called *Cipó*.
19. — *argentea*, Daud. Less frequent.
20. *Thamnodynastes nattereri*, Mikan. Frequent.

\* Dr. Wucherer has been assisted in collecting by Consul C. A. Gültzow, Dr. Heller, Dr. Tölsner, Herr v. Steiger, H. Föppel, and other gentlemen. Mr. Bennett has kindly taken charge of the reptiles during the transport.

† Dr. Wucherer has reserved for himself the description of this species.

21. *Thamnodynastes punctatissimus*, Wagl. One specimen from Canavieras.

22. *Leptodeira annulata*, L. Very frequent.

23. *Eudipsas leucocephalus*, Mikan. Frequent.

24. *Leptognathus catesbyi*, Weig. Two specimens from Canavieras.

25. *Scytale coronatum*, Schneid.

26. *Oxyrhopus clælia*, Daud.

27. — *petolarius*, L.

28. — *trigeminus*, D. & B. Frequent.

29. *Uranops angulatus*, L. Frequent near rivers.

30. *Elaps lemniscatus*, L. Very frequent.

31. — *corallinus*, L.

32. *Epicrates cenchria*, L. Rare; called *Giboia*.

33. *Xiphosoma caninum*, L.

34. *Boa constrictor*, L. Frequent; called *Giboia*.

35. *Eunectes murinus*, L. Very frequent; called *Sucurujuba*.

36. *Craspedocephalus atrox*, L. Called *Caisaeca*; frequent, especially near Nazareth on the river Jaquaripa.

37. *Craspedocephalus bilineatus*, Wied. This is a venomous Tree-Snake; it is called *Surucúcú patyoba*, from the palm on which it usually is found; it renders the cutting of the leaves of this palm very dangerous. Another similar snake lives on the Uricana palm, from which its name of *Surucúcú uricana* is derived.

38. *Lachesis mutus*, L. Called *Surucúcú*; it lives in holes together with *Cœlogenyx paca*, and is very dangerous to the dogs used in shooting the latter.

39. *Crotalus horridus*, L.

I add the description of the new species of Snakes, and of a new Lizard, sent by Dr. Wucherer to the British Museum.

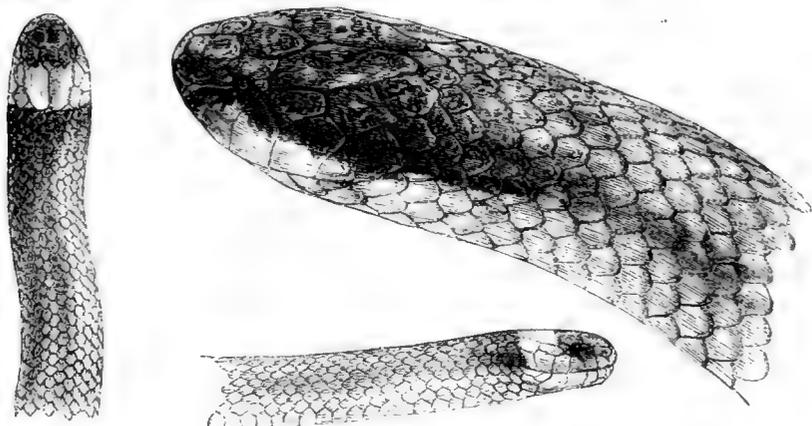
#### ELAPOMORPHUS WUCHERERI.

Six upper labial shields, the second and third of which enter the orbit; two posterior oculars. Scales in fifteen rows; ventral shields 181–208. Reddish-olive (in spirits); head black, with a yellow band across the occipitals; sometimes with three dark longitudinal lines. Very old specimens uniformly coloured, the head being dirty light brown.

*Hab.* Bahia.

*Description.*—This species has a very slender body, whilst the tail is comparatively short. The head is depressed and obtuse, like that of an *Elaps*. Rostral shield of moderate extent, not reaching to the upper surface of the head. Anterior frontals one-third only of the size of the posterior ones; vertical subhexagonal, somewhat longer than broad; occipitals large. Nasal shield oblong, occupying the place of a loreal; one anterior, two posterior oculars. Two temporal shields, one behind the other, the anterior in contact with the oculars. Six upper labial shields, the second produced upwards and backwards so as to enter the orbit, the third immediately below the eye. Lower labials seven or eight, the fourth and fifth being very

large. Two pairs of chin-shields; two or three pairs of scale-like shields between the chin-shields and the ventral plates. Scales smooth, polished, rhombic, in fifteen rows. Ventral shields 206-208;



anal bifid; subcaudals 33-47. Dr. Wucherer has found in a very large specimen 181 ventral and 32 subcaudal shields.

Specimens of 19 inches length are reddish-olive in spirits, with a darker line along the vertebral series of scales. In a specimen in which this line is very distinct, another similar line is to be seen along each side of the body, between the fourth and fifth outer series of scales. Smaller specimens have those lines still more distinct. The head and the anterior portion of the nape are brownish-black, with a broad yellow band across the occipitals and temporals to the side of the mouth. The lower parts are yellowish. Very large specimens are of a uniform bright gamboge-yellow, the head being dirty light brown, gradually becoming lighter posteriorly; there are some greyish-ash irregular spots on the side of the head and under the chin, and some minute irregular grey spots on the sides of the belly and on the outermost rows of scales.

The posterior maxillary tooth is grooved.

Two specimens were taken at Ilhéos; one is 18 and one 19 inches long. Another large specimen, of which a sketch has kindly been communicated to me by Dr. Wucherer, is from the same place; it was captured on an open piece of ground before the house of a Cacao-planter, situated some 60 feet above the level of the river and perfectly dry; its total length is 4 feet 5 inches, and the length of the tail  $4\frac{1}{2}$  inches. Its habit is stouter than that of the younger specimen, and it appears to me to be a female.

#### TRACHYCYCLUS SUPERCILIARIS. (IGUANIDÆ.)

?? *Proctotretus talsneri*, Berthold, Gött. Nachr. 1859, p. 179.

Occipital plate of moderate size, as large as the eye. Above uniform brownish-olive (in spirits), yellowish below, a brown band along the lower side of the thigh and before the vent.

*Hab.* Bahia.

*Description.*—The head is slightly depressed, of moderate width,

the snout is as broad as long. The whole of the upper surface is covered with small, irregular shields, that in the middle of the occiput being the largest, about as large as the eye. The superciliary margin is sharply prominent, continued into the canthus rostralis, and formed by imbricate pointed scales, the point of which is directed backwards. The eyelids are entirely covered with small granular scales. The nostril is situated near the extremity of the snout, before the canthus rostralis, and separated from it by a shallow groove; it is in a single convex shield. The upper and lower labial shields are narrow, and there are two or three other series of small shields, running above, and parallel to, the upper labials, and covering the loreal region. The lower of those series extends to below the eye. The neck and the temporal region are covered with small keeled scales. The opening of the ear is large, subtriangular, and its anterior margin is provided with six or seven tooth-like plates. The scales on the lower side of the head are small, smooth, and become smaller on the throat, where they form a very indistinct collar. There are two oblique, deep folds on the side of the neck, between tympanum and shoulder.

The back is covered with keeled scales of moderate size, the keels terminating in small spines, and forming lines which converge from both sides towards the vertebral line. There are seventeen longitudinal lines of keels across the back between the shoulder-joints and fifteen between the hip-joints. The scales on the upper parts of the limbs are more sharply keeled and more spiny than those on the back. The tail is of moderate length, depressed on its base, and slightly compressed on its middle; it is surrounded by rings of scales, which are much larger than those of the body, each terminating in a prominent spine.

The scales on the belly are rather small and smooth, disposed in transverse series; there are about twenty longitudinal series across the breast between the front limbs; the scales on the lower parts of the limbs are smooth, except those on the soles of the feet and toes, which again are strongly keeled. There are no femoral or anal pores. Palatine teeth none.

All the upper parts are brownish-olive; the lower dull yellowish, with indistinct greyish reticulated lines; the region before the vent is deep brown, and a band of the same colour runs along the lower side of the thigh.

	in.	lin.
Length of the snout (to the anterior angle of the orbit) . . . . .	0	4
Length of the head (to the anterior margin of the tympanum) . . . . .	0	10
Greatest width of the head . . . . .	0	8½
Distance of the anterior angles of the orbits . . . .	0	4½
Length of the trunk (from tympanum to vent) ..	2	6
——— of the tail . . . . .	5	0
——— of the fore limb . . . . .	1	9
——— of the hind limb . . . . .	2	6

	in.	lin.
Length of the fourth finger (from the base of the fifth).....	0	7
— of the fourth toe (from the base of the fifth).....	1	0
Total length.....	8	4

4. DESCRIPTION OF A NEW SPECIES OF WATER-HEN (*GALLINULA*) FROM THE ISLAND OF MAURITIUS. BY ALFRED NEWTON, M.A., F.L.S., F.Z.S.

A small collection of birds recently sent from Mauritius by my brother, Mr. Edward Newton, Assistant Colonial Secretary in that island, and a Corresponding Member of this Society, contains a single specimen of a Water-hen which I am led to consider as distinct from the common *Gallinula chloropus*, with which it has hitherto been confounded. To this conclusion I am chiefly induced by the weight I attach to my brother's opinion, which is decidedly in favour of regarding it as different from our own familiar bird; for, though it must be confessed that the differences observable in the dried skin are but slight, they are perhaps not more so than are to be found in other generally recognized species of the restricted genus *Gallinula*—as, for instance, *Gallinula galeata* of the New World and *G. tenebrosa* of Australia. The peculiarities, however, of the Mauritian bird seem to be constant; and I may perhaps be excused for stating my belief that in cases where we find an animal from any certain locality always presenting an appearance easily to be recognized, we are justified in distinguishing it by a specific name.

In addition to the characters of the Mauritian Water-hen, which I shall presently describe, I may add that my brother informs me that its cry is altogether different from that of our own bird, with which he is well acquainted; and I must remark that this is also the case with respect to the American species (*G. galeata*).

Mr. Gould has kindly enabled me to exhibit an example of this new species, which he received through Mr. Barclay from the Mauritius many years ago; and, as may be seen, it exactly resembles my brother's specimen in the peculiarities I have to point out. At the same time I am indebted to Mr. J. H. Gurney for the opportunity of showing that these peculiarities are not shared by the Water-hen of South Africa, as the bird on the table, from the collection recently sent to that gentleman by Mr. C. J. Andersson from Damara Land, does not differ, that I can see, from our own *G. chloropus*.

In an admirable series of articles on the ornithology of Madagascar, lately contributed by Dr. Hartlaub to the 'Journal für Ornithologie,' mention is made of a *Gallinula* in the collection at Vienna, killed by Bojer on the east coast of that island, which is stated to have "ocherfarbenen Unterschwanzdecken." Hence I should be disposed to presume that the Mauritian form is found in the neighbouring and larger island, and perhaps indeed is common and peculiar to

the whole Mascarene group, as Dr. Hartlaub, quoting the authority of M. Victor Sganzin (whose paper, by the by, in the 'Mémoires de la Société d'Histoire Naturelle de Strasbourg,' I have not been able to examine), states that it is common in Bourbon (Réunion) as well as in Mauritius.

I now proceed to designate the new species in proper form :—

*GALLINULA PYRRHORHOA*, sp. nov.

*Fulica chloropus*, Julien Desjardins, P. Z. S. 1831, p. 45.

"*Gallinula chloropus*, V. Sganzin, Mém. Soc. d'Hist. Nat. Strasb. 1831-2, p. 45;" G. Hartlaub, Journ. für Orn. 1860, p. 173.

*Gallinule or Moor-hen*, auct. anon. in 'Mauritius Register,' 1859, p. lxxxv.

*Gallinula* — (?), 'Ibis,' 1861, p. 116.

*Statura et aspectu Gallinulæ chloropodi admodum similis, sed membrana frontali majore, caudæ tectricibus inferioribus ceruinis, pedibusque flavis.*

*Hab.* In insulis Mascarenis, Mauritiana, Borbonica (teste Sganzin) atque Madagascariensi (teste Bojer); differt voce a *G. chloropode*.

*Mus.* Vindobon., Joh. Gould necnon A. et E. Newton.

##### 5. NOTICE OF THE OCCURRENCE OF THE PINK-FOOTED GOOSE, *ANSER PHENICOPUS*. BY A. D. BARTLETT.

On the 8th of January 1839 I had the pleasure of introducing to the notice of the Society's Meeting this species for the first time as a new British bird; and although since that period many examples have been from time to time obtained, I am not aware that they have appeared in such large numbers as they now appear. Since the 3rd of this month upwards of a hundred specimens have been seen and examined by me, most of them having been killed in the Eastern Counties. The old males weigh about 6 lbs., the females 5 lbs., and young birds 4 $\frac{3}{4}$  lbs. The length of the males is about 2 feet 6 inches, the females 2 feet 3 inches, measuring from tip of bill to end of tail. The length of the bill varies from 2 $\frac{1}{4}$  inches to 1 $\frac{5}{8}$  in length. I mention this, as too much importance has been attached to this character (in the Geese), which has led Mr. A. Strickland to regard and describe the old male Bean-Goose as a new and distinct species\*. Of this latter bird I here exhibit an *old male* whose bill is upwards of 2 $\frac{3}{4}$  inches long. I also exhibit a female Bean Goose, bill 2 $\frac{1}{4}$  inches long; this latter is an adult female, having been kept in the Gardens of this Society nearly two years.

\* See Ann. and Mag. N. H. ser. 3, vol. iii. p. 121, where the old male Bean-Goose (*Anser segetum*) is described as a new species under the name of the Long-billed Goose (*Anser paludosus*).

6. DESCRIPTIONS OF FORTY-SEVEN NEW SPECIES OF LAND-SHELLS, FROM THE COLLECTION OF H. CUMING, ESQ. BY DR. L. PFEIFFER.

(Plates II. & III.)

1. *HELIX TROCHISCUS*, Pfr. *T. imperforata, conica, solidula, lævigata, nitidissima, pellucida, cornea; spira convexo-conica; sutura submarginata; anfr. 5½ convexiusculi, ultimus rotundatus, non descendens; apertura subverticalis, lunaris; perist. simplex, rectum, marginibus remotis, columellari brevi, substricto, calloso-subincrassato.*

Diam. maj. 5, min.  $4\frac{1}{2}$ , alt.  $4\frac{1}{4}$  mill.

*Hab.* Siam (*M. Mouhot*).

2. *HELIX IGNESCENS*, Pfr. (Pl. II. fig. 1). *T. subperforata, globoso-depressa, vitrinoidea, tenuis, striatula et striis impressis spiralibus sub lente decussatula, pellucida, nitidissima, corneo-ignescens; spira parum elevata; anfr. 4½ rapide accrescentes, convexiusculi, ultimus ventrosus, non descendens; apertura fere diagonalis, rotundato-lunaris; perist. simplex, rectum, marginibus vix conniventibus, dextro antrorsum subarcuato, columellari arcuato-declivi, filari, superne anguste reflexo.*

Diam. maj.  $27\frac{1}{2}$ , min. 23, alt. 15 mill.

*Hab.* Isle of Batchian, Moluccas (*Mr. Wallace*).

3. *HELIX SUBCORNEA*, Pfr. *T. subclausa perforata, depressa, tenuis, lævigata, albido-cornea; spira vix conoideo-elevata, vertice subtili; sutura filo marginata; anfr. 7½ convexiusculi, ultimus vix latior, basi convexior; apertura verticalis, auriformi-lunaris; perist. simplex, rectum, margine columellari longe declivi, subincrassato.*

Diam. maj.  $13\frac{2}{3}$ , min.  $12\frac{1}{2}$ , alt. 6 mill.

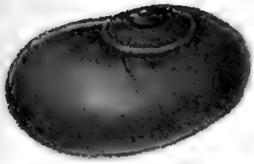
*Hab.* Siam (*M. Mouhot*).

4. *HELIX CÆSIA*, (*NANINA*) Pfr. *T. perforata, depressa, tenuis, pellucida, corneo-grisea, superne striatula, parum nitens, sub lente lineis spiralibus sculpta, subtus radiato-striata, nitidior; spira breviter conoidea, vertice subtili; sutura levis; anfr. 6 planiusculi, regulariter accrescentes, ultimus medio subcarinatus, basi convexiusculus; apertura obliqua, late lunaris; perist. simplex, rectum, marginibus remotis, columellari declivi, ad insertionem vix dilatato.*

Diam. maj. 17, min.  $15\frac{1}{2}$ , alt. 8 mill.

*Hab.* Admiralty Islands.

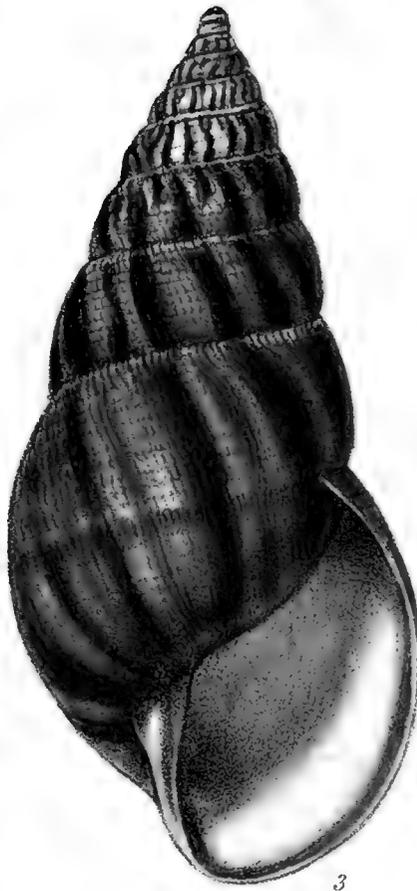
5. *HELIX FARADENSIS*, Pfr. *T. anguste umbilicata, depresso-turbinata, solidula, superne arcuato-striata, lineisque spiralibus sub lente conspicuis sculpta, lutescenti-cornea; spira conoidea, vertice minuto; anfr. 5 convexiusculi, ultimus latus, rotundatus, subtus radiato-striatus, nitidior; apertura obliqua, rotundato-*



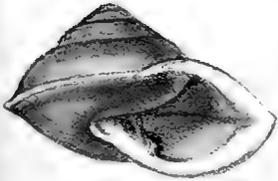
1



2



3



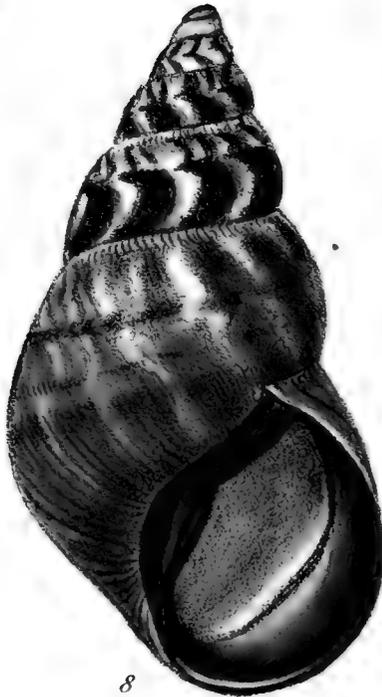
4



5



7



8



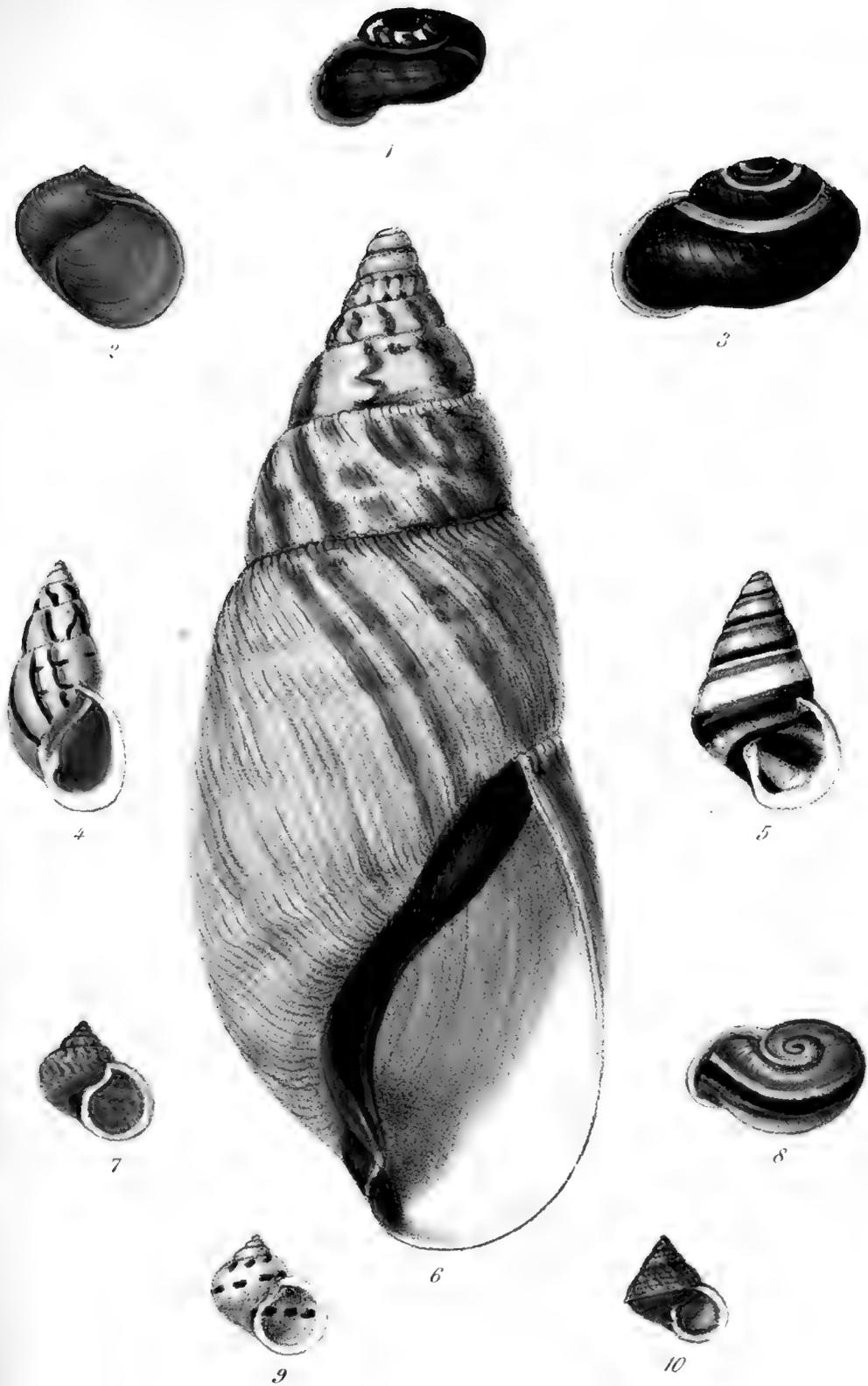
6

G. B. Sowerby, lith.

Vincent Brooks Imp

1. *Helix ignescens*. 2. *Pythia wallacii*. 3. *Limicolaria turris*.  
4. *Helix nodifera*. 5. *H. batchianensis*. 6. *Helix rhyncostoma*.  
7. *Clausilia taylori*. 8. *Orthalicus mars*.

BRITISH MUSEUM  
1851



G. B. Sowerby, lith.

Vincent Brooks, Imp

1. *Cyclotus batchianensis*. 2. *Simpulopsis cumingi*. 3. *Helix atro-fusca*  
 4. *Bulimus hepatostomus*. 5. *Bulimus pan.* 6. *Achatina planti*  
 7. *Leptopoma pulicarium*. 8. *Helix expansa*. 9. *Leptopoma globulosum*  
 10. *L. decipiens*

BRITISH MUSEUM

NATURAL HISTORY

*lunaris, intus submargaritacea; perist. simplex, rectum, marginibus vix convergentibus, columellari superne subdilatato.*  
 Diam. maj. 20, min. 17, alt. 12 mill.  
*Hab.* Parada, Mexico (M. Sallé).

6. *HELIX CARMELIENSIS*, Pfr. *T. anguste umbilicata, depressa, tenuis, sublævigata, pellucida, cornea, rufo indistincte radiata; spira convexa; anfr. 4½ convexiusculi, lente accrescentes, ultimus rotundatus, non descendens; apertura obliqua, lunaris; perist. simplex, rectum, marginibus distantibus, columellari superne vix dilatato.*

Diam. maj.  $3\frac{1}{3}$ , min. 3, alt. vix 2 mill.

*Hab.* Mount Carmel.

7. *HELIX GASSIESI*, Pfr. *T. umbilicata, discoidea, carinata, tenuis, arcuato-striata et lineis impressis obliquis sub lente decussatula, nitida, lutescens, flammis crebris castaneis fulgurata; spira immersa; anfr. 4 convexiusculi, rapide accrescentes, ultimus magnus, utrinque convexior, medio subacute carinatus; apertura obliqua, subtriangulari-lunaris; perist. simplex, acutum, marginibus conniventibus.*

Diam. maj.  $8\frac{1}{3}$ , min.  $7\frac{1}{3}$ , alt. 3 mill.

*Hab.* Erumanga, New Hebrides (Mr. Turner).

8. *HELIX BATCHIANENSIS*, Pfr. (Pl. II. fig. 5). *T. angustissime umbilicata, conoidea, solida, oblique striata, fusca; spira convexo-conoidea, apice acutiuscula; sutura levis, carinato-marginata; anfr. 7, supremi plani, sequentes convexiusculi, ultimus carinatus, non descendens, basi profunde excavatus; apertura diagonalis, rotundato-lunaris; perist. rectum, marginibus distantibus; dextro subsimplici, basali incrassato, ad insertionem flexuose ascendente.*

Diam. maj.  $20\frac{1}{2}$ , min.  $18\frac{1}{2}$ , alt.  $11\frac{1}{2}$  mill.

*β. Major, anfr. 8½, ultimo infra carinam præcedentis recedente.*

Diam.  $23\frac{1}{3}$ , alt. 14 mill.

*Hab.* Isle of Batchian (Mr. Wallace).

9. *HELIX RHYNCHOSTOMA*, Pfr. (Pl. II. fig. 6). *T. anguste umbilicata, trochiformis, acute carinata, tenuiuscula, striatula et sub lente minutissime granulata, carnea, fasciis 2 rufis, altera supera, altera latiore basali ornata; spira conica, obtusiuscula; sutura carinato-marginata; anfr. 6 subplani, lente accrescentes, ultimus antice vix descendens, basi subplanus; apertura perobliqua, subtriangularis; perist. tenue, marginibus distantibus, supero vix expanso, ad dextram in rostrum reflexo, basali breviter reflexo, columellari dilatato, umbilicum occultante.*

Diam. maj. 25, min. vix 22; alt. 17 mill.

*Hab.* Isle of Batchian (Mr. Wallace).

10. *HELIX NODIFERA*, Pfr. (Pl. II. fig. 4). *T. umbilicata, trochiformis, carinata, tenuiuscula, striatula, diaphana, pallide lu-*

*tescens*; spira conoidea, apice acutiuscula; sutura levis; anfr. 5 convexiusculi, ultimus non descendens, medio acute albo-carinatus, utrinque convexior; apertura diagonalis, subrhombea; perist. late expansum, marginibus subparallelis, columellari supra umbilicum angustum fornicatim reflexo, intus nodulo circumscripto munito.

Diam. maj. 30, min. 24, alt. 18 mill.

*Hab.* Isle of Batchian (Mr. Wallace).

11. **HELIX OCCULTA**, Pfr. *T. anguste umbilicata, globoso-depressa, tenuis, sub lente undique tenuissime granulata, fuscule; spira vix elevata; anfr. 4 convexiusculi, ultimus latus, antice deflexus et subconstrictus, basi ventrosior; apertura magna, obliqua, lunato-ovalis; perist. albo-callosum, marginibus approximatis, dextro expanso, basali reflexo, supra umbilicum dilatato.*

Diam. maj. 12, min. 10, alt. 7 mill.

*Hab.* Aru Islands (Mr. Wallace).

12. **HELIX ATROFUSCA**, Pfr. (Pl. III. fig. 3). *T. umbilicata, depressa, tenuiuscula, conferte striata, atro-fusca, fascia unica suturali lutescente ornata; spira conoideo-convexa, vertice corneo; anfr. 4½ convexi, rapide accrescentes, ultimus depresso-rotundatus, antice leviter descendens, circa umbilicum mediocrem excavatus; apertura ampla, diagonalis, lunato-ovalis, intus margaritacea, coloribus perlucetibus; perist. album, late expansum et reflexiusculum, marginibus convergentibus, columellari superne dilatato, tunc intus tuberculo rotundato munito.*

Diam. maj. 32, min. 25, alt. 15 mill.

*Hab.* Isle of Batchian (Mr. Wallace).

13. **HELIX EXPANSA**, Pfr. (Pl. III. fig. 8). *T. umbilicata, depressa, tenuis, striatula, superne vix nitidula, carnea, antrorsum cinnamomea; spira plana, subimmersa; anfr. 4 convexiusculi, rapide accrescentes, ultimus magnus, depresso-rotundatus, antice vix descendens, subtus distinctius striatus, albidus, nitidus, pone aperturam gibboso-inflatus et constrictus; apertura ampla, perobliqua, lunato-circularis; perist. tenue, marginibus convergentibus, dextro horizontaliter abeunte, late expanso, basali reflexo.*

Diam. maj. 22, min. 17½, alt. 10 mill.

*Hab.* Isle of Batchian (Mr. Wallace).

14. **HELIX LEUCOTROPIS**, Pfr. *T. anguste umbilicata, depressa, solidula, conferte striatula, nitidula, carnea; spira breviter conoidea; sutura albo-marginata; anfr. 4½ convexiusculi, ultimus carina compressa, acuta, alba munitus, antice vix descendens, basi convexior; apertura obliqua, subrhombico-lunaris; perist. tenue, marginibus convergentibus, supero breviter expanso, basali reflexo, ad insertionem dilatato.*

Diam. maj. 18, min. 15, alt. 8 mill.

*Hab.* Aru Islands (Mr. Wallace).

15. STREPTAXIS SINUOSA, Pfr. *T. profunde arcuato-rimata, oblique oblonga, tenuiuscula, lævigata, nitida, vitreo-albida; spira subconoidea, vertice valde excentrico, minuto; anfr. 5½ convexiusculi, ad suturam striatuli, penultimus gibbosus, ultimus antrorsum aberrans, loco umbilici profunde excavatus; apertura diagonalis, late lunaris, lamina parva linguæformi parietali coarctata; perist. flexuosum, callosum, reflexum, margine dextro superne tenui, sinuoso.*

Diam. maj.  $8\frac{1}{2}$ , min.  $6\frac{1}{3}$ , alt. 5 mill.

Hab. Cochin China.

16. STREPTAXIS EBURNEA, Pfr. *T. oblique perforata, subglobosa, superne minute striata, eburneo-albida; spira convexo-conica; anfr. 6½ parum convexi, 1½ ultimi antrorsum deviantes, ultimus inflatus, lævigatus; apertura perobliqua, subtriangulari-lunaris, dente linguæformi parietali coarctata; perist. callosum, album, expansum et reflexum, margine supero intus dente 1 acuto munito.*

Diam. maj. 11, min. 9, alt. 7 mill.

Hab. Cochin China.

17. BULIMUS PAN, Pfr. (Pl. III. fig. 5). *T. perforata, conico-ovata, solida, lævigata, nitida, alba, fasciis nigro-castaneis ornata; spira conica, sursum fulvicans, apice obtusa; anfr. 5½ planiusculi, ultimus spira brevior, medio carinatus (carina antice evanescente), basi rotundatus; apertura subverticalis, truncato-ovalis; perist. tenue, margine dextro superne sinuato, tum sublata patente, columellari stricte ascendente, fornicatim reflexo.*

Long. 30, diam. 16 mill.

Hab. Philippine Islands.

18. BULIMUS HEPATOSTOMUS, Pfr. (Pl. III. fig. 4). *T. perforata, subfusiformi-oblonga, solidula, sublævigata, alba, strigis sparsis fuscis signata; spira conica, acutiuscula; sutura submarginata; anfr. 6 modice convexi, ultimus spiram paulo superans, basi subattenuatus; columella verticalis, stricta; apertura vix obliqua, oblonga, intus hepatica, nitida; perist. album, margine dextro breviter expanso, columellari plano, late reflexo.*

Long. 32, diam. 13 mill.

Hab. Mexico (M. Boucard).

19. BULIMUS IODOSTYLUS, Pfr. *T. perforata, oblongo-conica, solidula, rugoso-striata et lineis impressis obliquis minute subgranulata, alba subunicolor vel strigis rufis et castaneis irregulariter picta; spira conica, vertice acuto; anfr. 6 convexiusculi, ultimus spiram vix superans, basi subattenuatus; columella substricta, lilacina; apertura parum obliqua, oblonga; perist. breviter expansum, margine columellari sursum dilatato, reflexo.*

Long. 30, diam. 12 mill.

Hab. Mexico (M. Boucard).

20. *BULIMUS DEMERARENSIS*, Pfr. *T. perforata, ovato-turrita, solidula, striatula, sub lente indistincte decussatula, opaca, albida, strigis fuscis irregulariter notata; spira elongato-conica, acutiuscula; anfr. 6 parum convexi, ultimus  $\frac{1}{3}$  longitudinis superans, subangulatus (angulo antice evanescente); apertura obliqua, truncato-ovalis; perist. breviter expansum, margine columellari arcuato, superne fornicatim reflexo.*

Long.  $20\frac{1}{2}$ , diam. 10 mill.

*Hab.* Demerara.

21. *BULIMUS NILOTICUS*, Pfr. *T. subperforata, inflato-ovata, solida, fuscula, saturate castaneo irregulariter radiata; spira brevis, conica, apice acutiuscula; anfr. 6 convexi, summi lævigati, sequentes minute decussati, ultimus fere  $\frac{2}{3}$  longitudinis formans, inflatus, subplicatus et lineis remotioribus spiralibus subclathratus; apertura vix obliqua, ovalis, intus margaritacea; perist. roseum, marginibus callo crasso junctis, dextro subincrassato, striato, superne subrepando, columellari crasso, substricto, basi angulum indistinctum cum basali formante.*

Long. 118, diam. 60 mill.

*Hab.* Ad fontes Nili Albi (Mr. Petherick).

22. *BULIMUS PYRGISCUS*, Pfr. *T. subperforata, turrita, solidula, levissime striata, albida; spira elongata, apice acutiuscula; sutura profunda; anfr. 9 convexiusculi, ultimus  $\frac{2}{9}$  longitudinis æquans, basi non attenuatus; columella levissime arcuata; apertura vix obliqua, angulato-ovalis; perist. simplex, rectum, margine columellari breviter reflexo, subadnato.*

Long. 13, diam. 3 mill.

*Hab.* Sandwich Islands.

23. *BULIMUS DUX*, Pfr. *T. subobtecte perforata, ovato-conica, solida, irregulariter striata, pallide carnea; spira conica, acutiuscula; sutura marginata; anfr. 6 vix convexiusculi, infra suturam striis spiralibus nonnullis distinctis, pluribusque obsoletis sculpti, ultimus spiram paulo superans, subventrosus, basi rotundatus; apertura subverticalis, angulato-ovalis, intus roseo-carnea, nitida; perist. simplex, rectum, marginibus callo roseo nitido junctis, columellari lilacino-roseo, fornicatim reflexo, subadnato.*

Long. 51, diam. 26 mill.

*Hab.* King George's Sound, Australia.

24. *SPIRAXIS BOUCARDI*, Pfr. *T. ovato-oblonga, tenuis, lævigata, nitida, olivaceo-fusca vel rubello-cornea; spira convexo-conica, obtusula; sutura levis; anfr. 6 planiusculi, ultimus antice descendens,  $\frac{4}{7}$  longitudinis formans, basi rotundatus; lamina columellaris funiculata, torta, non truncata; apertura verticalis, anguste sinuato-semiovalis; perist. simplex, margine dextro medio antrorsum subdilato.*

Long. 17, diam. 7 mill.

*Hab.* Juquila, Mexico (M. Boucard).

25. LIMICOLARIA TURRIS, Pfr. (Pl. II. fig. 3). *T. anguste umbilicata, ovato-turrita, tenuiuscula, conferte striata, striis spiralibus paulo distantioribus granulato-decussata, pallide straminea unicolor vel strigis et flammis rufis variegata; spira turrita, apice obtusula; anfr. 10 modice convexi, ultimus  $\frac{5}{12}$  longitudinis subæquans, ad suturam interdum impresso-marginatus et crenatus, juxta umbilicum subcompressus; columella leviter arcuata, cærulescens; apertura subverticalis, oblonga, basi subeffusa, intus margaritacea; perist. simplex, rectum, margine columellari sursum dilatato, fornicatim reflexo.*

Long. 114, diam. 13 mill.

*Hab.* Ad fontes Nili Albi (Mr. Petherick).

26. ORTHALICUS MARS, Pfr. (Pl. II. fig. 8). *T. imperforata, oblongo-conica, solida, sublævigata, carnea, livido-nebulosa; spira conica, vertice obtuso; sutura crenulata; anfr. 7 modice convexi, medio griseo-violaceo marmorati, ultimus  $\frac{2}{3}$  longitudinis subæquans, antice rugoso-striatus; columella nigra, callosa, torta et plicata; apertura obliqua, ovalis, fundo margaritaceo-alba; perist. rectum, obtusum, intus nigro-limbatum, marginibus callo nigro intrante junctis.*

Long. 77, diam. 35 mill.

*Hab.* In republica Æquatoris (Mr. Fraser).

27. ACHATINA SEMIGRANOSA, Pfr. *T. ovato-turrita, tenuiuscula, lutescens, flammis castaneis fulguratis ornata; spira conica, obtusa; anfr. 7 modice convexi, superiores distincte seriatim granulati, ultimus spiram subæquans, infra medium minutissime decussatus, seriebus granulorum destitutus; columella alba, parum torta, late truncata; apertura vix obliqua, angulato-subelliptica; perist. simplex, acutum.*

Long. 77, diam. 34 mill.

*Hab.* Cape Natal (Mr. Plant).

28. ACHATINA PLANTI, Pfr. (Pl. III. fig. 6). *T. turrito-oblonga, solidula, carneo-albida, fuscule et castaneo irregulariter maculata et flammata; spira ovato-conica, apice rotundata; sutura subcrenata; anfr. 9 convexiusculi, summi minute granulato-decussati, 2 ultimi prope suturam granulati, tum subdistanter plicatuli, ultimus spira brevior, basi subattenuatus; columella levissime recedens, basi oblique truncata; apertura obliqua, angulato-ovalis; perist. simplex, rectum, marginibus callo saturate castaneo, introrsum diffuso, junctis.*

Long. 134, diam. 47 mill.

*Hab.* Cape Natal (Mr. Plant).

29. ACHATINA FOXCROFTI, Pfr. *T. cylindrico-turrita, solidula, irregulariter striatula, sub epidermide cornea decidua albida; spira superne turrita, apice obtusa, tum cylindracea; sutura subcrenulata; anfr.  $12\frac{1}{2}$  convexiusculi, ultimus  $\frac{1}{5}$  longitudinis vix æquans, basi rotundatus; columella antrorsum arcuata, di-*

*stincte et anguste truncata; apertura obliqua, ovalis; perist. simplex, rectum.*

Long. 35, diam.  $6\frac{1}{2}$  mill.

*Hab.* Sierra Leone (*Mr. Foxcroft*).

30. OLEACINA MULTISPIRA, Pfr. *T. ovato-turrita, tenuis, striatula, nitida, cornea, strigis indistinctis pallidis irregulariter notata; spira convexiusculo-turrita, apice acuta; sutura crenulato-marginata; anfr. 10 planiusculi, infra suturam plicatuli, ultimus spira brevior, basi rotundatus; columella brevis, ad basin aperturæ oblique truncata; apertura subverticalis, sinuato-semiovalis; perist. simplex, margine dextro fere angulatim antrosum dilatato.*

Long. 25, diam.  $9\frac{2}{3}$  mill.

*Hab.* Juquila, Mexico (*M. Boucard*).

31. OLEACINA TURGIDA, Pfr. *T. subfusiformi-ovata, solidiuscula, leviter et conferte striata, parum nitida, isabellina; spira conica, apice obtusa; sutura levissime crenulata; anfr. 7 turgidi, summi lævigati, ultimus spira paulo brevior, basi attenuatus; columella stricta, abrupte truncata; apertura verticalis, sinuato-semiovalis, intus rubella; perist. simplex, acutum.*

Long. 30, diam. 12 mill.

*Hab.* Juquila, Mexico (*M. Boucard*).

32. OLEACINA CONFERTA, Pfr. *T. oblongo-ovata, tenuiuscula, conferte plicato-striata, pellucida, nitida, cerea; spira conica, obtusula; sutura submarginata; anfr. 8 convexiusculi, ultimus spiram vix superans; columella arcuata, basi late truncata; apertura subverticalis, acuminato-semiovalis; perist. simplex, margine dextro leviter antrosum arcuato.*

Long. 25, diam. 10 mill.

*Hab.* Juquila, Mexico (*M. Boucard*).

33. OLEACINA SACCATA, Pfr. *T. ovato-oblonga, solidiuscula, fusco-cornea; spira convexo-conica, apice acutiuscula; sutura filo marginata et conferte granulata; anfr.  $6\frac{1}{2}$  convexiusculi, superiores plicato-striati et lineis minutissimis spiralibus decussati, ultimus spira brevior, infra suturam modo plicatulus et decussatus, tum lævigatus, basi saccatus; columella brevis, subtorta, late truncata; apertura subverticalis, sinuato-ovalis, intus margaritacea; perist. simplex, margine dextro antrosum subdilatato.*

Long. 56, diam. 24 mill.

*Hab.* In republica Æquatoriali (*Mr. Fraser*).

34. OLEACINA DECIDUA, Pfr. *T. fusiformis, tenuis, striatula, lineis impressis spiralibus sub lente decussatula, nitida, albida, epidermide griseo-cornea, strigatim decidua variegata; spira conica, obtusa; sutura vix marginata; anfr. 6 convexiusculi, ultimus spiram subæquans, basi attenuatus; columella leviter*

*arcuata, oblique truncata; apertura parum obliqua, subsemi-ovalis; perist. simplex, margine dextro regulariter arcuato.*

Long. 28, diam. 11 mill.

*Hab.* Juquila, Mexico (*M. Boucard*).

35. *CYLINDRELLA MICROSTOMA*, Pfr. *T. subperforata, cylindracea, lævigata, cretacea; spira sursum dilatata, in conum brevem acutiusculum desinens; sutura impressa; anfr. 18 subplani, æquales, summi plicatuli, ultimus striatus, antice solutus, dorso carinatus, basi angulatus, angulo antrorsum evanescente; apertura parvula, verticalis, subtriangularis; perist. undique breviter expansum.*

Long. 15½, diam. 5 mill.

*Hab.* — ?

36. *CLAUSILIA OBESA*, Pfr. *T. arcuato-rimata, ventroso-fusiformis, solidula, conferte striata, sericina, corneo-albida; spira ventrosa, apice acutiuscula; sutura simplex; anfr. 10 convexiusculi, ultimus pone aperturam crista obtusa valida munitus; apertura subverticalis, piriformi-rotundata; lamellæ mediocres, convergentes; lunella arcuata; plica palatalis 1 supera, subcolumellaris conspicua; perist. continuum, superne breviter solutum, intus albo-callosum.*

Long. 14, diam. 4⅔ mill.

*Hab.* In Dalmatia.

37. *CLAUSILIA (BALEA?) TAYLORI*, Pfr. (Pl. II. fig. 7). *T. profunde rimata, turrita, solidula, conferte plicato-striata, corneo-albida; spira regulariter attenuata, apice acutiuscula; sutura simplex; anfr. 11 convexiusculi, ultimus basi vix attenuatus, infra medium obtuse carinatus, antice solutus, descendens et dorso acute carinatus; apertura magna, obliqua, intus semicircularis; lamellæ obsoletæ; plicæ nullæ; perist. continuum, undique late expansum.*

Long. 47, diam. 8½ mill.

*Localitas* ignota.

38. *SIMPULOOPSIS CUMINGI*, Pfr. (Pl. III. fig. 2). *T. subglobosa, tenuissima, leviter et irregulariter plicatula, pellucida, vix nitida, virenti-cornea; spira minuta, in papillam minimam desinens; anfr. 3, ultimus perinflatus; columella regulariter arcuata, simplex; apertura obliqua, rotundato-ovalis, intus nitidissima; perist. simplex, expansiusculum.*

Diam. maj. 20½, min. 19½, alt. 12 mill.

*Hab.* Mexico.

39. *SIMPULOOPSIS ÆNEA*, Pfr. *T. conico-globosa, tenuis, confertissime striata, pellucida, æneo-micans, olivaceo-cornea; spira brevis, conica; anfr. 2½, superus convexus, ultimus inflatus; apertura diagonalis, ovalis, intus nitidior; columella filaris;*

*perist. simplex, rectum, marginibus callo tenuissimo albido junctis.*

Diam. maj. 9, min. 8, alt.  $5\frac{1}{2}$  mill.

*Hab.* La Parada, Mexico (*M. Sallé*).

40. SUCCINEA SCALARINA, Pfr. *T. ovato-conica, scalarina, solidiuscula, irregulariter rugoso-plicata, nitidula, rubella; spira elongata, acutiuscula; anfr.  $3\frac{1}{2}$  convexi, ultimus spiram paulo superans, basi subattenuatus; columella substrictè recedens, cum perist. angulum indistinctum formans; apertura obliqua, ovalis, superne vix angulata; perist. simplex, margine columellari superne reflexiusculo.*

Long. 13, diam.  $7\frac{1}{2}$ , alt.  $5\frac{1}{3}$  mill.

*Hab.* King George's Sound, Australia.

41. PYTHIA WALLACII, Pfr. (Pl. II. fig. 2). *T. imperforata, compressè ovato-acuminata, solidiuscula, leviter striata, lutescens, punctis castaneis dense conspersa vel subunicolor castanea; spira conica, acuminata, lateribus angulata, varicibus pallidis; sutura levis, indistincta; anfr. 9-10 planiusculi, ultimus  $\frac{3}{5}$  longitudinis fere formans; apertura vix obliqua, angustissima; plicæ parietales 3, suprema verticaliter descendens, angulatim retroflexa, secunda magna, linguæformis, tertia minuta, illi parallela; plica columellaris valida, torta, subadscendens; perist. callo dentifero munitum (dentibus 2 majoribus, tertio minuto), superne simplex, tum expansum et tenuiter reflexum.*

Long. 23, diam. maj. 14, min. 10 mill.

*Hab.* Isle of Batchian (*Mr. Wallace*).

42. CYCLOTUS SUBFLAMMULATUS, Pfr. *T. umbilicata, turbinate-depressa, tenuiuscula, striatula, nitida, lutescens; spira breviter conoidea; anfr. 4 modice convexi, supremi pallide rufo-flammulati, ultimus depresso-rotundatus, non descendens; umbilicus conicus,  $\frac{1}{3}$  diametri vix superans; apertura vix obliqua, subcircularis, intus margaritacea; perist. duplex, internum vix porrectum, externum patens, superne productum, latere columellari angusto.*

Diam. maj. 17, alt.  $8\frac{1}{2}$  mill.

*Hab.* Isle of Batchian (*Mr. Wallace*).

43. CYCLOTUS BATCHIANENSIS, Pfr. (Pl. III. fig. 1). *T. late umbilicata, subdiscoidea, solida, oblique striatula et superne liris spiralibus obsoletis notata, saturate fusca; spira vix prominula; anfr. 4 convexiusculi, supremi pallide flammulati, ultimus depresso-rotundatus, antice descendens; apertura diagonalis, subangulato-rotunda; perist. duplex, internum continuum, subadnatum, latere dextro dilatatum, externum album, concentricè striatum, superne valde productum, juxta anfr. contiguum subcompressum, latere dextro et basali expansis, columellari angusto.*

Diam. 23, alt.  $8\frac{1}{4}$  mill.

*Hab.* Isle of Batchian (*Mr. Wallace*).

44. *CYCLOPHORUS PAPHIUS*, Pfr. *T. sublate umbilicata, convexo-depressa, solida, striata, alba, maculis castaneis sagittiformibus et fascia subcontinua infra peripheriam ornata; spira convexa, obtusula; sutura distincte filomarginata; anfr. 5 convexi, ultimus basi albus; apertura fere diagonalis, subcircularis; perist. duplex: internum continuum, breviter adnatum, externum superne dilatatum et subinflexum, latere dextro et sinistro patens.*

Diam. maj. 25, min. 20, alt. 13 mill.

Localitas ignota.

45. *LEPTOPOMA PULICARIUM*, Pfr. (Pl. III. fig. 7). *T. perforata, globoso-turbinata, tenuiuscula, striis spiralibus confertissimis undulatis sculpta, carnea, punctis rufulis (interdum fulguratim confluentibus) dense conspersa; spira turbinata, apice acutiuscula, cornea; anfr. 5 convexi, ultimus inflatus; apertura obliqua, ovali-subcircularis; perist. album, tenue, breviter subinterruptum, margine dextro æqualiter patente, sinistro medio dilatato, reflexo.*

Diam. maj. 15, min. 12, alt. 12 mill.

Hab. Isle of Batchian (Mr. Wallace).

46. *LEPTOPOMA GLOBULOSUM*, Pfr. (Pl. III. fig. 9). *T. perforata, conico-globosa, tenuiuscula, striis spiralibus confertissimis sculpta, albida, seriebus nonnullis macularum fuscaram cincta; spira turbinata, acutiuscula; anfr. 4½ convexi, ultimus valde inflatus; apertura parum obliqua, multo altior quam lata; perist. album, vix interruptum, margine dextro æqualiter patente, sinistro medio subdilatato, reflexo.*

Diam. maj. 13½, min. 11¼, alt. 10¼ mill.

β. *Albidum, maculis magnis castaneis irregulariter pictum, liris nonnullis filaribus superne sculptum.*

Hab. Isle of Batchian (Mr. Wallace).

47. *LEPTOPOMA DECIPIENS*, Pfr. (Pl. III. fig. 10). *T. perforata, globoso-conica, subcarinata, tenuiuscula, sub epidermide olivaceo-fusca squamosa albida, nitida; spira elevato-conica, apice acutiuscula, aurantiaca; anfr. 6 convexiusculi, oblique striati et liris filiformibus subremotis cincti; apertura diagonalis, lunato-ovalis; perist. album, interruptum, margine dextro descendente, patente, sinistro superne sinuato, tum vix dilatato.*

Diam. maj. 11½, min. 10, alt. 10 mill.

Hab. Isle of Batchian (Mr. Wallace).

January 22nd, 1861.

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

Dr. P. L. Sclater called the attention of the meeting to an important addition lately made to the Society's Menagerie. On the 18th instant Her Majesty the Queen had transferred to the Society's care a female of the Ælian's Wart-Hog (*Phacochoerus æliani*, Rüpp. Atlas, i. pl. 25), which had been lately received from Bathurst in Western Africa by the steamer 'Armenian,' as a present to Her Majesty from the King of Ashantee, through the Governor of the Gold-coast. This species was stated to be distinguishable from the Wart-Hog of Southern Africa (*P. æthiopicus*), of which the Society already possessed a specimen, by the presence of two upper incisor teeth (which are wanting in *P. æthiopicus* when adult), as well as by other very noticeable external characters.

Dr. Sclater also exhibited a specimen of the American Meadow-Starling (*Sturnella ludoviciana*), shot in Suffolk a short time since, and lent to him by the Rev. Henry Temple Frere, of Burston Rectory, for examination. This was the first instance of the occurrence of this bird in Europe.

A letter was read, addressed to Dr. Sclater by Dr. G. Bennett, F.Z.S., relative to a singular Grallatorial bird living in an aviary in Sydney in November 1860, which had been brought from New Caledonia by M. Des Planches. A drawing of the bird was also exhibited, which was stated by Dr. Sclater to represent the same species as that lately described in France as *Rhinochetus jubatus*, and referred by its describers (MM. DesMurs and J. Verreaux) to the family *Ardeidæ*.

The Secretary read the following extract from a letter addressed to him by Captain John M. Dow, Corr. Memb., dated "U.S. Mail-steamer 'Guatemala,' Panama Bay, December 7th, 1860:"—

"Some time since, while in the Bay of La Union, State of San Salvador, I caught, or rather should say shot with my gun, having no other means at hand, a couple of what I supposed was *Anableps tetrophthalmus*; but upon sending them to my friend Professor Baird of the Smithsonian Institution at Washington, was somewhat surprised and gratified to hear they were of an entirely new species,—gratified because honoured with having my name given to this singular fish, which has been called *A. dowii*.

"On our voyage just ended, at the request of Professor Baird, who desires to distribute them to different Museums, I captured a half-dozen or so more of these fishes, one of which I left out for dissection; fortunately this proved to be a female. With the assistance of Dr. J. Taylor Crook, the Surgeon of the steamer, a sufficient satisfactory dissection was made to justify me in announcing a most remarkable peculiarity, which I have never before seen noticed in any work, in the reproduction of this species. It is well known that this

genus of fishes give birth to their young alive. An incision made in the abdomen of the one under consideration established the fact; for three young ones were found within it, and all of them in different stages of development. The first we removed was fully developed in all its parts, but still had the placenta attached to its belly, but altogether detached from the parent, and evidently in condition to be discharged from the parent in a couple of days. The second was intermediate in its development to the one just described and the third. In the latter the abdominal suture was not yet closed, neither was the black transverse band which divides into two parts the cornea and iris of the eyes of this genus (which band was perfect in the first-mentioned young one, and not entirely perfect in the second) at all developed. I think this observation fully establishes the entirely viviparous (not ovo-viviparous as most writers have it) nature of the genus. Does not also the singular fact of the young being found in intermediate stages of development within the parent present a strange anomaly in the history of viviparous reproduction—an undeniable argument against the generally accepted opinion of the laws which are supposed to govern the reproduction of species in animal life? Of the above fact I desire no further evidence. Whether it is of that importance to the scientific world which my imperfect relation above would imply, I leave for others, more deeply versed in such investigations, to decide.”

The following papers were read :—

1. NOTES ON A COLLECTION OF BATS MADE BY MR. ANDERSSON IN THE DAMARA COUNTRY, SOUTH-WESTERN AFRICA, WITH NOTICES OF SOME OTHER AFRICAN SPECIES. BY ROBERT F. TOMES, CORR. MEMB. ZOOL. SOC.

Through the kindness of J. H. Gurney, Esq., M.P., I have been enabled to examine a very interesting, though not very extensive, collection of Bats, made by Mr. Andersson in South-western Africa during the year 1859. It contains three new species; and I propose, when describing them, to add notices of some others previously collected by Mr. Andersson at Lake Ngama, and of one or two species which, although already well known, may, from their affinity with some of those in the present collection, be advantageously introduced here. To prevent any confusion regarding the species forming the collection recently received from Mr. Andersson, they may be mentioned here, as follows:—*Kerivoula argentata*, n. s., *Nycticejus planirostris*, Peters, *Scotophilus minutus*, Temm., *S. rusticus*, n. s., and *S. variegatus*, n. s.

The remaining species mentioned in this paper are—*Scotophilus capensis*, from the Cape of Good Hope, collected by M. Verreaux, *Miniopterus schreibersii* and *Molossus limbatus*, both collected by Mr. Andersson at Lake Ngama, and *Scotophilus kuhlii*, collected in Algeria by the Rev. H. B. Tristram.

## KERIVOULA ARGENTATA, N. S.

In the Proceedings of this Society for 1858 I described at some length the peculiarities of the present group of Bats, giving my reasons for regarding these peculiarities as generic. All that was stated respecting the several species then enumerated may with equal exactness be said of the present one; and I may add that I have since that time again examined the fine collection of Bats in the Leyden Museum, and that, with the exception of identifying my specimens of *K. papillosa* with the *Vespertilio papillosus* of M. Temminck, and examining a specimen of my *K. ærosa*, labelled "Gorontalo," I saw nothing which in any way either confirmed or modified my previous opinions of the genus.

The present species is of larger size than either of the African species before described, fully equal in size to the *K. papillosa*, and in the colour of its fur it differs from all the other species.

Compared with the African species which it most nearly resembles, it possesses some of the characters of both *K. lanosa* and *K. ærosa*.

The top of the head is elevated in about the same degree as in *K. ærosa*; and it greatly resembles this species in the shape of the muzzle and the distribution of the hair on the face; but in the shape of the ears it approaches more nearly to *K. lanosa*, differing from it only in having the inner rounded margin toward the top of the ears more prominent even than in that species. The tragus is remarkably narrow, and tapers evenly to an exceedingly acute point; near the bottom of its outer edge is a narrow notch, or rather slit, and below it a small and pointed process, which is placed, in fact, immediately above what may be called the foot-stalk or narrow root of the tragus. Inside the ear, and vertically beneath the tragus, is a well-defined fleshy tubercle, of a flattened form, and about one line in length.

In the quantity and distribution of the fur on the membranes, this species is intermediate between *K. lanosa* and *K. ærosa*, but it has fewer adpressed hairs on the wings than either. The fur of the back extends on to the membranes of the flanks a little, and on to the interfemoral membrane in a scattered manner, but more thickly on to the tibiæ and feet, especially on to the latter, which are well clothed. Beneath, it extends a little on to the membranes near the sides of the body. The *os calcis* is well clothed with short adpressed hairs; and between it and the tail-tip the membrane is fringed with closely-set hairs, which curve downwards and have a comb-like appearance, as in *K. lanosa*.

The fur is everywhere long and silky; that of all the upper parts is of four colours—at the root very dark grey for a fourth of its length, then yellowish, passing into a pale but bright rust-colour, and the tips of the hairs of a shining and silvery white. There is very little variation in the colouring of the different parts of the upper surface. Beneath, the fur is unicoloured and dirty-white, on the sides of the neck and on the cheeks tinged with rust-colour.

The teeth, as far as may be gathered from inspection without re-

moving the skull from the specimen, are like those of *K. lanosa*, the upper incisors being, as in that species, nearly of the same length. The outer incisors in the lower jaw have the singular and prominent cusp, which I have mentioned as peculiar to the genus, quite as much developed as in any of the species.

Length of the head and body, about . . . . .	2	0
— of the head . . . . .	0	8
— of the ears . . . . .	0	5
Breadth of the ears . . . . .	0	5½
Length of the tragus . . . . .	0	4
Greatest breadth of the tragus, barely . . . . .	0	1
Length of the fore-arm . . . . .	1	6
— of the thumb and its claw . . . . .	0	4½
— of the first finger . . . . .	1	6
— of the second . . . . .	3	6
— of the third . . . . .	2	6
— of the fourth . . . . .	2	4
— of the tibia . . . . .	0	7½
— of the foot and claws . . . . .	0	4½
— of the <i>os calcis</i> . . . . .	0	10
Expanse of wings, about . . . . .	12	0

*Hab.* "Otjoro, December 1st, 1859. Female."

#### NYCTICEJUS PLANIROSTRIS, Peters.

*N. planirostris*, Peters, Reise n. Mossamb. Säugeth. i. 65. t. 17. f. 1, 1852.

Of this species there are a considerable number of specimens, differing from each other only in the depth of colouring of the fur—some of them being as dark in colour as the figure given by Dr. Peters, but the greater number much paler, the under parts being of a dirty-white colour. These light-coloured examples have much the appearance of *N. leucogaster*, but may be distinguished by their more robust form, larger head and ears, and by their much longer fur. I possess one specimen of this species from the Cape of Good Hope.

*Hab.* "Eleph. Valley, August 3rd, 1859," and "Otjoro, December 1st, 1859."

#### SCOTOPHILUS MINUTUS.

*Vespertilio minuta*, Temm. Mon. ii. p. 207.

Although M. Temminck refers to several specimens of this species, I have only observed one in the Leyden Museum; and that one is obviously immature. As there is considerable confusion amongst the species referred to this, I will give a description of an adult specimen which, by actual comparison, I have ascertained to be identical with the specimen in the Leyden Museum. The *S. minutus* appears to have a considerable geographical range; for I have seen and identified specimens from North Africa, as well as from the Cape; and examples are not wanting to illustrate its occurrence at intermediate

positions. I have two specimens which were collected by Mr. Andersson at Lake Ngama.

The top of the head is on the same plane with the face; the muzzle is moderately obtuse, a little more so than in the *S. kuhlii* of Europe; the nostrils are slightly tubular, ovoid, and opening sublaterally; between them is a shallow notch, which passes into a kind of narrow groove or canal, and is continued along the mesial line of the snout until it meets the fur of the forehead. The ears are considerably shorter than the head, triangular, rather longer than wide, a little rounded at the ends, and with scarcely a trace of external emargination or scooping out. There is no prolongation of the outer margin along the face anteriorly, to the root of the tragus. The tragus is about half the length of the ear; its greatest breadth is at one-third from the bottom, from which part it curves evenly to the tip, which is narrow and rounded; the inner edge is straight or a little concave, which gives the tragus somewhat of an inward tendency; in the outer margin, near to the base, is a notch, and below it a distinct but rounded lobe.

The thumb is small, its penultimate phalange the longest, its claw small and weak. The feet are rather small, the toes taking up more than half their length, the claws of medium size.

The wing-membranes extend to the root of the toes. The wings themselves are of medium size, and the membranes slightly translucent, but nowhere papillated.

The fur of the forehead extends to more than halfway between the root of the ear and the nostrils; sides of the face scattered with fine short hairs; over the eye a tuft of straight black hairs; and on the upper lip a straggling moustache of shorter and finer ones. The fur of the back extends on to the membrane beneath the humerus, and sparingly on to the interfemoral membrane; beneath, it encroaches on the membranes for a short distance all round the body.

On all the upper parts the fur is bicoloured, almost black at the roots for half its length, the remaining part of a dark brown colour, sometimes approaching an umber-brown, but more frequently dark greyish-brown. Beneath it is also bicoloured, brownish-black for two-thirds of its length, and tipped with whitish-brown; about the chin and sides of the neck it is tinged with chestnut, and on the pubes it is nearly cream-coloured. Cutaneous system dark brown, claws pale brown.

The cranium in its general outline very greatly resembles that of *S. kuhlii* and that of *S. pipistrellus*: but its similarity to the former of these is the most striking; to this species, indeed, it is rather closely allied, although perfectly distinct.

Dentition: M.  $\frac{2-2}{6}$ ; Can.  $\frac{1-1}{1-1}$ ; Premol.  $\frac{1-1}{2-2}$ ; Mol.  $\frac{3-3}{3-3} = \frac{14}{18}$ .

The upper incisors are very unequal in size; the outer ones very small, and pointed; the inner ones twice the length of the outer ones, slender, and pointed, with an ill-defined second point, which is situated outwardly. The canines are rather slender, and have a regularly disposed cingulum. The premolar tooth is rather longer than the

molars, and has the usual *carnassial* form. The true molars require no special mention.

The incisors in the lower jaw are small, symmetrically arranged, and trilobed; the canines have an anterior process above the level of the incisors, and a posterior one quite at the base; the first premolar is small and conical, about one-third the length of the canines; the second similar in shape, but almost twice the length of the first. The true molars may be passed by.

This species is one of a small group which is confined almost wholly to Africa,—the only species which is found elsewhere, as far as I know at present, being the *S. kuhlii*\* of Europe; and it is likely that this species is more abundant in the former than in the latter country. I shall be enabled, by reference to this known species as here described, to give a more satisfactory account of some others. I propose giving the dimensions together.

#### SCOTOPHILUS RUSTICUS, n. s.

The present diminutive species resembles in the shape of its head, ears, and incisor teeth the *S. kuhlii* and the *S. minutus*. Top of the head nearly on a level with the face, nostrils somewhat crescent-shaped, and the snout grooved as in *S. minutus*; ears small and triangular, as in *S. minutus*; tragus of uniform breadth, rounded at the end and curving inwards, the notch in its outer margin, at the base, small, and the lobe below it small and pointed. As in *S. minutus* the outer margin of the ear does not advance nearer the angle of the mouth than the base of the tragus.

Thumb and feet rather large in relation to the size of the animal, being equal in size to those of *S. minutus*. They are proportioned just as in that species.

The fur is confined to the body, both above and beneath. It is everywhere thick, soft, of moderate length, and without gloss. On the upper surface it is dark brown at the roots, with the terminal half light cinnamon-brown; on the under parts of the body, dusky at the roots, with the terminal half brownish white, excepting on the pubes, where it is almost of a uniform dirty white. The nose, ears, and wing-membranes are dark brown, the latter very narrowly edged with white, which is most distinct on each side of the feet.

The cranium resembles that of *S. kuhlii*, both in general conformation and in the number and arrangement of its teeth, being possessed of one more premolar than *S. minutus*.

Dentition: M.  $\frac{2-2}{6}$ ; Can.  $\frac{1-1}{1-1}$ ; Premol.  $\frac{2-2}{2-2}$ ; Mol.  $\frac{3-3}{3-3} = \frac{16}{18}$ .

The upper incisors are unequal in size, just as in *S. minutus*; the canines are relatively stouter than in that species, which is due in some measure to a slight fullness, or rounded prominence, in the middle of the thin hinder edge of the tooth; the first premolar is very small, being a mere tubercle, and is placed between the contiguous canine and premolar, and is visible only from within; the

\* Prof. Blasius states that this species and *S. marginatus* are identical; hence I make use of the above name as having priority.

second resembles in shape the first and only one in *S. minutus*, which it represents. The true molars do not need mention; and the lower jaw with its teeth is so much like that of *S. minutus*, that it may in like manner be dismissed.

**SCOTOPHILUS CAPENSIS.**

*Vespertilio capensis*, Smith, South Afr. Journ. new series, v. p. 1, 1832.

*V. minutus*, Smith, Ill. Zool. S. Afr. 1848.

I possess a specimen of a Bat which formerly formed part of the Museum of the Zoological Society, and was labelled "*Vesp. capensis*, Cape of Good Hope, collected by Mons. Verreaux," and is most likely the one given in the Catalogue prepared by Mr. Waterhouse, as the specimen was received the year before the publication of the catalogue. It is obviously the same species as the one figured by Sir Andrew Smith under the name of *V. minutus*, which species it resembles so exactly in all respects save that of size, that I shall content myself with giving the dimensions with those of the two last species. The greater size of this one will be quite sufficient to distinguish it.

In the following table of dimensions, the column which gives those of *S. capensis* has been taken from the specimen from the Zoological Society. The first one of *S. minutus* is from a North African specimen in my own collection, which has been compared with the specimen in the Leyden Museum, and the second one from the latter specimen itself. The fourth column (*S. kuhlii*) from a specimen collected in Algeria by the Rev. H. B. Tristram; and the remaining two columns are devoted to the two specimens of the new species, which I have called *S. rusticus*.

	<i>S. capensis.</i>		<i>S. minutus.</i>		<i>S. kuhlii.</i>	<i>S. rusticus.</i>	
	in. lin.	in. lin.	1.	2.		1.	2.
Length of the head and body	2 2	1 10	1 9	1 10	1 6	1 7	
— of the head.....	0 8	0 7	0 7	0 7	0 6½	0 6½	
— of the ears .....	0 5	0 3½	0 3	0 3½	0 3½	0 3¾	
— of the tragus .....	0 2¾	0 2	0 2	0 2¼	0 2	0 1¾	
— of the fore-arm .....	1 6	1 2½	1 2½	1 3	1 2	1 2	
— of the thumb .....	0 3½	0 2½	0 3	0 3	0 3	0 2¾	
— of the first finger ...	.....	1 0	.....	.....	1 1	1 1	
— of the second finger ..	2 8½	2 3	2 1	2 3	2 0	2 0	
— of the third finger ...	2 3	2 0	.....	1 10	1 9	1 8	
— of the fourth finger...	2 0	1 9	1 7	1 7	1 5	1 5	
— of the tibia .....	0 7	0 5½	0 5¾	0 5½	0 4½	0 5	
— of the foot and claws	0 4	0 3	0 3¼	0 3	0 3	0 2¾	
— of the tail .....	.....	1 5	1 3	1 4	1 2	.....	
— of the <i>os calcis</i> .....	0 6	0 6	.....	0 5½	0 5	0 5	
Expanse of wings .....	11 0	9 3	8 6	9 4	7 8	8 0	
Total length of skull .....	.....	.....	.....	0 6	.....	0 5½	

**SCOTOPHILUS VARIEGATUS, n. s.**

This handsome species is about the size of the *S. leisleri* of Europe.

The head is very short ; the muzzle short and obtuse, but not very broad or depressed, being about as deep as it is wide. The forehead is elevated in only a trifling degree above the facial line ; the nostrils are somewhat prominent, rather small, and open sublaterally, almost laterally ; they are nearly round, with a narrow posterior elongation or slit not exceeding in length the diameter of the nostril ; the lips are simple, thick, and rather overhanging. The ears are small, of an irregular roundish ovoid form, their inner margin having a kind of lobe, the lower outline of which projects downwards over the forehead, and is there distinct ; but blends off in an upward and outward direction to the tip of the ear, which is rounded, and has a somewhat outward direction ; the outer margin approaches in some degree to a straight line, and a very narrow piece of membrane passes forward along the side of the head to near the corner of the mouth, where it terminates in a small fleshy lobulus of a rounded form. The ear-conch is rather thin, but not papillated, and has a few distinct sulci near its outer margin, and a longitudinal seam near the inner one. The tragus is broad and short, and shaped somewhat like that of the *S. borealis* of Europe. Outwardly at its base is a descending point, and above this a broad notch, which varies in depth, but is usually rather shallow ; and above this it is of nearly equal breadth, the outer margin being rounded, and forming with the inner margin, which is nearly straight, a blunt angular tip, which is directed inwards.

The penultimate phalange of the thumb is a little longer than the basal one, the claw short and not very hooked. Toes rather longer than the remaining part of the foot ; the claws small and black. Wing-membranes extending barely to the roots of the toes. Calcaneum long, with a considerable cartilaginous lobe near the middle of its lower edge.

The fur of the forehead extends almost to the end of the nose, in some specimens quite as far forward as the nostrils ; the sides of the face sprinkled rather thickly with fine, short, whitish hairs ; over the eye and between it and the nostrils are some longish black ones, which are straight and stiff. Inside the ears are a few fine adpressed hairs ; and their outer surface is thickly clothed with fine fur for half-way from their base. The fur of the back extends on to the membranes on all parts, but to a greater extent on the interfemoral membrane than anywhere else. Beneath, it spreads on to the membranes, chiefly on and under the humerus, occupying the space (but not thickly) between the elbow and the knee. On their upper surfaces the toes are clothed with fine adpressed hairs ; but the other parts of the foot are perfectly naked.

On all parts of the body the fur is long, soft, and unicoloured, or very nearly so ; that of the upper parts cream-coloured, palest on the head and neck, and becoming considerably darker on the hinder part of the back and on the interfemoral membrane ; beneath, it is of a dirty-white colour. All that of the body, but not of the membranes, has a slight ashy tinge at its roots.

The membranes are so peculiarly marked as to deserve especial

notice. They are rather ample, thin, and remarkably marked with veins, but are not papillated. The ground-colour is pale yellowish-brown, everywhere strongly marked with veins of a deep brown colour, which are faintest near the body and on the interbrachial membrane: on the interfemoral membrane they are very distinct, not very numerous, and have a transverse disposition; beneath the humerus they have a tessellated arrangement; but beneath the forearm they are more branched; whilst between the fingers and at the ends of the wings they are run together, and a dark-brown mottled appearance is produced. The ears and muzzle pale brown; legs, tail, and wing-bones darkish brown.

The skull is remarkable for its shortness and great depth in relation to its breadth, and for the almost total absence of ridges or crests. Although the facial line of the cranium makes a near approximation to a straight line, yet the occipital region is so high as to form a facial angle of 48 degrees\*. This is due in some degree to the shape of the maxillary bones, the lower or alveolar margins of which curve upwards from the root of the zygoma to the intermaxillary bones. Some approach is made to this form of cranium by that of some of the species of *Lasiurus*, as the *L. noveboracensis*; but in that species the facial angle does not exceed 35 degrees\*.

The upper incisors are four in number, very unequal in size, the outer ones being almost rudimentary. The inner ones are of moderate size, acute, and with a moderate cingulum, the outer ones very short and conical, with an evenly developed and broad cingulum. Canines rather slender and pointed. First and only premolar well developed and of the usual *canassial* form; the three true molars of ordinary form, excepting the hinder one, which is very narrow from front to back, but has the usual number of cusps.

The lower jaw has a less prominent posterior angle than in other species of the genus, but does not otherwise differ materially. The incisors have the usual external trilobed appearance; but they are thicker from front to back than is usual, and the hinder part is produced into a kind of basal lobe, which has sufficient prominence to have the appearance of a fourth cusp. The canines are rather acute, and have the cingulum produced anteriorly into an acute point, a little above the level of the incisors. The first premolar is small, conical, and with a regular cingulum; the second somewhat similar, but considerably longer, and it is succeeded by the three true molars, of usual size and proportions, excepting the posterior one, which is rather smaller than usual.

Dentition: M.  $\frac{2-2}{6}$ ; Can.  $\frac{1-1}{1-1}$ ; Premol.  $\frac{1-1}{2-2}$ ; Mol.  $\frac{3-3}{3-3} = \frac{14}{18}$ .

Length of the head and body . . . . .	2	4	2	3
——— of the head . . . . .	0	8	0	9
——— of the ears . . . . .	0	4	0	4
Breadth of the ears . . . . .	0	4	0	4
Length of the tragus . . . . .	0	$2\frac{1}{3}$	0	$2\frac{1}{2}$

\* Taking the lower margin of the maxillary bone as the horizontal or base-line.

Breadth of the tragus . . . . .	0	1	0	1
Length of the fore-arm . . . . .	1	9	1	8
— of the thumb . . . . .	0	4	0	3 $\frac{3}{4}$
— of the first finger . . . . .	1	10	1	9
— of the second finger . . . . .	3	5	3	2
— of the third finger . . . . .	2	7	2	4
— of the fourth finger . . . . .	2	2	2	0
— of the tibia . . . . .	0	9	0	8 $\frac{1}{2}$
— of the foot and claws . . . . .	0	4 $\frac{2}{3}$	0	4 $\frac{1}{2}$
— of the tail . . . . .	2	0	1	10
— of the <i>os calcis</i> . . . . .	0	9	0	9
Expanse of wings, about . . . . .	13	6	12	9
Length of skull from front of intermaxillary bone to the occipital suture . . . . .	0	6	0	6
Breadth behind the zygomatic arches . . . . .	0	4	0	4
Length from the condyloid fossa to the front of the intermaxillary bone . . . . .	0	4 $\frac{1}{4}$	0	4 $\frac{1}{4}$
Length of the dental series of the upper jaw, exclusive of the incisors . . . . .	0	2 $\frac{1}{2}$	0	2 $\frac{1}{3}$
Length of the bony palate . . . . .	0	2	0	2 $\frac{1}{4}$
Breadth between the points of the upper canines . . . . .	0	2	0	2
Breadth between the two posterior molars . . . . .	0	2	0	2
Depth from the occipital suture to the bottom of the auditory bullæ . . . . .	0	4 $\frac{1}{2}$	0	4
Greatest length of lower jaw . . . . .	0	5 $\frac{1}{4}$	0	5
Breadth of lower jaw vertically from the coronoid process . . . . .	0	1 $\frac{3}{4}$	0	1 $\frac{2}{3}$
Length of the dental series, exclusive of the incisors . . . . .	0	2 $\frac{3}{4}$	0	2 $\frac{1}{2}$

*Hab.* "Otjoro, December 1st, 1859."

*Obs.* I have chosen to give an ample description of this species because it differs in some respects from any other species of the genus which I have seen, the differences appearing to me to be such as may (if found in any other species) be sufficient to point out another minor group, parallel with those which have been partially indicated by Blasius, and more fully by Kolenati. Broadly, these differences may be stated thus:—*Cranial portion of the skull much raised, instead of being depressed; muzzle not depressed; cutaneous system thin and elaborately veined, instead of being thick and leathery; fur long, soft, and unicoloured, and covering nearly the whole of the face.*

#### MINIOPTERIS SCHREIBERSII.

*Vespertilio schreibersii*, Kuhl, Deutsch. Fleder. 41.

*V. dasythrix*, Temm. Mon. ii. 268.

*Miniopterus dasythrix*, Smith, Zool. S. Afr. pl. 52.

Two examples of this European species were examined by me in

40 MR. A. D. BARTLETT ON THE BLACK-FOOTED RABBIT. [Jan. 22, 1855, which had recently been received from Mr. Andersson, and collected at Lake Ngama.

*MOLOSSUS LIMBATUS*, Peters.

*Dysopsis limbatus*, Peters, Reise n. Mossam. Säugeth. 56. t. 14.

With the above-mentioned specimens of *Miniopterus* were two of a species of *Molossus*, differing only from the figure and description given by Prof. Peters of his *D. limbatus* in the colour of the fur, which was without a trace of the large white abdominal mark so conspicuous in his figure. However, as the dimensions appear to accord pretty accurately, as well as the size and conformation of the cranium and the number and proportion of its teeth, I do not attach much importance to the variation in the colour of the fur, the difference in which may perhaps be attributed to age, sex, or even to season.

## 2. ADDITIONAL NOTE ON THE BLACK-FOOTED RABBIT. BY A. D. BARTLETT.

(Plate IV.)

On the 23rd of June 1857, at the evening meeting of this Society, I called the attention of the meeting to some Rabbits, known as the Himalayan Rabbits, and proposed provisionally to call the species *Lepus nigripes*\*

Soon after my paper was published, I received a letter from a gentleman at St. Ives, informing me that this kind of rabbit could be produced by crossing the dark *wild silver-grey* rabbit with a breed known as the *Chinchilla* or light silver-grey. This at the time appeared to me strange and unlikely; nevertheless I determined to make the trial; and having during the last two or three years produced by these means a large number and fully established the fact, I beg leave to bring them before your notice.

I have here a light *silver-grey male*, a dark *silver-grey female*, and *two young* of a litter of *five*,—*two* of the number being of the Himalayan variety, the other *three* silver-greys; I have many other examples of the same thing.

Now, if the white or Himalayan varieties are removed and kept together, the result will be all Himalayan, thus showing a tendency to increase this variety at the expense of the silver-greys, because, although you may remove and destroy all the white specimens, still the silver-greys from which they originated will continue to produce white young ones, while, on the other hand, the white variety never produces silver-greys.

I mentioned in my former paper that large numbers of the skins of the white variety were imported to Europe annually, and these are probably bred in Asia. I now beg leave also to mention that for many years a large trade has been carried on by two or three mer-

\* P. Z. S. 1857, p. 159.



J. Wolf del et lith.

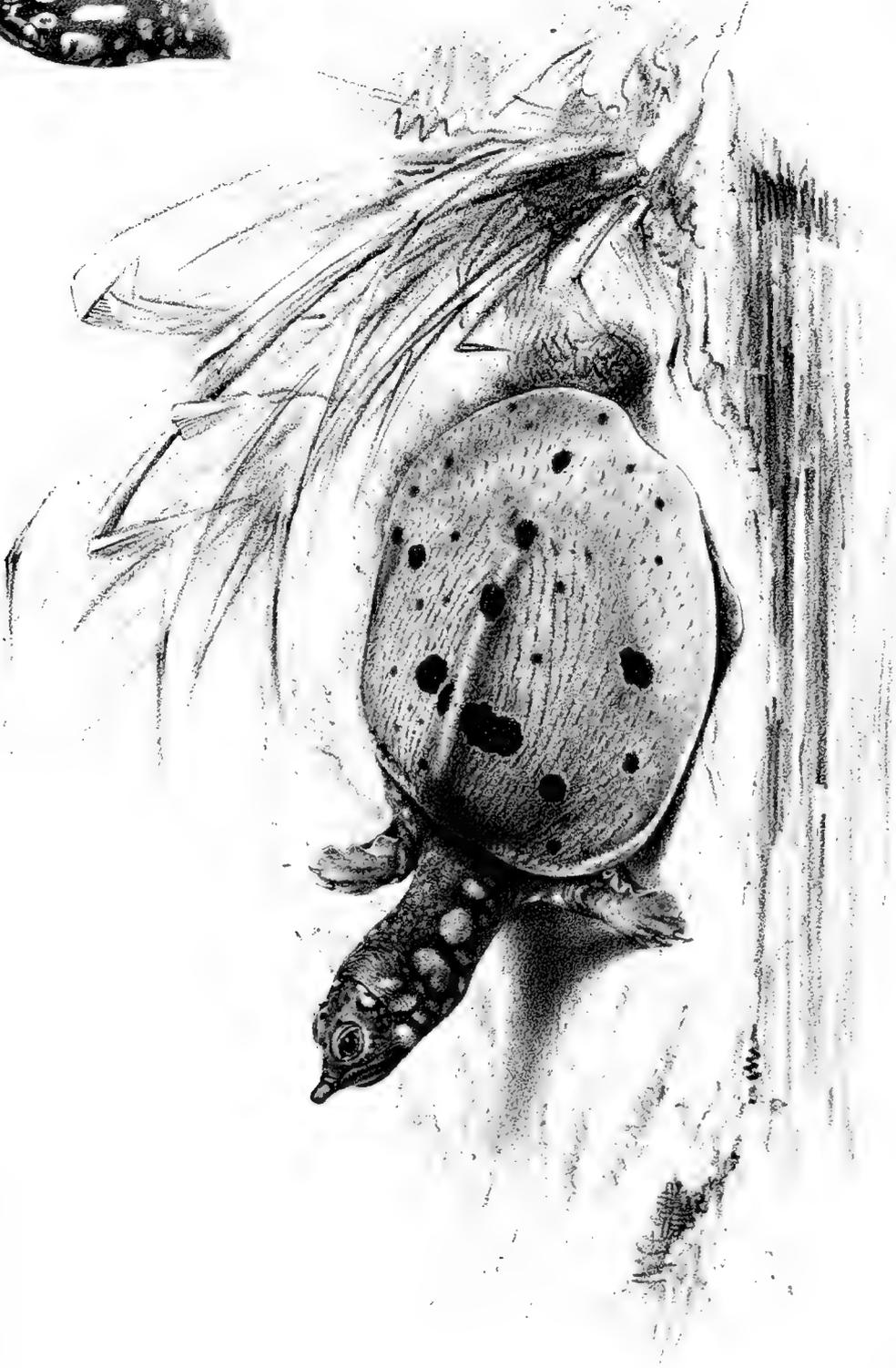
L. 705 CUNICULUS 707

M & N. Hanhart Imp

11-11-2021

1000





chants, who buy all the skins of the silver-grey rabbits, and export them to *Russia* and *China*; these skins realize a very high price, some of them 36s. per dozen, in this country.

With reference to the origin of the light-coloured silver-grey or Chinchilla rabbit, I am only able to say they came from the Continent to this country, being met with in the South of France and Belgium, but, as far as I am aware, always in a state of domestication. Observing that we receive large quantities of the skins of these white rabbits, and that the skins of the silver-grey rabbits are sold to the Russians and Chinese at a large price, I am led to think (from the experiments that I have tried) it highly probable that at some period the silver-grey rabbit existed in *Russia* or *Asia* (and hence the taste or fashion for their skins), and that this breed has been lost and replaced by the white variety whose skins we now receive in such abundance—finding, as I have before remarked, that these have a strong tendency to out-number the *greys*.

In conclusion, it is deserving of remark that, in all instances, the young of the silver-greys are quite black for the first five or six weeks, at about this age the grey hairs beginning to make their appearance on the breast and sides; while the young of the Himalayan or black-footed kind are always perfectly white until they are five or six weeks old, at which time the black hairs begin to appear on their noses, feet, ears, and tails.

### 3. DESCRIPTION OF A SOFT TORTOISE FROM CAMBOJA.

BY DR. J. E. GRAY, F.R.S., V.P.Z.S.

(Plate V.)

I have only been able to observe this *Trionyx* in its young state; but I make no apology for describing it as a distinct kind, as I find from experience that the colouring of the young animal of this family of Tortoises affords one of the best characters for the distinction of the species; and I believe it is from their not having been studied in that state that the species have been hitherto confounded together. The character thus afforded has the advantage of not being liable to variation from development, as is the case with the comparative length of the free part of the ribs and with the form of the sternal callosities, which have been hitherto chiefly depended on for specific characters.

#### TRIONYX ORNATUS. (Pl. V.)

Back of the young animal, in spirits, brown, with large, unequal-sized, irregularly disposed black circular spots. Head olive, with symmetrical small black spots on the chin, forehead, and nose. Throat and sides of neck with large, unequal-sized, irregular-shaped and nearly symmetrically disposed yellow spots. Legs olive, yellow-spotted in front. Sternum and under side of margin yellow. Sternal callosities not developed.

*Hab.* Camboja (*M. Mouhot*).

This species is most like the young of *T. gangeticus*; but the dorsal spots are solid, not annular; and the head is olive, dotted with black.

It has some affinity to *Trionyx tuberculatus* of Dr. Cantor from Chusan, which appears, from a drawing by Dr. Cantor in the Indian Museum at Fifehouse, to be distinct from any of the other Asiatic species that have occurred to me. That species has eight large and four small white-edged black spots, placed in pairs, on the dorsal disk, the throat with a dark streak on the middle of each side, the chin yellow, black-dotted. The lateral sternal callosities are large, oblong, and the posterior one round.

4. DESCRIPTIONS OF TWO SPECIES OF CRUSTACEA BELONGING TO THE FAMILIES CALLIANASSIDÆ AND SQUILLIDÆ. BY ADAM WHITE, ASSISTANT ZOOL. DEP. BRIT. MUSEUM.

(Plates VI. and VII.)

The *Callianassa* here described is from the Camaroons River, W. Africa, whence it was brought by the captain of an African trader to J. Aspinall Turner, Esq., M.P., the well-known possessor of a very fine collection of African insects. Mr. Turner liberally presented it to the Museum, with the information, that this long-bodied Crustacean appears periodically in the river in prodigious numbers, which disappear in the course of ten days or a fortnight. The natives are very fond of them, as they are delicious eating; and as soon as they make their appearance in the river, the men leave their usual pursuits to catch them.

Genus CALLIANASSA, Leach.

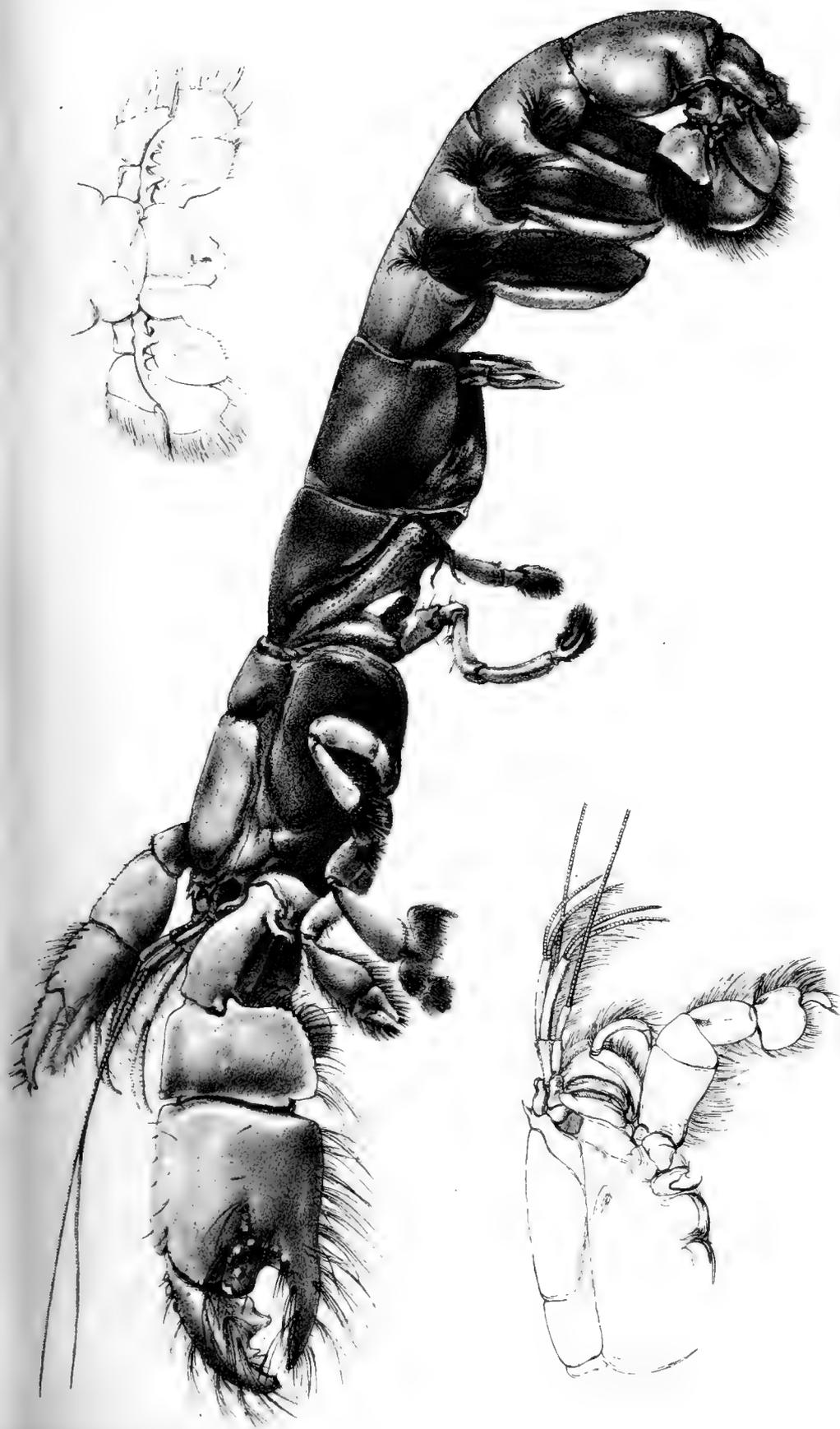
CALLIANASSA TURNERANA, n. s. (Pl. VI.)

*C. processu rostrali breviter trispinoso; digito superiore obtuso, intus quadridentato; abdominis segmentis tertio quarto quintoque plagis duabus pellucidis, pilis densis brunneis postice obsitis.*

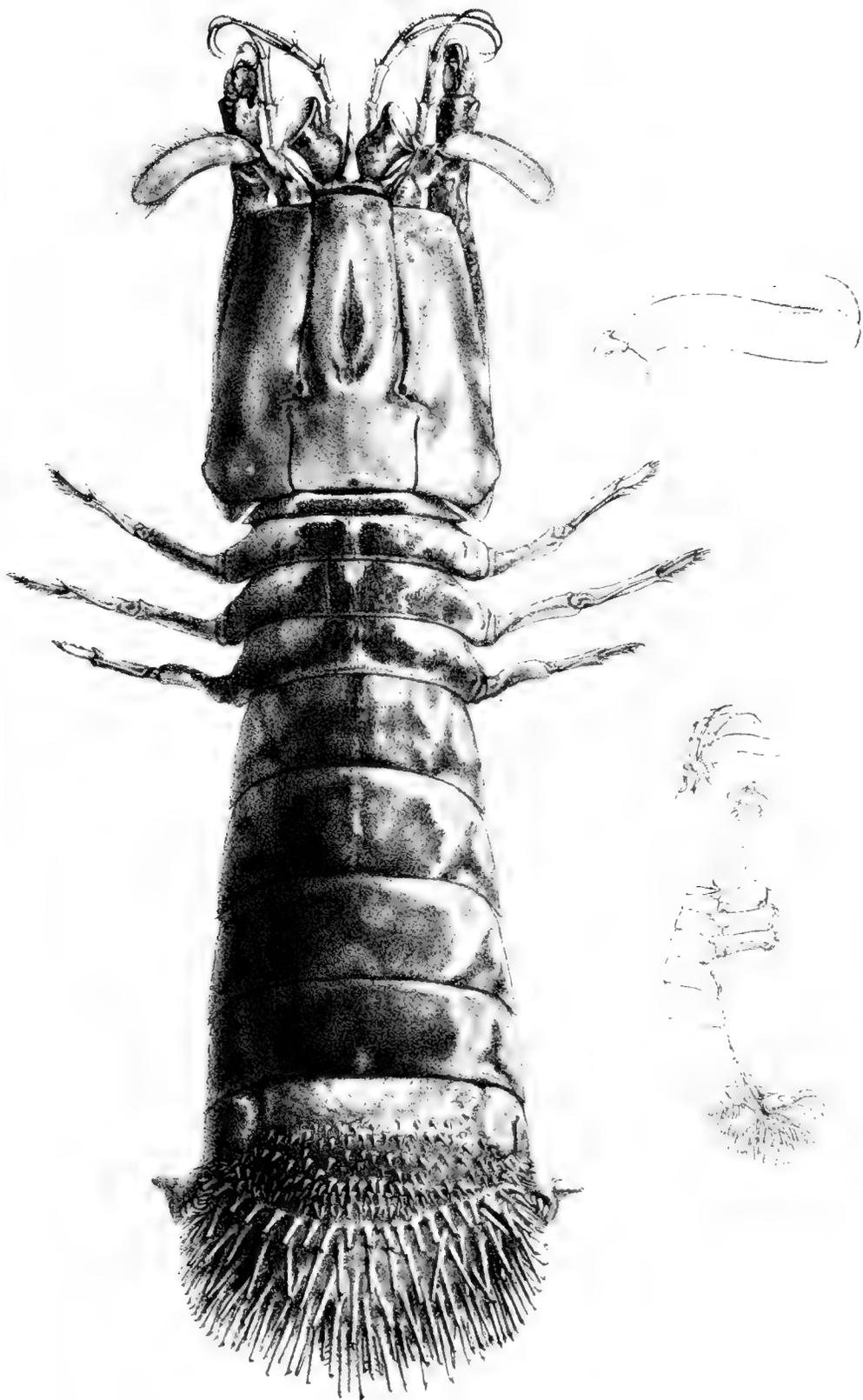
Long. unc.  $6\frac{3}{4}$ .

*Hab.* Africa occ. (Camaroons).

Moveable finger of the large claw blunt at the end, the back gradually curved, the base with three or four small tubercles arranged longitudinally, and with indications of another row; the inner edge has four teeth, the two largest near the base, united so as to form one large lobe with another tubercle inside. There is a considerable space left between the moveable finger and the fixed one; the edge of the latter is toothless, but is hollowed on the inside and at the base, where it is covered with closely placed rounded tubercles; the immoveable finger is not much arched, and is pointed. The outside and greater part of the inside of the claw are very smooth, the lower edge being fringed with long and rather coarse hairs, which are arranged in tufts, as they are also, in a double row, on the upper edge of the moveable finger. There are, besides, four rows of distant tufts







C.H.Ford.

W.West inr.

*Gonodactylus guerinii.*



of hair on the outside of the greater claw. Wrist sharp-edged above and below, and crenulated on the lower margin. Rostral process with three short sharpish teeth. Third, fourth, and fifth abdominal segments with a large tuft of hairs covering the greater part of a pellucid space on each side, in the third and fourth behind the middle of the segment, in the fifth about the middle.

Central caudal plate rather broader than long, at the end three-lobed, the central lobe the longest and the largest: this central plate has two longitudinal furrows, which divide it into three parts, the central part bulging at the base, from the large rounded tubercle which nearly covers it. Outer plate as if formed of two anchylosed plates, with a rounded outer margin, which is closely and densely covered with brown hairs. On the upper side these hairs extend over nearly the apical half of one (the outer) of the two portions of which the outer plate seems to be formed.

In the Illustrated Proceedings of the Society for 1850 there is the description and figure of a fine species of *Gonodactylus*, belonging to the second section of the genus as defined by Milne-Edwards, that in which the rostral plate is rounded and not pointed in front. The species is from China, and, from the peculiar armature of the caudal ring, received the name of *G. cultrifer*. The species now described is remarkable for the singularly armed caudal ring, which, with the sixth abdominal segment, is covered with outstanding spines. This species, which I have named *Gonodactylus guerinii*, belongs to the first section of the genus, that in which the rostral plate is armed on the median line with a long spiniform tooth. It was obtained on the voyage of H.M.S. 'Herald.'

#### Genus GONODACTYLUS, Latr.

##### GONODACTYLUS GUERINII, n. s. (Pl. VII.)

*G. carapace subquadrato, processu rostrali spinis tribus longis armato; abdominis segmento quinto ad apicem breviter spinosulo, segmentis quinto et caudali spinis plurimis longis erectis armatis.*

Long. unc.  $2\frac{1}{4}$ .

*Hab.* Matuka, Fiji Ins.

Carapace as wide behind as long, in front almost a third narrower than behind, the central plate extending beyond the lateral plates over the base of the rostral process; the anterior lateral angle of outer plate subquadrated, the posterior lateral corner subrotundate; lateral edges of carapace subcoriaceous. Rostral plate with its body wide but not deep, with three strong and sharp spines in front; the central spine longest, not so long as ophthalmic pedicel; the other two come out obliquely, one on each side of the body of the rostral plate.

First four abdominal rings smooth above; fifth abdominal ring smooth at the base, at the tip with four or five transverse rows of short spines longest at the tip; sixth segment with many (about

fifty) crustaceous spines, bluntish, and with a short coriaceous bristle at the end; caudal ring on its dorsal surface with twenty-two long outstanding crustaceous spines tipped like the others, each of the lateral margins with two rows, like combs, of crustaceous spines, which meet behind and terminate at the end of the lateral spines—two of the four which arm the hinder margin of the caudal ring. This hinder margin has three notches, the middle one deepest, their projecting sides ending in the spines, the sides of which are pectinated with smaller spines. Segment of raptorial leg before the claw rather slender, not bulged at the end beneath. The claw minutely serrulate on the inside near the tip. From the indications of marbling in the dried specimen, this curious *Gonodactylus* is most probably finely and variedly coloured when alive.

---

February 12th, 1861.

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

Dr. P. L. Sclater exhibited a specimen of a Caprimulgin bird closely allied to, if not identical with, *Cosmetornis vexillaria* (Gould), from the collection of Edmund Gabriel, Esq., H.B.M.'s Commissioner at Loanda in Angola. This bird had been presented to Mr. Gabriel by the captain of a vessel, who stated that it had flown on board his ship off the west coast of Africa. Of the only two previously examined specimens of this species, one (Mr. Gould's type, now in the British Museum) was said to have come from Socotra; and the other, in Sir William Jardine's collection, had likewise been taken on board a vessel in the Mozambique Channel.

Dr. Sclater also exhibited, on behalf of Capt. Abbott, the hoof of a bull (*Bos taurus*, var. *domesticus*) from the Falkland Islands, in which the hoof was abnormally lengthened, one of the toes turning upwards and curving round backwards. Captain Abbott, the owner of the specimen, stated that such malformations were not uncommon among the wild cattle in the Falklands, and were considered attributable to their always living on the soft boggy ground there everywhere prevalent.

Mr. Bartlett exhibited living examples from the Society's Menagerie of two singular hybrid Ducks—one pair being the produce of the Summer Duck (*Aix sponsa*) and Pochard (*Fuligula ferina*), and the other of the Summer Duck and Castaneous Duck (*F. nyroca*).

The following papers were read:—

1. ADDITIONS AND CORRECTIONS TO THE LIST OF THE BIRDS OF THE FALKLAND ISLANDS. BY PHILIP LUTLEY SCLATER, M.A., Ph.D., SECRETARY TO THE SOCIETY.

Some specimens of birds brought home from the Falklands by Captain Abbott (whose name is so well known in connexion with the natural history of these islands) on his recent return to this country, and some information kindly communicated to me personally by the same gentleman, have enabled me to make several additions to, and corrections of, my "Catalogue of the Birds of the Falkland Islands," as communicated to the Society in November last\*.

1. BUTEO ERYTHRONOTUS (P. Z. S. 1860, p. 384).

Capt. Abbott's marked specimens of this bird and *B. varius*, together with his observations on them in a state of nature, seem to prove that there are two of these singular species of Buzzards in the Falklands, in both of which the sexes are dissimilar. Capt. Abbott fully confirms D'Orbigny's views of the red-backed bird (*B. erythronotus* of King) being the female of the grey-backed, just as they are figured in the plates to the Birds of D'Orbigny's 'Voyage' (pl. 3. figs. 1 & 2) under the name *Buteo tricolor*. Meyen has also given a very recognizable figure of the male bird, when not quite adult, under the name *Aquila braccata* (Act. Acad. L.-C. Nat. Cur. xvi. Suppl. tab. 8, p. 65). The immature bird of this species is barred transversely below, each feather being crossed by two or three narrow deep-brown bands. In *Buteo varius*, according to Capt. Abbott's observations, the adult male is uniform blackish grey above and below, in which stage it is probably the *Falco poliosoma* of Quoy and Gaimard, and *Buteo unicolor* of D'Orbigny. The adult female has the red back of the female of the former species, and much resembles it in its upper surface; but below, instead of being pure white, it is deep blackish grey or lead-colour, with the whole of the belly deep chestnut-red like the back. Capt. Abbott has recently brought home two marked females so coloured, now in Mr. Gurney's collection, and had previously sent to England a male example of this bird, which he found breeding, and of which he obtained the eggs, as described by Mr. Gould (P. Z. S. 1859, p. 94). The young of this bird, instead of being transversely barred as in the former species, is marked below with elongated sagittate spots, in which stage it is the true *B. varius* of Gould, and is well figured in Cassin's work before alluded to (pl. 3. fig. 1), under the name given to it by Mr. Gould.

Should Capt. Abbott's views as to the distinctness of these two species and the variations of their respective plumages be correct, which I have every reason to believe is the case, the following will be the correct synonymy of the latter bird, which I have called *B. varius*.

BUTEO POLIOSOMA.

*Falco poliosoma*, Quoy & Gaim. Voy. Uranie, p. 92, pl. 14 (♂ adult.).

\* See P. Z. S. 1860, p. 382.

*Buteo unicolor*, D'Orb. Voy. Ois. p. 109 (♂ adult.).

*Buteo varius*, Gould, P. Z. S. 1837, p. 10; Cassin, U. S. Expl. Exp. Atlas, pl. 3. fig. 1, juv.

2. *CHRYSOMITRIS MAGELLANICA* (Gm.).

Capt. Abbott has presented me with a skin of this species, shot out of a flock of five or six in September 1860—the only occasion on which he has met with this bird. The species is said to be very common on Keppel Island, sixty miles N.W. of East Falkland.

3. *ATTAGIS MOLOUINA* (Bodd).—*Tetrao falklandicus*, Gm.

Captain Abbott has obtained one example of an *Attagis* in East Falkland, probably referable to this species.

4. *HOPLOPTERUS CAYANUS* (Lath:).

Two examples of this Plover have been observed in East Falkland, and one of them was shot and sent to England.

5. *PLATALEA AJAJA*, Linn.

Two examples of this Spoonbill have been obtained in the Falkland Islands; but it can be regarded only as a rare straggler.

6. *FULICA* — ?

A species of Coot has been once obtained by Capt. Abbott in East Falkland, and the specimen was sent to England.

7. *CHLOËPHAGA POLIOCEPHALA*, G. R. Gray.

This near ally of the "Brent-Goose" of the settlers in the Falkland Islands—the species which I have termed *C. rubidiceps* (P. Z. S. 1860, p. 387, pl. 173)—occurs occasionally in the Falkland Islands as a straggler from the coast. Capt. Abbott has brought home several specimens.

8. *MICROPTERUS PATACHONICUS*, King, P. Z. S. 1830, p. 15.

Capt. Abbott maintains stoutly the specific difference of this bird (which is called the "Flying Loggerhead" in the Falklands) from the common *M. cinereus*. I have not yet been able to meet with specimens of the two species for exact comparison; but *M. cinereus* is said to be quite unable to fly, while *M. patachonicus* can do so well and strongly.

9. *EUDYPTES DIADEMATUS*, Gould, P. Z. S. 1860, p. 419.

Capt. Abbott obtained one single specimen only of this bird, from which Mr. Gould's description was taken. It was found in a "rookery of Rock-hoppers" (*Eudyptes nigrivestis*).

10. *EUDPTYES NIGRIVESTIS*, Gould, P. Z. S. 1860, p. 418.—*Aptenodytes chrysocome*, Abbott, Ibis, 1860, p. 337.

According to Mr. Gould's views, the common "Rock-hopper Pen-

guin" of the Falkland Islands is of this species, and quite distinct from the true *E. chrysocome* of Forster, which is an inhabitant more particularly of the Australian seas. As, however, Capt. Abbott has obtained a single specimen of the true *Eudyptes chrysocome* in the Falklands, the latter bird must also be retained in the list as a straggler.

11. *EUDYPTES ANTARCTICUS* (Forster): Voy. Erebus & Terror, Birds, pl. 26.

Capt. Abbott obtained a single specimen of this Penguin in Berkeley Sound, East Falkland. It was by itself in the bay when procured. This example is now in Mr. Gould's collection.

The Penguins which occur in the Falkland Islands appear therefore to be no less than eight in number, viz.—

1. *Aptenodytes pennantii*. Called the "King Penguin."
2. *Spheniscus magellanicus*. "Jackass Penguin."
3. *Eudyptes chrysolophus*. "Macaroni Penguin."
4. ——— *diadematus* (accidental visitor).
5. ——— *chrysocome* (accidental visitor).
6. ——— *nigrivestis*. "Rock-hopper Penguin."
7. ——— *antarcticus* (accidental visitor).
8. *Pygosceles wagleri*. "Gentoo Penguin."

Of the preceding eleven species, on which I have remarked as above, ten are not included in my former list. This addition would raise the number of the species belonging to the Avifauna of these islands to sixty-seven. On the other hand, I may remark, Capt. Abbott doubts much the occurrence of *Cinclodes vulgaris* and *Scytalopus magellanicus* in the Falkland Islands, and is also unacquainted with *Phrygilus xanthogrammus*, which is perhaps not really distinct from *P. melanoderus*.

2. ON THE ASIATIC SNAKE CALLED TAPHROMETOPON LINEOLATUM BY PROFESSOR BRANDT. BY DR. W. PETERS, OF BERLIN, FOR. MEM. Z.S.

The late Professor Eversmann of Kasan discovered in the year 1822, on his journey from Orenburg to Buchara, a species of Snake, which was described by Lichtenstein\* as "*Coluber trabalis*, Pallas." The specimens are, as I find from the manuscript notes which Eversmann sent with his collection, from Buchara and the desert of "Burzuk" (Barusek), on the eastern shores of lake Aral, and bear in our museum the label "Nordasien, Eversmann." There were originally five examples of this snake in our collection; and three are still there. One of them was sent in December 1823 to Temminck. Now, as the description of *Chorisodon sibiricum* (in the 'Erpétologie Générale,' viii. p. 901) may perfectly well be applied to the *Coluber trabalis*,

\* Ed. Eversmann, 'Reise von Orenburg nach Buchara,' Berlin, 1823, p. 146.

Lichtenstein (not Pallas), in the Berlin Museum, and as Bibron expressly remarks that his "*Monodiastema*" is founded on a specimen in the Leyden Museum labelled "*Coluber trabalis*\*, " the latter is doubtless the same which Temminck received from Lichtenstein in 1823. I think this explanation necessary to prove that the habitat of the Leyden specimen is not Siberia properly so called, but the more southern part of Central Asia.

This snake is (what I should not have found out from Bibron's description), in the form and concavity of the head, and in the lanceolate longitudinally-grooved scales, very much like *Cœlopeltis lacertina*. There is scarcely any difference in the plates of the head, excepting in the loreal, which is single and very long. But the general form of the body and tail is very different, much longer and more slender than in *Cœlopeltis*. In a specimen of 1.065 m. in length the head is in all dimensions only half as large as in a *Cœlopeltis lacertina* of 0.930 m. in length. All this agrees exactly with the description Brandt (Bulletin Scientifique de l'Académie des Sciences de St. Pétersbourg, iii. p. 243) has given, in 1837, of a new species of snake, brought home by M. Karéline from the eastern shores of the Caspian Sea. His description, although rather short, is very accurate; but he has omitted to pay attention to the form of the teeth.

"TAPHROMETOPON, n. g. *Scutum verticale valde elongatum, postice angustissimum. Corpus necnon cauda valde elongata et tenuia. Frons et vertex depressa. Frontis et verticis ratione ad genus Cœlopeltis accedit, sed præter corporis staturam, capite, præsertim rostro longiore, tetragono et scuto loreo elongato, simplice, necnon superciliis minus acute prominentibus differt.*"

"COLUBER (TAPHROMETOPON) LINEOLATUS. *Caput sat angustum, oblongo-tetragonum. Collum penna anserina paulo crassius. Squamæ medium dorsum obtegentes omnes satis anguste lanceolatae. Abdomen subplanum, album. Collum et abdominis anterior pars punctis lateralibus minoribus et centralibus paulo majoribus olivaceo-nigricantibus adspersa. Frons et verticis, necnon occipitis medium e griseo olivascentia. Dorsum cinereum, exceptis lineis quatuor e nigricante olivaceis, quarum duæ in superciliis incipientes parallele, sed parum distincte in medio dorso pallidiores ad caudam usque decurrunt, et duæ aliæ pone nares initium capientes ab oculis interruptæ in lateribus corporis subvanidæ et magis griseæ conspiciuntur. Corporis longitudo 1' 11", caudæ 5½, abdominis latitudo summa 4"*"

Brandt does not mention the grooved appearance of the scales;

\* Duméril (*l. c.* p. 902) cites *Coluber trabalis*, "Schlegel." But this seems to be a mistake; for Schlegel's *Coluber trabalis* is, as Dr. Günther (Catalogue of Snakes, p. 93) justly remarks, synonymous with *Coluber (Elaphis) diene*, Pallas, and the true *Coluber trabalis* of Pallas only a variety of *Zamenis atrovirens*, Shaw, sp.

but his specimen seems to have been very young, according to the dimensions he has given.

A few years later, in 1841, apparently the same snake was described and figured by Eichwald (Fauna Caspio-caucasica, p. 123, t. 29) under the name of *Cœlopeltis vermiculata*, from the western shores of the Caspian Sea. At least, the number of the longitudinal rows of scales, seventeen, agrees with *Chorisodon*, and not with *Cœlopeltis lacertina*, which has nineteen rows of scales. Yet I have some doubts of their identity, the general form of Eichwald's species being more like that of the latter.

The examination of the teeth of the three Berlin specimens shows no free space between the maxillary teeth, as described by Bibron; but they form a continued row, excepting the hinder furrowed ones, which are separated, as usual, by a small interval from the rest. There are (fig. 5) first seven very small teeth, only loosely attached to the maxillary bone, then three very long and strong ones, followed again by four smaller ones. Bibron found a free space in front of the longer teeth, because the two small ones before them were detached.

The nine palatine and fourteen pterygoidal teeth are still smaller, decreasing in size from the front palatal tooth. It is therefore very fortunate that Brandt's name has the priority, as neither Bibron's "*Monodiastema*" nor Duméril's "*Chorisodon*" would be very suitable appellations for this form. The lower jaw has on each side eighteen teeth; they increase very rapidly from the first to the fourth, which is followed by fourteen smaller ones. Bibron counts twenty-five; I might have found the same number, or more, if I had reckoned the changing teeth on the inner side. The form of the transversal and pterygoidal bone is the same as in *Cœlopeltis*, and not as in *Psammophis (moniliger)*.

I can hardly add anything to the external description given by Lichtenstein and Bibron. The front part of the frontal (vertical) plate is either straight, or it forms a very obtuse angle; the loreal is curved a little (see fig. 2); and all the specimens have nine upper and ten lower labials. One specimen has 192 abdominal scuta and 103 pairs of subcaudal scales; the second 189 abdominal scuta and 90 pairs of subcaudal scales; the third 189 and 99. All have the anal plate divided, and seventeen longitudinal rows of scales. All have four large dark olive-coloured bands and a smaller middle one on the head. In one, all four bands continue to the end of the tail; the second shows, as described by Bibron, no lateral bands, but three rows of small dark spots on the dorsal part; and the third has neither lateral nor dorsal strokes, the head-bands being lost on the neck. One of them has the lips and the under part of the head yellow, and without any spots; in the two others the labials and the chin are dotted with black. All have the middle of the abdominal scuta dotted with black, and a black longitudinal stroke on their external parts, which forms on each side an uninterrupted line to the end of the tail. The rest of the under side is yellowish, but appears to have been during life of a red colour.

	A.	B.	C.
Total length . . . . .	1 <sup>m</sup> ·065	1 <sup>m</sup> ·115	1 <sup>m</sup> ·065
Length of tail . . . . .	0·28	0·25	0·27
— of head . . . . .	0·022	0·024	0·025
Distance of eyes . . . . .	0·006	0·007	0·007
Breadth of head behind . .	0·010	0·010	0·010
Greatest breadth of body . .	0·012	0·015	0·014

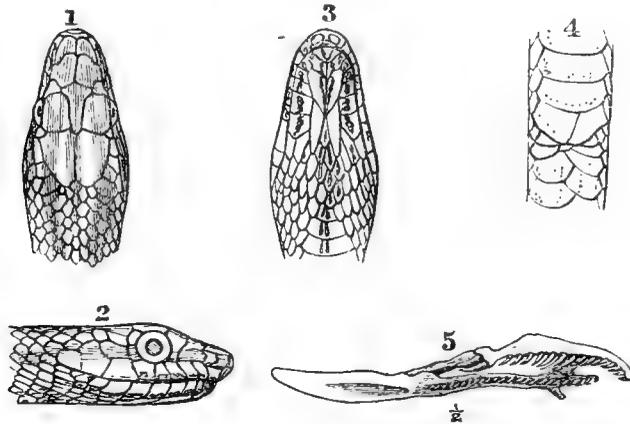
The largest specimen contained in its stomach three species of lizards, viz. *Phrynocephalus helioscopus*, Pallas, *Eremias velox*, Pall., juv. (*vittata*, Eversmann), and *Eremias variabilis*, Pall.

*Conclusions.*—1. *Chorisodon sibiricum*, Dum. & Bibr., does not come from Siberia properly so called, but from the sandy deserts of Central Asia, around Lake Aral and the Caspian Sea.

2. The row of unfurrowed maxillary teeth is not interrupted by a diastema.

3. *Chorisodon* is closely allied to *Cœlopeltis*; it would therefore be most unnatural to separate them into two different families.

4. The name *Chorisodon sibiricum* (date 1854) must be rejected, as it applies to the same species which had been named in 1837, by Brandt, *Taphrometopon lineolatum*.



EXPLANATION OF FIGURES.

Figs. 1-3. Head, viewed from different sides. Nat. size.—Fig. 4. Anal region. Nat. size.—Fig. 5. Maxillary, palatal, and pterygoid bones, with the teeth, from the right side. Twice magnified.

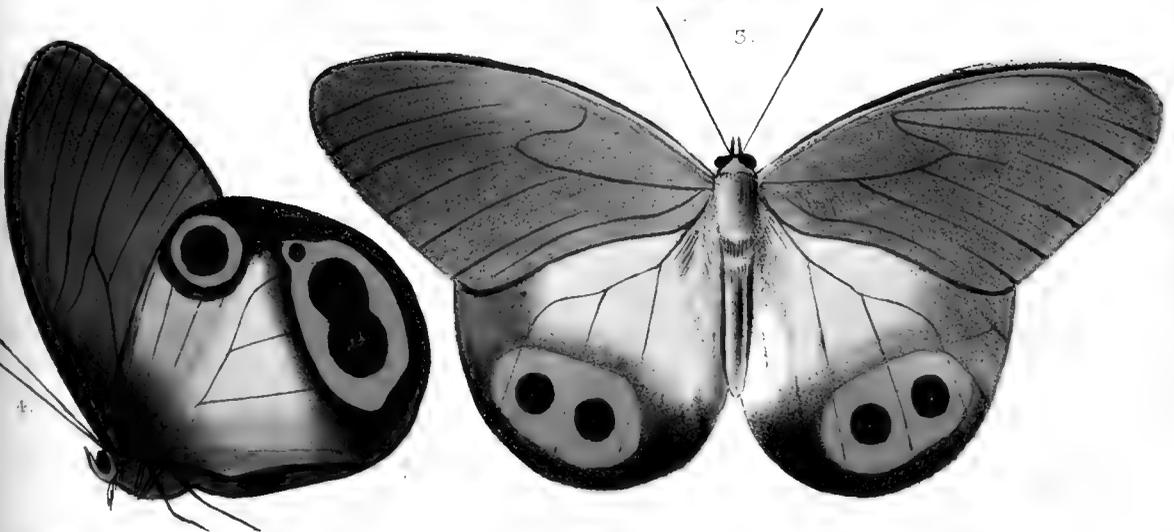
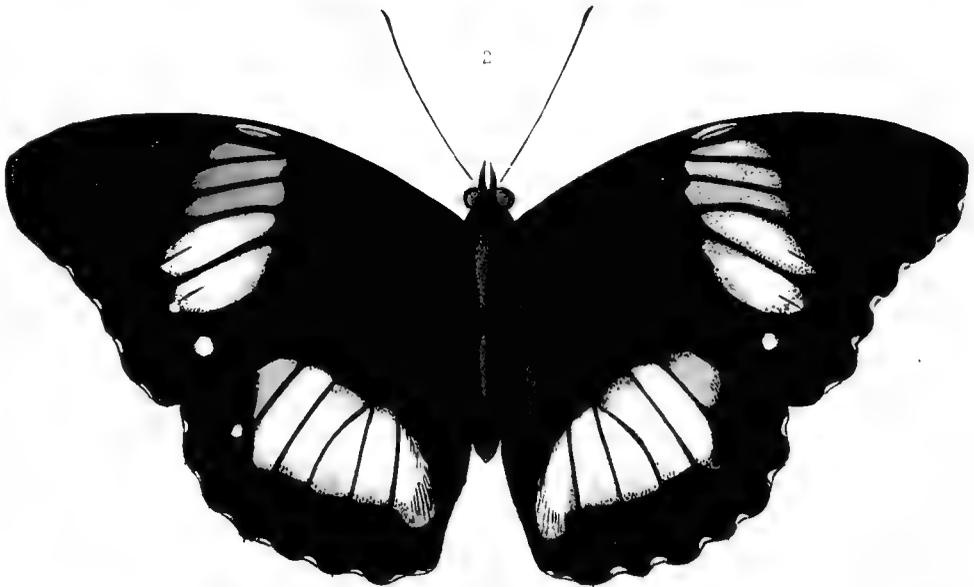
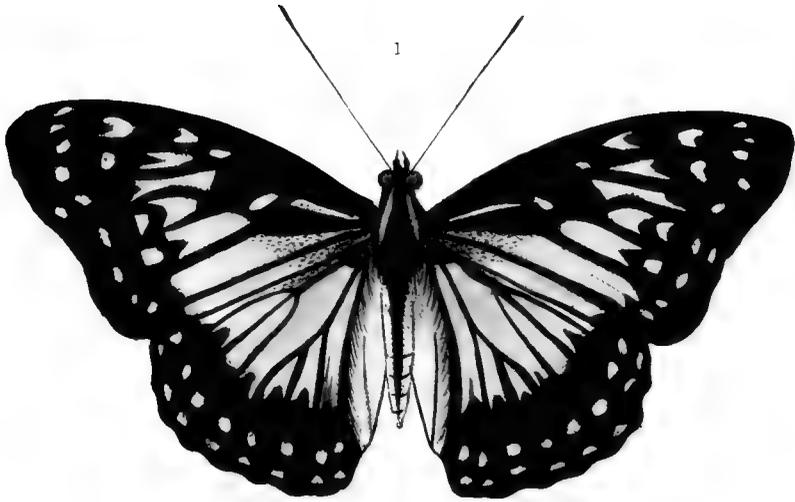
### 3. DESCRIPTIONS OF SOME BUTTERFLIES FROM THE COLLECTION OF MR. WALLACE. BY W. C. HEWITSON.

(Plates VIII., IX.)

#### DIADEMA DIVONA. (Pl. VIII. fig. 1.)

*Alis omnibus nigris, duplici serie submarginali macularum flavidarum, anticis ante medium fascia lata macularum oblongarum serieque macularum flavidarum, posticis basi ad medium flavidis, venis nigris.*

Upperside, male: dark brown, rufous towards the anal angle of the posterior wing. Anterior wing with numerous bands and spots

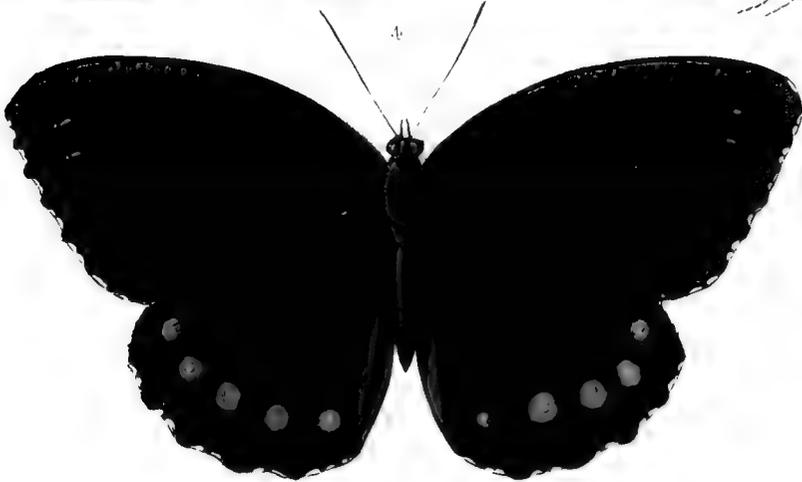
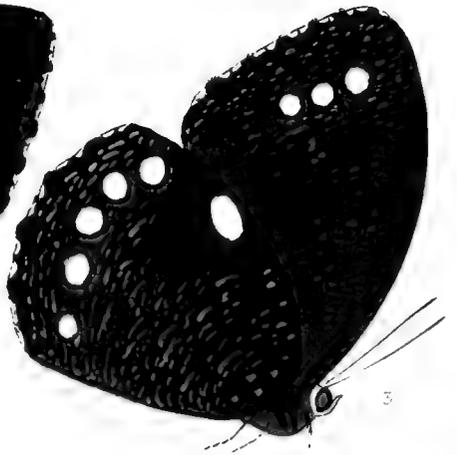


W.C. Hewatson, del. & lith. 1861

Printed by Hullmandel & Walton

1 DIADEMA NIXONA      2 DIADEMA PIONIA  
3 4 DRUSILLA POMTULA





Hewitt, J. Del. et. Sculp. 1861

Printed by Hullmandel & Walter.

1. 2. MELANITIS MIMALON.

3. 4. MELANITIS LEUCOCYMA



*Faint, illegible text impression, possibly a signature or stamp, located in the lower-left area of the page.*

of pale yellow. A line and two small spots within the cell; crossed before the middle by a broad macular band of irregular unconnected spots, the first two spots near the costal margin hastate (the second of them preceded by a small spot), the rest oblong (the last extending to the base of the wing), followed by a band of five spots; all yellow. Posterior wing with the basal half yellow, divided by broad black nervures. Both wings crossed by two submarginal bands of yellow spots—the first distinct and round, the second (near the margin) minute and linear; the margin also spotted with white.

Underside as above, except that the anterior wing has two white spots at the base of the costal margin, that the spots in the cell are larger (the linear spot occupying the whole base of the cell), and that the transverse band is broader and continuous; that the posterior wing has four white spots at the base, and the costal margin rufous.

Exp.  $3\frac{1}{2}$  inches.

*Hab.* Moluccas.

In the collections of A. R. Wallace and W. W. Saunders.

**DIADEMA DIOMEA.** (Pl. VIII. fig. 2.)

*Alis omnibus nigris fasciis latis transversalibus liliaceo-albis, anticis macula alba anali, posticis serie submarginali macularum albarum.*

Upperside, male: black. Both wings crossed transversely by a broad band of lilac-white, divided into six parts by the nervures, which are broad and black. Anterior wing with a distinct white spot near the anal angle, followed by three small indistinct spots. Posterior wing with four small white spots between the nervures, just beyond the central band, two of them near the apex, two near the anal angle; a submarginal band of white spots, in pairs. The outer margin of both wings spotted with white.

Underside as above, except that the anterior wing has the central band much broader, the costal margin near the base irrorated with white, and three small white spots within the cell; that the posterior wing has a white oval spot at the middle of the costal margin, the transverse band broader near the anal angle; and that both wings have two bands of white spots near the outer margin: the first band, of triangular spots, in pairs; the second, nearer the margin, of lunular spots, scarcely seen at the apex of the anterior wing.

The female differs only in its greater size, and in having the transverse bands white.

Exp.  $4\frac{2}{10}$  inches.

*Hab.* Moluccas.

In the collections of A. R. Wallace and W. W. Saunders.

**DRUSILLA DOMITILLA.** (Pl. VIII. figs. 3, 4.)

*Alis omnibus supra rufo-fuscis, posticis basi pallidiore, macula magna submarginali fulva, ocellis duobus nigris cæruleo-pupillatis ornata; subtus obscurioribus, posticis brunneis in medio albis ocello minuto (in exemplis nonnullis) cæteris proximo alteroque magno apicali.*

Upperside, male: pale rufous-brown. Posterior wing lighter near the base, the abdominal fold nearly white, the anal angle and outer

margin darker brown, with, near the middle of the outer margin, a large oval orange spot marked with two black ocelli, each with a centre of blue.

Underside as above, except that the bases of both wings, the abdominal fold, and the outer half of the posterior wing are dark brown; that the large orange spot is (in some examples only) extended towards the apex, so as to contain a minute ocellus; that the two ocelli are so enlarged as to meet in the middle; and that there is a large ocellus at the apex bordered with orange.

The female does not differ, except that it is much larger, with greater proportionate breadth of wing.

Exp. ♂  $3\frac{7}{10}$ , ♀  $4\frac{9}{10}$  inches.

Hab. Batchian.

In the collections of A. R. Wallace and W. C. Hewitson.

This can scarcely be another variety of a most variable species. I fully believe that there is as yet but one other species of the genus *Drusilla*, and that all the butterflies hitherto described and figured, to which I have given references below, are only varieties of *Drusilla urania*.

I believe that *D. horsfieldii* of Swainson is simply a male variety of *D. urania*; that *D. catops* and *D. selene* of Boisduval's MS., described by Westwood in the 'Genera of Diurnal Lepidoptera,' page 335 = *D. phorcas* and *D. mylæcha* of Westwood in the Transactions of the Entomological Society, n. s. vol. iv. p. 182, pl. 21 = *D. myops* and *D. macrops* of Dr. Felder in the 'Wiener Entom. Monatschrift,' vol. iv. pp. 109, 248, and pl. 1 = *D. artemis*, *D. anableps*, and *D. dioptica* of Vollenhoven in the 'Nederlandsche Entom. Vereeniging,' are all referable to one species. They differ from each other (just as the butterflies do which I have figured, in a former Plate of these Proceedings, under the name of *Melanitis melane*) in the position and quantity of the white on the surface, in the size and perfection of the ocelli, and their distance from the outer margin. Each genus seems to mimic the other in its general appearance, and each runs into the same extravagant varieties. If the butterflies which are enumerated above are to be considered as good species, there are several more in the collection of Mr. Wallace waiting for the same distinction. One lately arrived from Ceram has the whole underside of a uniform dark brown.

#### MELANITIS MIMALON. (Pl. IX. figs. 1, 2.)

*Alis omnibus purpureis, marginibus griseis; subtus brunneis ubique griseo undulatis, posticis macula alba prope medium marginis costalis.*

Upperside, male: purple, with a submarginal band of grey; the margins dentate and spotted with white.

Underside dark brown, undulated throughout with grey. Posterior wing with two minute spots near the base, a round spot near the middle of the costal margin, and some minute spots parallel to the outer margin, all white.

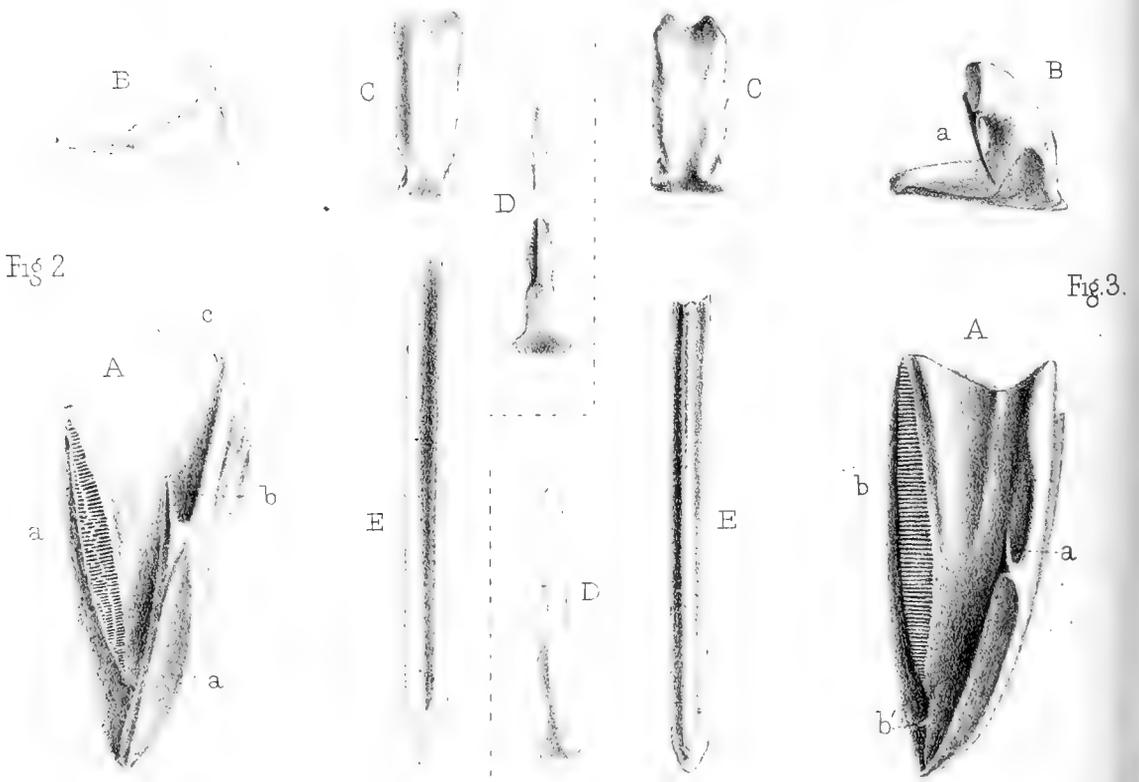
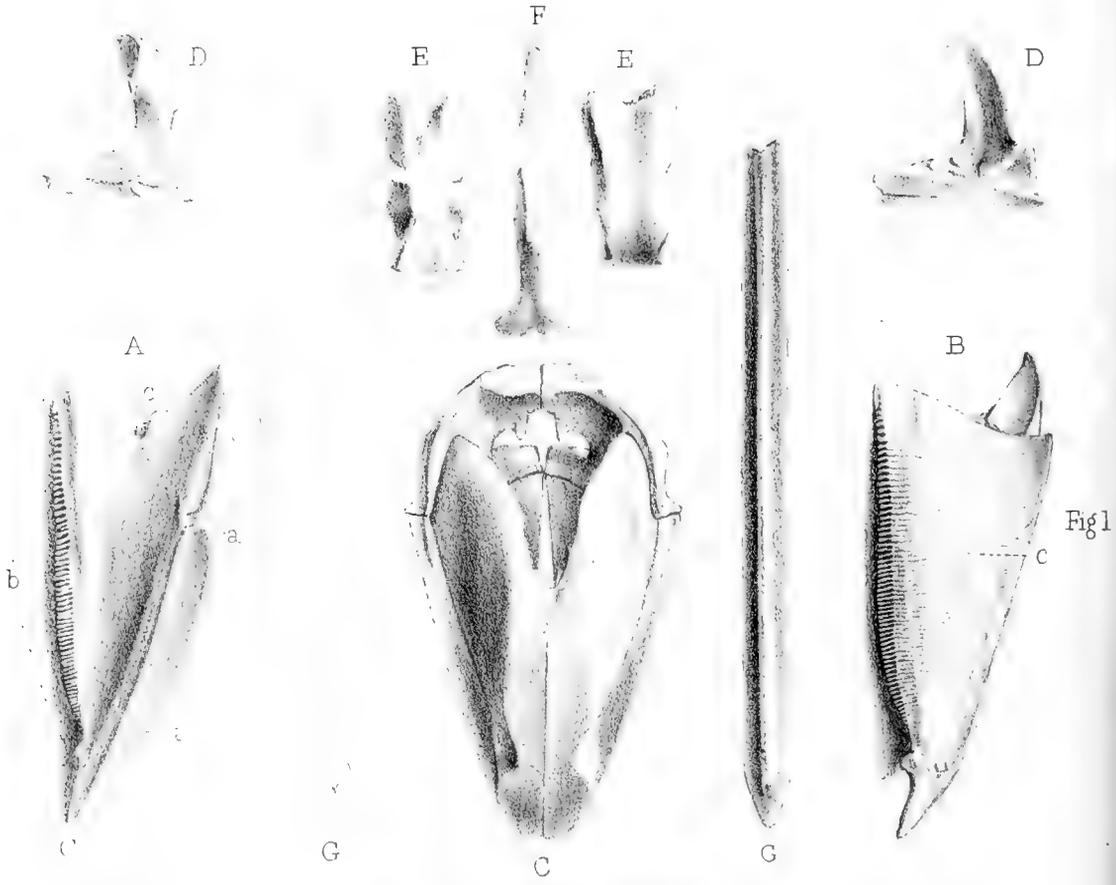
Exp.  $3\frac{3}{10}$  inches.

Hab. Manado, Celebes.

In the collection of A. R. Wallace.

STITCHED





Geo West lith.

W West imp.



Fig 1

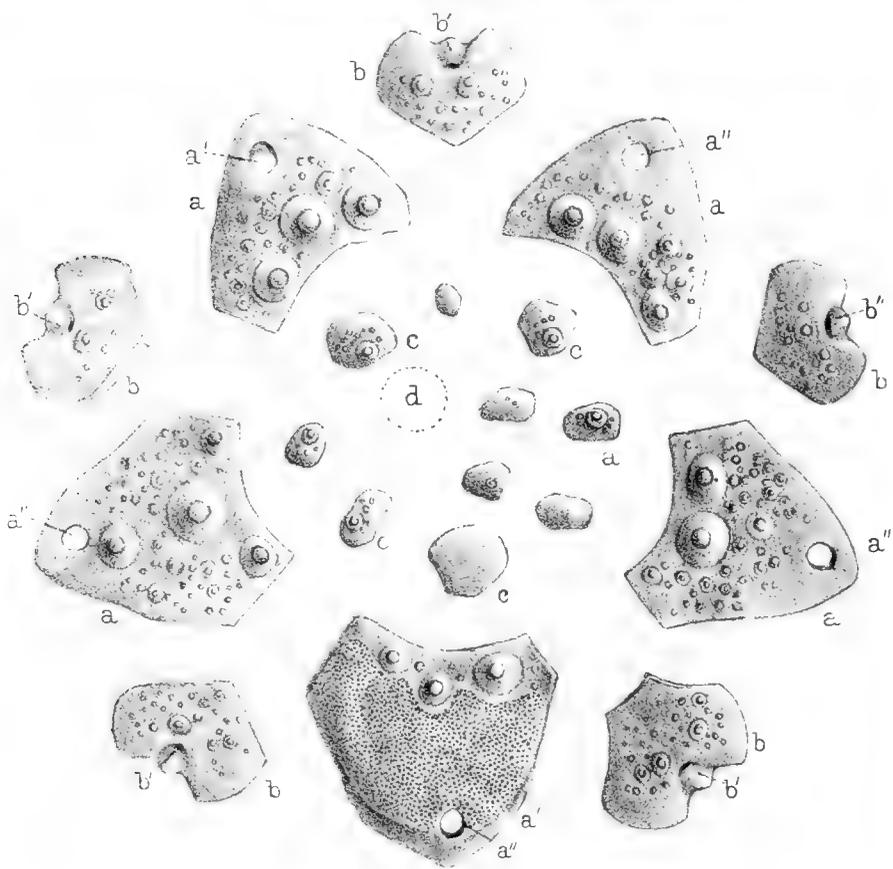
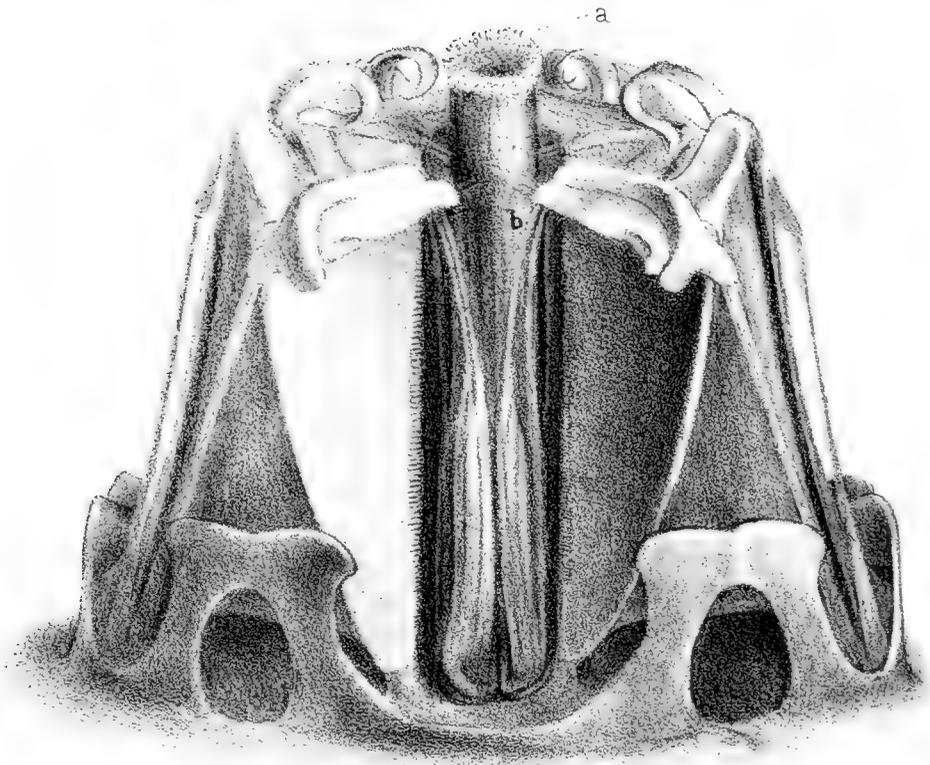
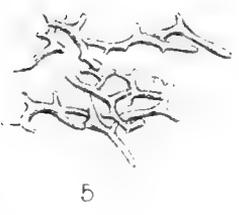
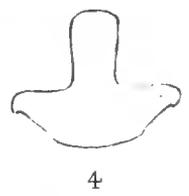
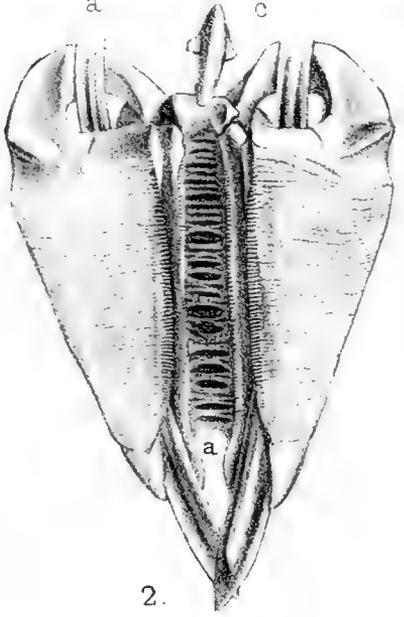
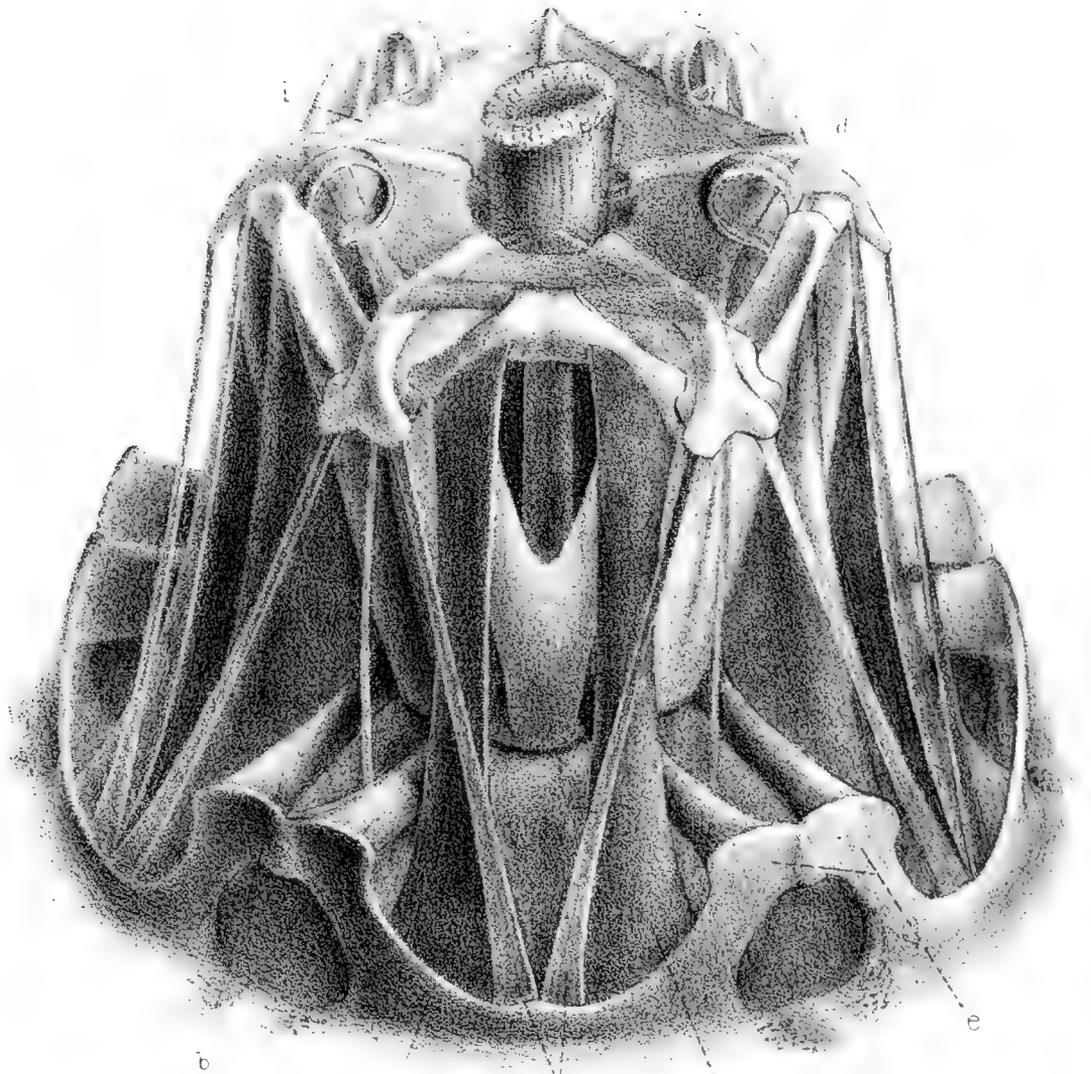


Fig. 2.





## MELANITIS LEUCOCYMA. (Pl. IX. figs. 3, 4.)

*Biblis leucocyma*, Godart, Encl. p. 326.

*Alis omnibus brunneis, marginibus griseis, anticis maculis duabus minutis prope apicem, posticis serie submarginali macularum liliaceo-albarum; subtus brunneis, ubique griseo-undulatis, posticis macula alba prope medium marginis costalis.*

Upperside, male: dark brown, with a submarginal band of grey, the outer margins dentate and spotted with white. Anterior wing with two or three small white spots near the apex. Posterior wing with a submarginal band of five, round, lilac-white spots.

Underside rufous-brown, undulated throughout with grey, with a band of large white spots parallel to the outer margin; anterior wing with three or four; posterior wing with five. Posterior wing with an oval white spot near the middle of the costal margin.

Exp.  $3\frac{1}{2}$  inches.

*Hab.* Celebes.

In the collections of A.R. Wallace and W. C. Hewitson.

*Dyctis agondas* of Boisduval and *Morpho bioculatus* (*Dyctis bioculatus* of Westwood in the 'Genera of Diurnal Lepidoptera,' pl. 54\*, which is its female) belong to this genus, and do not differ in the least, in their generic character, from the other species of *Melanitis*. Deceived by its great variability and the wretched figure of *D. agondas* in the 'Voyage of the Astrolabe,' I have figured, in a former Part of the Proceedings of the Zoological Society (Annulosa, Pl. LV.) a beautiful series of Butterflies from the collection of Mr. Wallace, under the name of *Melanitis melane*, which I now believe to be varieties of the said *Dyctis agondas* and *D. bioculatus*.

#### 4. OBSERVATIONS ON THE ANATOMY OF THE ECHINODERMS. BY THOMAS HOWARD STEWART, M.R.C.S., F.Z.S., ASSISTANT CONSERVATOR, HUNTERIAN MUSEUM.

(Plates X., X. A, XI.)

There are certain points connected with the anatomy of the Echinoderms which I am anxious to lay before the Society; and the more especially do I desire to do so, as I am not able to find any true and accurate description existing of the very wonderful apparatus for the prehension and division of food, which some of the higher groups of this class possess. I mean higher groups with regard to the class itself. The animals forming this class, from their organization, are placed low in the scale of creation, being just above the Polypifera and below the Annelida; yet we shall find, in the order *Echinoidea* of this class, animals possessing what may be called a *splanchnic* or oral skeleton, of so complicated and yet so efficient an arrangement, as cannot fail to make us wonder at the object of its sudden appearance in the anatomy of animals; nor can we help admiring the beauty, and wondering at the perfection of the work. Those who have not searched into the anatomy of these lower forms of life might be surprised to be told that a creature just above the common Sea-anemone, with an almost invisible nervous system, and other-

wise very low organization, possesses jaws (or, as I prefer to call the apparatus, a splanchnic skeleton) of a more complicated arrangement than any other animal in existence, from a simple sponge or *Amæba* up to man himself. This splanchnic skeleton, in *Cidaris*, *Echinus*, and allied genera, is formed of forty separate calcareous portions, arranged in a conical form, and, as we shall see by description and inspection of the specimens on the table, beautifully and perfectly articulated together, and having forty separate muscles to move the teeth in various ways.

If we take up an *Echinus*, or Sea Urchin as it is commonly called, and look at the flattened under-side, we see in the centre a circular part which is membranous, and continued over the corona to the points of the five protruded teeth. This *peristomal* membrane is covered in most of the *Echini* (not in our beautiful *E. Flemingii*, however) with minute, oval, and somewhat irregularly scattered calcareous plates, not (as in the rest of the corona) articulated together, but with intervals between each other, leaving the membrane partly bare. On these calcareous particles are placed organs called *pedicellaria*, and also, on some, minute spines, the tubercles for which may be seen with a lens; these particles are of various sizes. Around the teeth, on the peristomal membrane, are situated, ambulacrally, five pairs of large oval plates, each with a pit excavated in the centre, and having a minute perforation, over which is placed externally a modified form of cirrus. Internally an exceedingly small vessel comes from each perforation and joins the large longitudinal ambulacral vessel: these plates are also covered with numerous tubercles for minute pedicellaria. To this series of plates succeeds a soft circular lip, containing excessively fine particles of lime in a radiating linear arrangement, not bearing either pedicellaria or spines, and immediately surrounding the protruded points of the sharp, hard, white, Rodent-like teeth.

Seeing these points of teeth in so humble an animal—and the first appearance of such, makes one, like a child with a new toy, long to see the interior. We set to work to open the shell, as erroneously called, of our *Echinus*. We there find, besides the intestines and other viscera, a complicated conical apparatus surrounding the first part of the alimentary canal, and enclosing the rest of the teeth (previously unseen), and having attached to it all the numerous muscles which act on it. Now it is to this that I principally wish to draw your attention.

In the first place, I will enumerate the parts which make up these curious jaws. There are ten triangular pieces, called *alveoli* (Pl. X. fig. 1), which when articulated together form five prismatic-shaped sockets for the five teeth, and all together constitute a conical mass, with the apex external, formed by the points of the teeth. The apices of the alveoli are firmly fixed to the peristomal membrane; but the lip is loose over the teeth. The bases of the alveolar pairs are united by wedge-like pieces called *falces* (Pl. X. fig. 3), five in number, on each of which is placed an arched portion, divided into two; there are ten pieces arching over the external surface of the alveoli at the base, which may be called the *epiphyses* of the alveoli,—making in

all forty separate parts. The alveoli, when separated, are seen to be triangular in shape: they have a broad external rounded surface, presenting a deep hollow excavation; at the bottom of this is a groove in which is inserted a muscle. The surfaces opposed to the next pair of alveoli are finely striated; and these striæ may be seen to be continued as free points, forming a finely toothed margin on the œsophageal border; to each of these surfaces a muscle is attached, passing from one to that adjoining in the next pair. The remaining surface presents the half of the groove for the tooth, which is completed by the other alveolar piece, and also the symphysis that unites the two portions. The epiphyses arch over the upper or basal part of the alveoli on their outer borders, and serve as attachments for muscles. The *radii* are long, slender, arcuated portions, situated on the upper part of the oral skeleton between the pairs of epiphyses of the alveoli and above the falces: the œsophageal end of each is articulated with the centre of the inner end of the falces; this portion is rounded; but just above the point at which they are divided transversely they are laterally compressed, and here a muscle is inserted; they are then rounded again, and end by a flattened and bifurcated free extremity, forming points for the attachment of the tendons of slender muscles. The falces are somewhat square portions, which fit accurately between the pairs of alveoli, at their base; the œsophageal end has a deep notch, to the centre of which the radius is articulated, and on either side of this the œsophageal ligaments are attached. The teeth, five in number, are in shape somewhat like the incisor tooth of a Rodent; they have a hard, triangular, pointed prehensile end, and towards the root they become gradually soft and friable, and, when dry, split up easily into fine silky fibres; they are covered at their roots by a loose bag or pouch of the membrane of the perisome, which also connects the intervals between the muscles and the various parts of the splanchnic skeleton. The alveoli and teeth are, when in natural position, inter-ambulacral, the radii and falces being ambulacral.

With regard to the numerous muscles supplied to the apparatus, amounting to *forty* in number, there are first to be mentioned *five pairs* of what may be called *protractores* (Pl. X. A. fig. 1 *a*), arising from the interambulacral region of the oral edge of the corona, and inserted into the upper and lateral borders of the epiphyses of the alveoli, and into a groove on the external surface of the alveoli themselves: their office is thus plainly seen, when acting together, to be to protrude the points of the teeth—or as protractors; and when acting singly, to draw the teeth to one side or another. There are *five pairs* of muscles arising from the inner surface of the auricular arches, and inserted into the oral ends or apices of the alveoli, on the inner side of these (Pl. X. A. fig. 1 *b*); they are obviously retractors (*retractores*), and antagonistic in their action to the preceding set. Another set of five pairs of slender muscles arises immediately in front of the protractor group, by a thin, narrow common origin, and terminates by two slender tendons which pass obliquely to be inserted into the bifurcated free ends of the radii. These are the radial muscles or *radiales* (Pl. X. A. fig. 1 *c*): their action is to bring the points of

the teeth together, and in opposition to the next group of five (not pairs), which pass from one radius to another internally and parallel with the epiphyses of the alveoli, and assume, when connected with the five radii, a pentagonal form on the upper part of the conical oral skeleton : these are the *interradiales* (Pl. X. A. fig. 1 *d*), and act so as to separate the points of the five teeth. But there are yet five more muscles, of great importance to the object of this paper : these pass from one alveolar pair to another, being attached to their serrated surfaces as short, coarse individual fibres : they are the *interalveolar* muscles (Pl. X. A. fig. 2 *a*), and their action is to move the points of the teeth on each other in cutting the food. When a muscle is fixed into a bone or hard substance, there is generally, I believe always, a mark left of that attachment ; and this is the cause of these alveoli being serrated as described. They are said by anatomists to be grinding-surfaces ; but this cannot be, when the food cannot get near them, and they are covered by muscles. When we examine this oral apparatus in a fresh state, we find that the œsophagus is most firmly fixed around the apices of the alveoli internally, where they are themselves attached to the peristomal membrane ; and when the teeth protrude, the œsophagus then takes its course through the centre of the conical oral apparatus, being borne up by the five pairs of ligaments, each of which passes as a broad band from the commencement of the œsophagus, and is attached to the bifurcated inner ends of the falces. Now, if the alveoli on their serrated surface or border were used to grind the food, how is the food to get to them ? It must pass through the œsophagus, and thence to the rest of the alimentary canal ; and for it to get near the alveoli, the alveoli must grind the œsophagus itself. We may as well call the muscular impression on the shell of an oyster or any other bivalve, or that caused by the impression of muscles on our own bones, grinding-surfaces, as say that the alveoli of the *Echinus* are grinding-organs.

In the different genera that I have had the opportunity of examining, I find that there are certain peculiarities which might almost form generic characters.

*Cidaris* differs from *Echinus* in the form of the tooth : in transverse section the tooth of *Cidaris* is semicircular or boat-shaped ; whilst the tooth of *Echinus* is somewhat T-shaped, having a ridge running down the inner surface ; the alveoli in *Cidaris* are more obscurely serrated on their opposed surfaces and œsophageal border than in any other genus ; and the epiphyses of the alveoli do not arch over and meet in *Cidaris*, as they do in *Echinus* ; and in *Cidaris* the falces and radii are also shorter than in *Echinus*.

In *Diadema* the shape of the tooth is like that of *Cidaris* ; the alveoli are serrated on the opposed surfaces as well as on the œsophageal border, and the serrations of the border are very long and fine ; at the basal end of the symphysis on each individual alveolus is a long hamular process, enlarged slightly into a flat free end, and the basal border of the alveolus is long, which also necessitates the epiphyses being lengthened. These epiphyses do not arch over, but are like those of *Cidaris* ; the falces and radii are more like those of *Echinus*. In the genus *Acrocladia* and *Echinometra*, at the end of

the symphyses of the alveoli, there is a sharp, and in some a very long and delicate styliform process, and one also corresponding from the epiphyses; these support the teeth in position: they do not exist at all in *Cidaris*, and are very rudimentary in *Echinus*. The auriculæ of *Cidaris* do not form an arch, as they do in *Echinus*, *Dia-dema*, and other genera.

The oral skeleton of *Clypeaster* is a modification of that of *Echinus*, but more simple. The *Ophiuridæ* have also a decided oral apparatus, differentiated from the other calcareous portions of their skeleton; it is a decidedly modified form of the splanchnic skeleton of *Echinus*. They have alveoli somewhat like those of *Clypeaster*; a perforated oblong plate is situated perpendicularly at the symphyses of these alveoli; and here are situated a number of small, square, chisel-shaped teeth, translucent and sharp at their free end, and thick and opaque at the attached end or root: there are five of these on each of the plates, and their points can meet so as to close the oral orifice. The Goniasters and the *Asterinæ* also, by means of their oral spines, can completely prevent the egress of food once taken into the stomachal cavity. The Solasters have beautiful fasciculated spines around the mouth, but they only partially or very slightly close the orifice, which in this Starfish is very capacious. The Urasters have five bundles, not quite closing the mouth.

There are some other points to be mentioned with regard to the antambulacral or anal ring of plates in the *Echinidæ*. This ring of plates is all in the *Echinus* that answers to the upper or antambulacral integument in the Star-fish.

The number of plates forming this part of the corona is ten,—five situated interambulacrally, *i. e.* one at the anal end of each interambulacrum; and five ambulacrally, or one at the end of each ambulacrum. The first are known as the genital plates; they are somewhat triangular in shape, with a semicircular border towards the peripygal membrane; these plates have a perforation for the exit of the generative products. Intermediately between these genital plates in the anal ring and at the anal end of the ambulacral series are much smaller triangular plates: these are called “ocular plates;” but as the *Echinus* has no eye, it is erroneous so to call them, and therefore I propose the name of “*inter-genital*” for them. At the point furthest from the anus they have a minute perforation; now, to this perforation can be very readily traced the longitudinal ambulacral vessels that are placed on a raised edge in the centre of each ambulacrum, and terminate at this orifice in the *inter-genital* plates, which, no doubt, is the orifice of exit of the fluid used in the ambulatory system after it has circulated in the body and done its service and is no longer of any use. The anus in *Echinus* is excentric; in *Cidaris* it is centric.

In connexion with the position of the *Echinoidea* in the animal series, it is interesting to know that, as in the class of polyps below them, there are spicula scattered loosely through their tissues, as well as agglomerated ones forming their *corona*. I have found spicula in the fleshy tubes of the cirri, in the membranous madreporic canal, in the generative organs, in the fleshy part of the stem of the *pédi-*

*cellaria*, and, very curiously, along the border of a spine that I have mounted in longitudinal section for microscopic observation. These spicula are much like those in some Sponges, except that in *Echinus* they are formed of carbonate of lime, whilst those of the Sponges are of silica.

In *Diadema* they take a somewhat triradiate form (Pl. X. A. fig. 5).

In *Comatula* also there are detached spicula in the internal membrane of the perisome, which, when mounted in Canada balsam, form beautiful polarizing objects.

The higher forms of Echinoderms, such as the *Holothuriadæ*, have their skeleton formed entirely of scattered spicula, except the oral ring; in each species the spicula are of a peculiar form: and all microscopists know the wonderful anchor-shaped spicula and plates in *Synapta* and the curious wheels of *Myriotrochus* and *Chirodota*.

#### EXPLANATION OF THE PLATES.

##### PLATE X.

Fig. 1. A separated segment of the splanchnic skeleton of *Echinus sphæra*.

- A. A single segment of an *alveolus*, showing the surface opposed to its fellow half.
  - . The symphysis. *b*. The œsophageal, dentated border. *c*. The superior border for the attachment of the epiphyses. *d*. The styloid process for the support of the tooth. *e*. The apex.
- B. The corresponding segment; the serrated surface opposed to the adjoining pair of alveoli displayed.
- C. The external surface of an alveolar segment.
- D. The epiphyses of the alveoli.
- E. The falx; upper and lower surfaces.
- F. The radius.
- G, G'. The tooth, front and side view.

Fig. 2. A separated segment of the splanchnic skeleton of *Diadema*.

- A. An alveolar segment, the surface opposed to its fellow half.
  - a*. The symphysis, below the well-marked groove for the tooth. *b*. The styloid process. *c*. The long slender hamular process. *d*. The œsophageal border, with long, slender, dentated processes.
- B. The epiphysis of the alveolus. D. The radius.
- C. The falx. E. The tooth.

Fig. 3. A separate segment of the splanchnic skeleton of *Acrocladia trigonaria*.

- A. An alveolar segment, the surface opposed to its alveolar half.
  - a*. The styloid process. *b*. The œsophageal border. *b'*. Dentation at the apex of this border.
- B. The epiphysis of the alveolus. *a*. Styloid process.
- C. The falx. D. The radius. E. The tooth.

##### PLATE X. A.

Fig. 1. A dissection of the splanchnic skeleton and muscles attached of *Echinus sphæra*.

- a*. The *protractores*. *b*. The *retractores*. *c*. The *radiales*. *d*. The *interradiales*. *e*. The *auricular arch*.

Fig. 2. A segment of the splanchnic skeleton of *Echinus sphæra*, showing the *interalveolar muscle* (*a*).

Fig. 3. A transverse section of the tooth of *Cidaris*, in outline.

Fig. 4. A similar section of the tooth of *Echinus*.

Fig. 5. Spicula from the cirri of *Diadema*.

Fig. 6. Spicula from the cirri of *Echinus*.

## PLATE XI.

Fig. 1. A dissection, showing the course of the œsophagus through the splanchnic skeleton of *Echinus sphæra*.

a. The œsophagus (cut end). b. The ligaments of the œsophagus.

Fig. 2. The antambulacral, or anal ring of plates of *E. sphæra*.

a. The genital plates. a'. The madreporic genital plate. a''. The genital orifice. b. The inter-genital plates. b'. The ambulatory orifice. c. The plates of the peripygial membrane. d. The position of the anus.

The following list of additions made to the Menagerie, by gift, purchase, and exchange, during the month of December, 1860, was read:—

1 Macaque Monkey .....	<i>Macacus cynomolgus</i> ...	Kennet Harris, Esq.	} Presented by
2 Wedge-tailed Eagles.....	<i>Aquila fucosa</i> .....	Dr. Mueller.	
2 Beavers .....	<i>Castor canadensis</i> .....	} Hon. Charles Ellis.	
1 Alligator.....	<i>Alligator lucius</i> .....		
2 Horned Lizards.....	<i>Phrynosoma cornutum</i>	} Richmond, Esq.	
1 Bonnet Monkey.....	<i>Macacus radiatus</i> .....		
1 Capuchin Monkey .....	<i>Cebus capucinus</i> ? .....	H. Alexander, Esq.	
1 Bahama Duck .....	<i>Pæcilonetta bahamensis</i>	} Received in exchange.	
2 American Boas .....	<i>Eumectes murinus</i> .....		
1 Ariel Toucan .....	<i>Ramphastos ariel</i> .....		
1 Tapir .....	<i>Tapirus americanus</i> ..		
1 Axis Deer, fem. ....	<i>Cervus axis</i> .....		
2 Ruddy Shieldrakes .....	<i>Casarca rutila</i> .....		
1 Purple Kaleegee .....	<i>Gallophasis horsfieldii</i> ...		
1 Suricate .....	<i>Suricata zenic</i> .....		
2 Rheas .....	<i>Rhea americana</i> .....		
1 African Horned Owl .....	<i>Bubo lacteus</i> .....		} Purchased.
2 Touracos .....	<i>Corythaix buffoni</i> .....		
5 Plantain-eaters .....	<i>Musophaga violacea</i> ..		
1 Grison .....	<i>Grisonia vittata</i> .....		
3 White-fronted Geese.....	<i>Anser albifrons</i> .....		
4 Linnets .....	<i>Linota cannabina</i> .....		
2 Twits .....	<i>Linota montium</i> .....		

Of these, *Bubo lacteus* was stated to be exhibited for the first time.

February 26th, 1861.

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

Dr. P. L. Selater exhibited a living specimen of a Water Tortoise (*Chelodina longicollis*) from South Australia. In answer to inquiries as to the exact locality of this animal, Mr. Paul Joske, by whom it was presented to the Society's Menagerie, had replied as follows:—

“ The Tortoise you refer to was found at a village called Hawthorne, on the River Yarra. The same animal is also to be met with in the Ovens district, in the immediate neighbourhood of the creeks. It feeds on the young and tender leaves of grasses and other succulent vegetation, and is popularly known as the Snake-Tortoise.”

The following papers were read :—

1. ON THE ANATOMY OF *REGENIA OCELLATA*. BY DR. A. GÜNTHER, FOR. MEM. Z.S.

The specimen of *Regenia ocellata* which lived in the Society's Menagerie for nearly half a year came from the West Coast of Africa and was 35 inches in length, and  $20\frac{1}{2}$  in its greatest circumference. It was very sluggish in its habits, and made more lively movements only when taken out of the cage and handled for some minutes; it then attempted to free itself by strokes of its powerful tail. The body always appeared broad, swollen, depressed; but its extent would be considerably increased, by inflation and expansion of the lungs, whenever it was touched. When first brought to the Gardens, it was offered frogs, fishes, and other living animals, but it never touched them, and, unlike other *Monitores*, it did not take to the water; subsequently it was fed with eggs and small pieces of meat.

The structure of the internal parts is very much like that of the other Saurians of the family *Monitores*, showing, however, some very remarkable peculiarities. The *tongue* is entirely the same as in the Snakes, except that it is flesh-coloured, and the anterior portion of the two points in which it terminates is cartilaginous, although soft and flexible; it is retracted into a thin and short sheath at its base, and stretched out as frequently and as far as that of a snake\*. The pharynx and the upper part of the œsophagus are of a black colour. The latter passes without distinct separation into the *stomach*, which has an elongate rounded form, one side being so much more dilated than the other that it may be called a *curvatura major*; its muscular membrane becomes more developed in the pyloric portion, and forms a true pylorus.

The commencement of the intestine is very peculiar: the portion behind the pylorus is for the length of 9 lines without any villi, but provided with numerous small glands; it is a *duodenum*, which is separated from the small intestine by a broad circular valve, at least  $2\frac{1}{2}$  lines deep: this valve, which is absent in *Iguana*, shuts the duodenum in so effective a way, that it requires considerable pressure to drive fluid backwards from the small intestine into the stomach. The *valvulæ conniventes* commence immediately behind that valve, and are provided with numerous very delicate and branched villi; they become more irregular towards the middle of the length of the intestines, and the folds of the mucosa assume a reticulated appearance, and are finally longitudinal in the middle part of the small intestine; the villi are here coarser and less numerous than in the upper portion, and not more fringed, having an average length of 2 lines. They cease altogether in the posterior part, in the *ilium*, whilst collections or rounded ovate patches of glands (*glandulæ Peyerianæ*) make their appearance; they are seen on the mesenterial side of the ilium as well as on the border opposite it. The opening of the ilium into the *cæcum* is comparatively small; and the latter is separated from the rectum by a fold of the mucosa, which is at least

\* The lower parts of the cavity of the mouth had been taken away before the specimen came into my hands.

8 lines broad. The length of the small intestine is 29 inches, that of the rectum, with the cæcum and cloaca, 3 inches.

The *liver* is large, divided by a comparatively small notch into a right and left lobe, the former being somewhat the larger. The gall-bladder is imbedded in an excavation of the substance of the liver, which penetrates to its parietal surface. The *heart* is received into the upper end of the groove which separates the two lobes of the liver, the pericardium being fixed to the ligamentum suspensorium. The conus arteriosus is well developed, and emits the art. pulmonalis, whilst a truncus arteriosus arises from the ventricle.

The *trachea* has the cartilaginous rings not closed on the dorsal side, and is divided into the two bronchi at some distance from their entrance into the lungs: they penetrate so far into the substance of the lungs, that they nearly reach their posterior extremity; and the length of each bronchus is equal to that of the undivided trachea: each bronchus opens by several lateral foramina, but emits only one short branch, which, again, is provided with incomplete cartilaginous rings. The *lungs* of both sides are nearly equally developed, and of moderate capacity; their interior is amply provided with cells and meshes, even in their posterior extremity.

The *kidneys* are of an elongate, pear-shaped form, entirely separated from each other, and of equal size. Each is formed by eight larger and some smaller lobes, which are united only at the base, the former making several convolutions. The ureters end in two small papillæ at the extremity of a large separate sac on the dorsal side of the rectum. As the urine is not received in this sac, but in the hindmost portion of the intestinal tract, we cannot consider it as a urinary bladder, although Cuvier describes such an organ in *Iguana* and *Tupinambis*. The secretion is, as usual, of a firm, chalk-like appearance.

The *ovaria* are equally developed on both sides; both exhibit the same degree of disease in the present specimen. The oviducts are of moderate width, and convoluted like the intestines; their ostium abdominale is wide, situated above the ovarium, and not fringed. The orificium uterinum is exceedingly narrow, on the tip of a large papilla which projects into the upper part of the sac mentioned. This sac is situated on the dorsal side of the rectum, and appears to belong exclusively to the generative organs.

*Fatty masses* are found in a great many reptiles, as, for instance, the *corpora adiposa* in the abdominal cavity of the Batrachians, or on each side of the abdomen of *Iguana* \*. Owen considers them as reservoirs of nutritious matter which is resorbed during the time of the torpid state, into which at least the former of those animals fall. In none, however, are those *corpora adiposa* so developed as in *Regenia ocellata*. They completely fill each side of the iliac region, and evidently give the broad, bulky appearance to the animal; they are contained in a separate sac of the peritoneum, and provided with numerous blood-vessels. Their greatest length is 7 inches, their greatest width 6 in., and their thickness in the middle  $1\frac{1}{2}$  in.; in weight they equal the fifth part of the weight of the entire animal.

\* Owen, Catal. Coll. of Surg.

Each of them is formed by larger and smaller separate lobes, which give it the appearance of the kidney of a Dolphin; only, the single lobes are larger, less numerous, and more irregular in size. When cut through, they cover the knife with a milky fat; and their consistence is altogether that of a fatty-degenerated liver. Although the animal appeared to be very muscular and very well fed, no fat was deposited at any other place.

The *cause of death* was a disease which had nearly entirely destroyed both the ovaria, and certainly greatly altered their natural form. The one which I have examined contained a great many irregular and lacerated cavities filled with extravasated blood. No trace of the folliculi could be distinguished. A rounded mass, of the size of a small walnut, enclosed in a tough membrane, surrounded by coagulated blood, and composed of a cheesy substance, is evidently an egg which had been developed during one of the previous breeding-seasons, but had been retained in the ovarium. A similar body can be felt in the other ovarium. The membranes coating the ovarium are covered with cysts of the average size of a lentil, some containing a gelatinous fluid, others matter. The neighbouring parts of the peritoneum were much inflamed; and the kidneys contained an unusual quantity of fluid blood. The rectum was filled with a large mass of hard, chalk-like urine; and it became evident from the excoriated state of the mucosa, that no discharge had taken place for a long time. All the other organs were quite healthy; and the animal had fed only two days previously to its death.

The preparation is preserved in the Collection of the British Museum.

2. NOTE ON THE REPRODUCTION OF THE RED RIVER-HOG (*POTAMOCHÆRUS PENICILLATUS*) IN THE SOCIETY'S MENAGERIE. BY PHILIP LUTLEY SCLATER, M.A., PH.D., SECRETARY TO THE SOCIETY.

(Plate XII.)

The accompanying drawing (Pl. XII.), executed by Mr. Wolf some time since, represents the immature form of the Red River-hog of Western Africa, which has of late years bred several times in the Society's Menagerie, although but two individuals of the produce have, unfortunately, lived to attain maturity. As our only male of this species is now dead, and we have but a single female left in the collection, it appears desirable that a short statement of the facts connected with the reproduction of this rare animal in captivity should be placed on record before they are entirely forgotten.

The first specimen of the Red River-hog obtained by the Society was purchased in Liverpool in September 1852, and was the example described by Dr. Gray in the Annals of Natural History as *Choiropotamus pictus*\*, and subsequently in the Society's 'Proceedings' under the rectified name *Potamocharus penicillatus*†. At the latter

\* Ann. N. H. ser. 2. vol. x. p. 280.

† P. Z. S. 1852, p. 131.



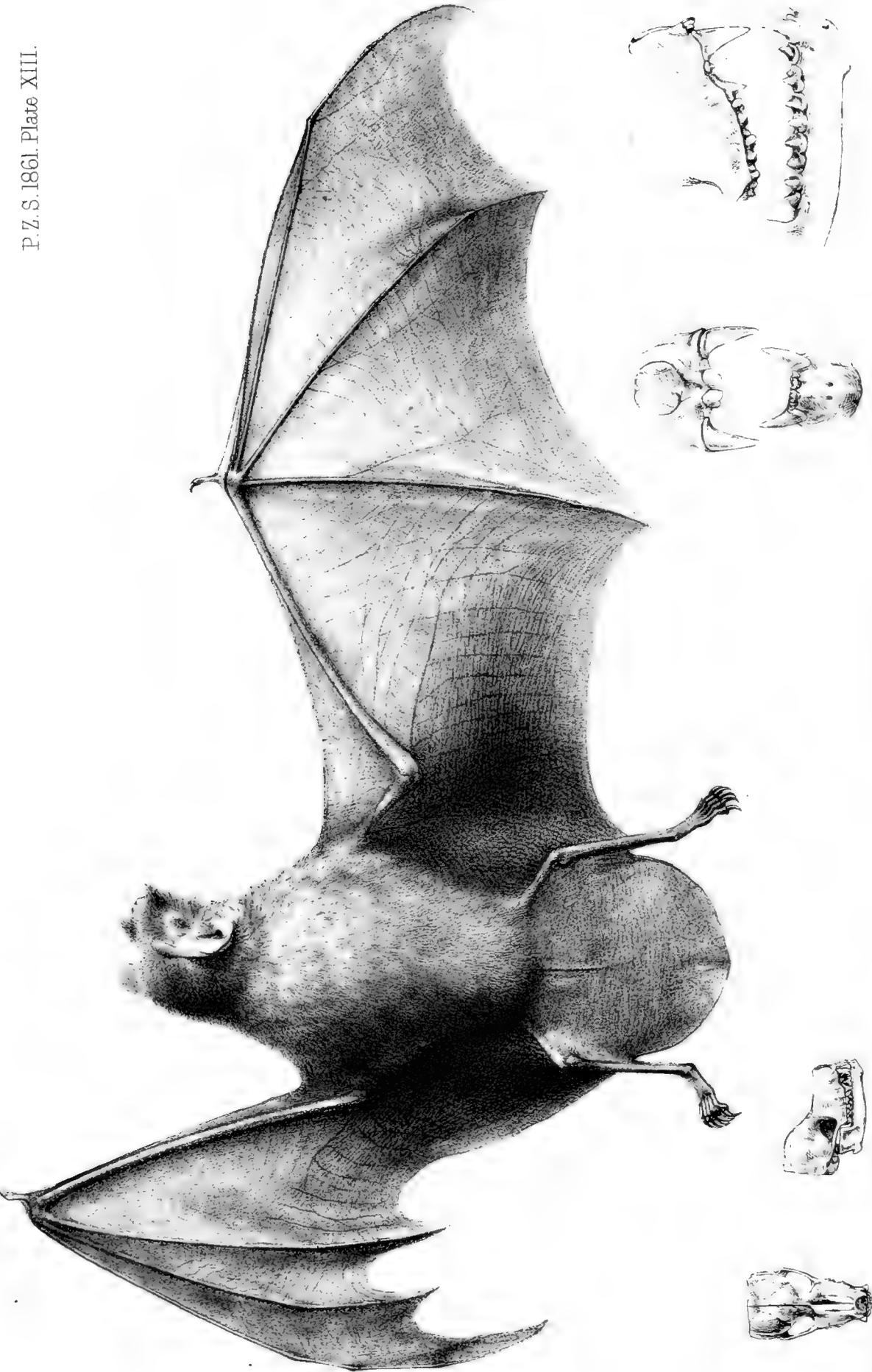
J Wolf. del et lith.

POTAMOCHÆRUS PENICILLATUS *fœm et juv*

M & N. Hanhart Imp.







CHILONYCTERIS OSBURNI.

G.H. Ford.

W. West. imp.

reference a good figure is also given of the adult animal. About two years afterwards, a female of the same species was received from Paris, having been obtained, through the good offices of the authorities of the Jardin des Plantes, from the French settlements in Western Africa. Upon being placed in company with the male, she produced a litter of three or four young ones in the summer of 1856, and again in August 1857, but on both occasions destroyed them all within a short period after their birth. In the following season a litter of three young ones, produced on June 4th, 1858, was attended with more fortunate results. One only of the young pigs perished, shortly after its birth; the other two, both females, are still living—one in the Society's Gardens, and the other in the collection of the Zoological Society of Amsterdam, to whom it was parted with in exchange for other animals.

In 1859 the female Red River-hog again produced a litter of four young ones (on October 24th); but our efforts to save them were quite unavailing, and they disappeared one by one, having been destroyed by their mother within a few weeks after their birth.

Mr. Wolf's figures give an accurate representation of the striped condition of these young Potamochoeres as they have appeared in our Menagerie. Several of them in this state of coloration are now in the collection of the British Museum, together with the original male of the species, which died in February 1860, and the old female, which died in the previous autumn.

The same striped condition of the immature animal is found in the young of the Wild Hog of Europe (*Sus scrofa*) and that of India (*Sus indicus*); but I am not aware of any corresponding stage in the young of the domesticated animal of this country; nor is there any sign of it in the young of the very curious Japanese variety of the domestic Pig, which has lately reproduced in our Gardens.

I may observe also that in the Peccaries (*Dicotyles*) (the *Suidæ* of the New World) the young resemble the adult in coloration, except in being lighter; and in the Wart-hog (*Phacochoerus*), judging from the young individual in the British Museum, the case is the same.

The nearest counterpart I know, of the immature dress of *Sus*, is to be found among the Tapirs, in two of which the young are somewhat similarly striped. But I am of course well aware that the Tapirs and Pigs are now referred to two distinct orders of Mammalia.

### 3. NOTES ON A COLLECTION OF MAMMALS MADE BY THE LATE MR. OSBURN IN JAMAICA. BY ROBERT F. TOMES, CORR. MEM. Z.S.

(Plate XIII.)

The collection, the species of which I am about to enumerate, is interesting from containing specimens of a Bat which has very recently been made the type of a new genus by Dr. Gundlach, and because it also contains specimens of the *Monophyllus redmanii* of

Leach, a genus and species which have not until now, to the best of my knowledge, been brought under notice, excepting by the unsatisfactory description of the wretched type specimen of Dr. Leach. Of this I shall have more to say in a subsequent communication.

1. *MUS RATTUS*.

2. *MUS TECTORUM*.

In so far as external appearances are concerned, these specimens differ in no way from European ones. They must be regarded as settlers in the island.

3. *CAPROMYS BRACHYURUS*, Hill, in Gosse's Naturalist's Sojourn in Jamaica, p. 471.

A single specimen, which has not perhaps been sufficiently examined to determine with absolute certainty its synonymy.

4. *ARCTIBEUS PERSPICILLATUS*, Linn. sp.

*Phyllostoma perspicillatum*, Geoff.

*P. superciliatum* et *P. obscurum*, Pr. Max.

*Arctibeus jamaicensis*, Leach & Horsfield.

*Arctibeus carpolegus*, Gosse, Nat. Soj. in Jam. p. 271.

*Phyllostoma planirostre*, Spix?

After the examination of many specimens from the West Indian Islands and the continent of America, I am fully persuaded that they are all referable to one species, and that that species is the *Vespertilio perspicillatus* of Linnaeus. There is, I admit, considerable difference in the size of the different individuals, the island specimens being smaller and darker-coloured than those from the mainland; but as this is the case with the other Bats which inhabit alike the West Indian Islands and the continent of America, it cannot be advanced as evidence of these two being distinct species, but rather the reverse.

5. *ARCTIBEUS BRACHYOTUS*, Pr. Max. sp.

*Phyllostoma brachyotum*, Pr. Max.

*Arctibeus jamaicensis*, Gosse, Nat. Soj. in Jam. p. 271.

*A. achradophilus*, Gosse, Nat. Soj. in Jam. p. 271.

*A. sulphureus*, Gosse, Nat. Soj. in Jam. p. 271.

I have compared the specimens in the present collection with the types of *A. jamaicensis*, *A. achradophilus*, and *A. sulphureus* of Mr. Gosse in the British Museum, and again with the specimen of *Arctibeus brachyotus* formerly in the Museum of this Society, so named by Mr. Waterhouse; and find them to be identical.

6. *MONOPHYLLUS REDMANII*, Leach.

*Glossophaga caudifer*, Geoff.?

Five specimens, obtained by Mr. Osburn in Oxford Cave, Manchester, in February 1859. I have compared some of these with the type in the British Museum. It is probable that this is the *Glossophaga caudifer* of M. Geoffroy St. Hilaire.

7. *MACROTIS WATERHOUSII*, Gray.

The present species would appear to be common in Jamaica, if we may judge from the number contained in the present collection as compared with the other species. Some of these specimens, from the unossified condition of the joints of their fingers, are obviously immature, and enable me to state that the older examples are of a more decidedly rufous tint than the younger ones.

8. *PHYLLONYCTERIS POEYI*, Gundlach, Monatsb. der Königl. Akad. der Wiss. zu Berlin, Dec. 1860, p. 817.

This singular genus, lately characterized by Dr. Gundlach, has much the general appearance of *Brachyphylla*, but is probably more nearly allied to *Monophyllus*, although generically quite distinct. Mr. Osburn's four specimens were collected at Harmony Hall, Trelawny, in June 1859.

9. *NATALUS STRAMINEUS*, Gray.

*Nyctiellus lepidus*, Gerv.

*Spectrellum macrourum*, Gerv. ?

These specimens from Jamaica, obtained in Oxford Cave, Manchester, in February 1859, differ from those which I have previously described from the continent of America, in being smaller and rather darker in colour.

The *Nyctiellus lepidus* of Gervais is clearly the present species; and I have but little doubt that his *Spectrellum macrourum* is identical with the larger American specimens.

10. *MORMOOPS BLAINVILLII*, Leach.

Examples are labelled "Freeman's Hall" and "Sportsman's Cave."

Specimens of this species which I have seen from South America are larger than those from Jamaica, and usually deeper in colour. Some of those in the present collection have the under parts of a pale rusty-red colour.

11. *CHILONYCTERIS QUADRIDENS*, Gundl.

*Lobostoma quadridens*, Gundl. Wieg. Archiv, 1840, p. 358.

*Chilonycteris grisea*\*, Gosse, Nat. Soj. in Jamaica, p. 326, 1851.

Five ex. from Oxford Cave.

Mr. Gosse describes and figures his *C. grisea* as having "four points" in the prominent upper margin of the nose-disk; and it was this peculiarity which induced Dr. Gundlach to bestow the above specific name of *quadridens* on a specimen from Cuba. The dimensions also of the species described by these two gentlemen being so nearly similar, leaves no reasonable doubt of their identity.

\* *Chilonycteris macleayi* and *C. fuliginosa* are closely allied to this species, if not identical with it.

12. *CHILONYCTERIS OSBURNI*, n. sp. (Pl. XIII.)

The present species, of which six examples are in the collection obtained at Sportsman's Cave in Dec. 1858, appears to bear some resemblance to the *Chilonycteris gymnonota* of Natterer, at least so far as I can judge from the figure and description of that species in the fifth volume of Wagner's Supplement to Schreber's work on Mammalia. It is, however, manifestly larger than that species, and differs greatly in having the back well clothed with thick fur, and in having a differently-shaped tragus. Dr. Natterer's description of *C. gymnonota* in Wiegmann's Archiv for 1843 is as follows:—" *Ch. fusca, dorso nudo. Antibrachium 1" 8½'"*." This description, although very brief, is quite sufficient to distinguish it from the other known species, and therefore from the species which I am about to describe. The *C. rubiginosa* of Natterer agrees with *C. osburni* in having the back thickly hairy; but it is larger, and differs besides in several particulars, as I shall endeavour to show.

The top of the head is considerably more elevated than that of *C. rubiginosa*, about as much so as in *C. quadridens*. The muzzle differs greatly from that of both these species. The end of the snout is remarkably broad and flattened, the end or disk having a horse-shoe shape, the middle of which may be said to represent the end of the nose, and contains the nostrils; and the two descending ends form the upper lips. The nostrils are small, round, and have a slightly raised margin. In the centre of the upper part of the rim of this nose-disk is a notch, and from it, descending vertically between the nostrils, is a slight raised ridge; on the outside of the two nostrils there are two shallow notches in the rim of the nose-disk. On the top of the nose, and about a line and a half behind the nose-disk, is a prominence, which in this species is of an obtusely pyramidal form, rising more abruptly in front than behind, and which appears when seen in front like a second but narrower snout. In *C. quadridens* this projection is scarcely visible, and in *C. rubiginosa* it is simply a kind of nodular swelling.

The lower lip is broadly reflected, its lower margin being free and pendent; the centre of its upper edge consists of a narrow horizontal projection, which is enclosed below by a crescentic groove: and beneath this all the naked part forming the reflex part of the lip is covered with regular warty excrescences of a rounded form, which are much larger and better defined in the middle part than on either side, where they become small and indistinct. Below this part of the lower lip is a transverse fold or leaf, which is much more fully developed in this species than in *C. rubiginosa* (in which species its position is indicated by a mere line or seam), but much less so than in *C. quadridens*, in which it attains a leaf-like expansion of equal prominence with the lip itself.

The ears are shaped much like those of *C. rubiginosa*; but they are relatively broader at their base than in that species, and their outer margin is less deeply emarginate. Their upper or narrower part is relatively broader than it is in the smaller species *C. quadridens*; but the extreme tip is not so much rounded as in the latter species,

being, on the contrary, acute. The tragus is placed deep in the cavity of the ear, and is difficult to see; it is rather short, and of a peculiar form. Of medium breadth at the base, it expands on each side for a distance of a little more than half its length, and from this its widest part it decreases rapidly to a blunt point, from which spring a few long, fine, frizzled hairs. Near the base of the outer margin is a blunt angular projection; and in its opposite edge are two nicks, the one below its point of greatest breadth, and the other above it, leaving a kind of rounded lobe between them. Of these nicks (they scarcely deserve the name of notches), the lower one is the deeper. But the most remarkable feature in the tragus is the manner in which it strides over or embraces the *meatus auditorius*. Usually this passage passes under the tragus, from behind, near to its outer edge; but in this species\* the outer thin edge is split longitudinally at its base into two layers, one of which is in front of the *meatus*, and the other behind it, the latter being the smaller of the two. Thus the outer edge of the tragus may be said to stand astride of the meatus.

The thumb is of moderate length, and its basal phalange is rather shorter than the penultimate one. The antibrachial membrane is rather ample near the body, but disappears before reaching the thumb. The feet are rather long, the toes being half their length; and the claws are strong and much curved. The wing-membranes extend to the distal extremity of the tibia, over which they pass, and are attached to the root of the *calcaneum*, just as in *Natalus* and *Mormoops*.

The tail extends barely to the middle of the interfemoral membrane; and scarcely one-half of it is free above the membrane.

The ears are very hairy inside near their base, *i. e.* in front of the tragus, but not elsewhere, either inside or out. The fur of the forehead extends uninterruptedly forward to the posterior facial prominence, which it leaves free; but on the sides of the face it comes a little more forward, and forms two very conspicuous tufts of hair, which are thick, long, and straight, and have a forward direction, their points being quite as far forward as the end of the nose. Vertically these tufts of hair extend from the edge of the upper lip almost on to the top of the nose. The membranes are everywhere destitute of hair; they are finely reticulated and dotted near the sides of the body, the base of the interfemoral membrane, and the interbrachial membrane; under the distal extremity of the humerus they are broadly reticulated; the remaining parts of the membrane, *i. e.* those nearest the extremities, are nearly destitute of markings.

The fur of all the upper parts is short and shining, though not very fine; its general hue is dark grey-brown; it is indistinctly tricoloured—being dusky at the roots, then of a shining grey, and its tips dark greyish-brown; beneath, it is of two colours—dusky at the roots, its terminal half whitish-brown, without gloss, and palest along the middle of the abdomen. The cutaneous system is dark brown.

\* I have not examined the tragus of any other species of *Chilonycteris*.

All the specimens maintain a remarkable uniformity in colour and general appearance.

Length of the head and body, about . . . . .	2	0
——— of the head . . . . .	0	10
——— of the ears . . . . .	0	7
——— of the tragus . . . . .	0	2 $\frac{3}{4}$
Breadth of the ears above their outer notch	0	4
Greatest breadth of the tragus . . . . .	0	1 $\frac{3}{4}$
Length of fore-arm . . . . .	2	2
——— of first finger . . . . .	1	9
——— of second finger . . . . .	3	5
——— of third finger . . . . .	2	6
——— of fourth finger . . . . .	2	5 $\frac{1}{2}$
——— of thumb and claws . . . . .	0	3 $\frac{1}{2}$
——— of tibia. . . . .	0	8 $\frac{1}{2}$
——— of foot and claws. . . . .	0	5 $\frac{1}{2}$
——— of <i>os calcis</i> . . . . .	0	10
——— of tail . . . . .	0	9
——— of free end of the tail . . . . .	0	3 $\frac{1}{2}$
——— of the interfemoral membrane . . . .	1	3
Expanse of wings, following the curve of the bones . . . . .	14	0

The above dimensions have been taken from one of the largest specimens; the fore-arm of the smallest is 1 $\frac{1}{2}$ ''' shorter; and as the other dimensions conform pretty accurately to this reduced standard, it will be unnecessary to repeat them.

### 13. NOCTILIO AMERICANUS.

One ex. from Long Hill, St. Elizabeth co.

### 14. MOLOSSUS FUMARIUS, Spix.

*Molossus obscurus*, Geoff.

*M. fuliginosus*, Gray (not Cooper).

I have seen in the museums of Paris and Leyden the specimens of *M. obscurus* of MM. Geoffroy and Temminck, and find them to be identical with the *M. fuliginosus* of the British Museum, and have no doubt that both are referable to the *M. fumarius* of Spix. All the West Indian specimens which I have seen are rather smaller than the South American ones, and for the most part brighter in colour, but at the same time darker.

### 15. NYCTINOMUS NASUTUS, Spix, sp.

*Nyctinomus brasiliensis*, Geoff.

*N. murinus*, Gray.

*Molossus fuliginosus*, Cooper.

*Rhinopoma carolinensis*, Le Conte (not Geoffroy).

As in so many other species, the island specimens of this one are somewhat smaller than those from the mainland. Its geographical





range appears to be very extensive. I have received specimens from many localities in South America, and have compared them with others from Central America, and with the types of *N. brasiliensis* in the Paris Museum, and, again, with specimens of *Molossus fuliginosus* from Charleston, South Carolina, whence they had been sent by Dr. Bachman; and I find them to be all of one species.

This has been supposed by Major Le Conte and others to be the *Rhinopoma carolinensis* of M. Geoffroy; but, having examined the type of this species in the Paris Museum, I am enabled to state that such is not the case. The *Rhinopoma carolinensis* is a small *Molossus* from West Africa and Bourbon (*M. acetabulosus* = *M. natalensis*, Smith); and the *Vespertilio borbonicus*, in the same collection, is a yellowish specimen of the *Vespertilio (Lasiurus) noveboracensis* of the United States! An exchange of labels would render these species intelligible.

4. LIST OF A COLLECTION OF BIRDS MADE BY THE LATE MR. W. OSBURN IN JAMAICA, WITH NOTES. BY P. L. SCLATER, M.A., PH.D., SECRETARY TO THE SOCIETY.

(Plate XIV.)

On the departure of Mr. Osburn, the brother of the late Mr. W. Osburn, to America last year, I was entrusted with the care of the collections of Natural History formed by the latter gentleman in Jamaica, and leave was given me to examine their contents. Being now engaged in preparing a Report on the present state of our knowledge of West Indian Vertebrates for the British Association for the Advancement of Science, I have not thought it right in the interests of science, and in vindication of the discoveries made by the late Mr. W. Osburn, to defer the examination of them any longer.

I have accordingly prepared the following list of the species of birds obtained by Mr. Osburn during his sojourn in Jamaica; and Mr. R. F. Tomes, at my request, has kindly undertaken the task of determining the Mammals, and has given the results of his investigations in the paper just read to the meeting.

Mr. W. Osburn, whose untimely death we must all deplore as that of an energetic scientific explorer and most intelligent writer on Natural History, commenced his residence in Jamaica in the beginning of 1858, and stayed there, I believe, until the period of his decease in the spring of 1860. A series of very interesting letters relating to the natural objects observed in that island will be found in 'The Zoologist' for 1859 and 1860, having been communicated to that periodical by Mr. P. H. Gosse, to whom they were addressed.

The most interesting and the only species which appears to be entirely new in Mr. Osburn's collection is a little bird belonging to the American group of Greenlets (*Vireonidæ*), clearly intermediate in characters between *Vireo* and *Vireolanus*, possessing the bill of the latter and the plumage and general structure of the former. This

form, which Mr. Osburn has designated in his MS. "Olive Chat-terer," I propose to dedicate to its discoverer by the name *Laletes osburni*.

Besides this, Mr. Osburn's series embraces examples of six other species not noticed by Mr. Gosse in his admirable work on the birds of the island; and Mr. Osburn may therefore be fairly considered to have added the following eight species to the Jamaican avi-fauna:—

1. *Henicocichla ludoviciana*.
2. *Dendroæca palmarum*.
3. *Laletes osburni*.
4. *Nesopsar nigerrimus*.
5. *Siphonorhis americanus*.
6. *Tringa bonapartii*.
7. *Herodias egretta*.
8. *Nycticorax violaceus*.

1. TURDUS JAMAICENSIS, Gm.: Gosse, B. Jam. p. 142, et Ill. pl. 24.

2. TURDUS AURANTIUS, Gm.—*Merula leucogenys*, Gosse, B. Jam. p. 136, et Ill. no. 23.

3. HENICOCICHLA LUDOVICIANA (Aud.).—*Seiurus ludovicianus*, Baird.

Two ex., from Freeman's Hall, Trelawny (5th Sept. 1859).

This species is not mentioned by Gosse; but I have examples from Jamaica in my own collection from a different source. Mr. Osburn has marked it "*Seiurus noveboracensis*."

4. HENICOCICHLA NOVEBORACENSIS, Gm.: Gosse, p. 151.

One ex. from Savannah la Mar, Westmoreland, 28th Aug. 1858. *Seiurus gossii*, Bp. Consp. p. 306, is founded upon the Jamaican bird, but it does not appear to me different from the continental *H. noveboracensis*.

5. HENICOCICHLA AURICAPILLA (Lin.).—*Seiurus auricapillus*, Gosse, p. 152.

One ex., from Long Hall (March 11th).

6. PARULA AMERICANA (Linn.): Gosse, p. 154.

Two ex., from Mahogany Hall.

7. GEOTHLYPIS TRICHAS (Linn.): Gosse, p. 148.

Three ex., from different localities.

8. MNIOTILTA VARIA (Linn.): Gosse, p. 134.

One ex., Freeman's Hall (January).

9. DENDRÆCA CANADENSIS (Linn.): Gosse, p. 160.

Several examples in full male plumage.

10. *DENDRÆCA PANNOSA* (Gosse).—*Sylvicola pannosa*, Gosse, p. 162.

Mr. Osburn's collection contains one example of this bird, marked "female." I have little doubt that it is, as has been suggested by Prof. Baird (B. Amer. p. 271) the female of *D. canadensis*, but I have not been able to compare it with females of *D. canadensis* from the continent.

11. *DENDRÆCA PHARETRA* (Gosse).—*Sylvicola pharetra*, Gosse, p. 163; Osburn in Zoologist, p. 6660.

Eight examples of this bird are in Mr. Osburn's collection, principally from Freeman's Hall, collected in January, April, and August 1859. I think there can be no doubt about its being a good typical *Dendræca*; and I should place it next to *D. striata*, which it approaches to in colouring more nearly than to any other known species.

The sexes, as determined by Mr. Osburn, are nearly similar; only the female is less striated and more white on the lower surface, and has the vent and upper tail-coverts pale brown. In the male these parts are more of an ashy brown.

12. *DENDRÆCA PETECHIA* (Linn.): Cassin, Proc. Acad. Philad. 1859, p. 376.—*Sylvicola æstiva*, Gosse, p. 157.

Three examples of this bird (which is rightly distinguished by Cassin from the continental *D. æstiva*, and appears to be the true *petechia*) are marked by Mr. Osburn "*Sylvicola eoa*, Gosse." I do not know the latter bird; but if Mr. Gosse's description (p. 157) and figure (Ill. no. 34) are at all accurate, it must be quite a different species. Mr. Osburn's three specimens of *D. petechia* were obtained in the months of April, May, and August. The crown of that killed in May is deep orange-red, of which there are less traces in that killed in April. The specimen obtained in August is in full plumage, but in bad feathering, and apparently in moult.

13. *DENDRÆCA TIGRINA* (Gm.): Baird, B. Amer. p. 286. — *Certhiola maritima*, Gosse, B. Jam. p. 87, et Ill. pl. 17.

Two examples—a male from Long Hill, St. Elizabeth, 12th March, 1832, coming into full plumage, and a female or young bird from Portland, Vere, 12th April, marked *Sylvicola æstiva*.

14. *DENDRÆCA PALMARUM* (Vieill.): Baird, B. Amer. p. 288.

Three examples of this rather scarce Wood-warbler (which is not mentioned by Mr. Gosse) are in Mr. Osburn's series, marked *S. æstiva*. A male, killed April 6th, 1859, shows the red head coming on; and in a second of the same sex, killed in November, the red tinge may be distinguished. The third bird is a female, with the date not given.

15. *DENDRÆCA DISCOLOR* (Vieill.): Gosse, p. 159.

Three ex., obtained in January and August.

16. *SETOPHAGA RUTICILLA* (Linn.): Gosse, p. 164.

Several ex. of both sexes.

17. *PETROCHELIDON FULVA* (Vieill.).—*Hirundo pæciloma*, Gosse, B. Jam. p. 64.

One ex. It is now well known that this insular bird (and not the N. American *H. lunifrons* of Say) is the true *Hirundo fulva* of Vieillot.

18. *PETROCHELIDON EUCHRYSEA* (Gosse): Gosse, p. 68.

Three ex., from Freeman's Hall, Trelawny.

19. *VIREO MODESTUS*, Sclater, P. Z. S. 1860, p. 462. — *Vireo noveboracensis*, Gosse, p. 192. (Pl. XIV. fig. 1.)

Three examples of this bird, from Freeman's Hall and Mahogany Hall, Trelawny, serve to confirm the validity of the species which I have recently separated from *Vireo noveboracensis* of the continent. The sexes appear to be coloured alike. Mr. Gosse states that it is found all the year in Jamaica, "though in diminished numbers in the summer." Mr. Osburn's examples were procured in February, October, and November.

20. *VIREOSYLVA ALTILOQUA* (Vieill.).—*Muscicapa altiloqua*, Vieill. Ois. Am. Sept. i. p. 67; *Vireosylva olivacea*, Gosse, p. 194.

All the *Vireosylviæ* which I have met with from Jamaica and S. Domingo belong to the present species, which I have no doubt is the bird taken by Gosse for *Vireosylva olivacea*, as has already been suggested by Mr. Newton (*Ibis*, 1859, p. 145). Mr. Osburn's specimens were obtained in the months of June, July, and August.

21. *LALETES OSBURNI*, sp. et g. nov. (Pl. XIV. fig. 2.)

*Laletes genus novum* Vireonidarum, inter Vireonem et Vireolanium medium, rostro huic, illi vero coloribus magis affine: rostrum altius, fortius, compressius quam in Vireone et apice magis uncinato, sed brevius quam in Vireolano: alæ modicæ, dimidium caudæ attingentes: remige externo spurio præsentate; quinto longissimo, sed quartum et sextum, inter se æquales, vix superante, secundo brevior quam secundarii: pedes et cauda fere sicut in Vireone, sed pedes majores et robustiores, et tarsi paulo longiores.

Typ. et sp. unica *Laletes osburni*.

*L. olivaceus*, pileo vix olivacescente, subtus dilutior, abdomine præcipue in medio flavicante: rostro plumbeo, pedibus corylinis.

Long. tota 5·7, alæ 2·9, caudæ 2·2, rostri a rictu 0·65, tarsi 0·85 unc. et dec.

*Hab.* In ins. Jamaica.

Mr. Osburn's collection contains four examples of this bird, labelled "Olive Chatterer," and obtained at Freeman's Hall, Trelawny, in the months of January and April 1859. Comparing it with *Vireo*

*flavifrons*, which it exceeds by rather more than half an inch in total length, we find the beak more compressed and Shrike-like, and nearly similar to that of *Vireolanus pulchellus*, only shorter. The wings are much shorter in proportion than in *Vireo flavifrons*, and the first spurious primary is well developed, measuring about three-quarters of an inch from its insertion. The tarsi and feet in *Laetes* are also rather more robust, and the tail slightly longer, than in this *Vireo*.

The following notice of this species is extracted from one of Mr. Osburn's letters in the *Zoologist* (1859, p. 6662).

"A second bird rather abundant in this district, and not included in your list, is a sober-suited olive-coloured little fellow, that keeps pretty much to the higher branches of lofty trees, though I have not unfrequently met with it on less elevated positions. From its strong, compressed, deeply-toothed bill, I was at first inclined to suppose it might belong to Mr. Swainson's extensive genus *Thamnophilus*; but a better acquaintance with its habits and structure has convinced me that it should probably be classed among his *Ampelidæ*, and somewhere near *Pteruthius*, perhaps, though I am unable to refer it satisfactorily to any of his genera. Not to fill up my letter with a detailed description, which I propose forwarding with the specimens, I may add that the head is a grey dubious olive, which becomes greener on the back. The quills and tail smoky-black, with olive edges, and the under parts dingy yellow. But its chief characteristics are the disproportionate size and thickness of the head, which seems only owing to the arrangement of the feathers, for it would not be suspected from the dried skin. I hope to forward an outline taken from a specimen when quite recent. The grey-blue of the beak is singularly in contrast with the prevailing tints of the plumage. The bird is tame and fearless, and, if perching low, may be easily approached, and is another of the lovers of profound solitude in the forest. I shot two in the earlier part of the year, and in the spring two more. They were then more sociable, and not uncommon. They hunt insects, with considerable bustle. It will give an idea of their movements, if I add that on shooting them at great heights I mistook, before firing, one of them for a *Vireosylvia*, and the other for *Sylvicola pharetra*; but I never saw it distinctly catch an insect on the wing. The stomachs contained several large seeds, a plant-bug, elytra of beetles, &c."

22. *PTILOGONYS ARMILLATA* (Vieill.): Gosse, p. 198.

23. *CERTHIOLA FLAVEOLA* (Linn.): Gosse, p. 84.

Several examples.

24. *GLOSSIPTILA RUFICOLLIS*, Sclater, P. Z. S. 1856, p. 269.—*Tanagrella ruficollis*, Gosse, p. 236.

Several ex. of both sexes.

25. *EUPHONIA JAMAICA* (Linn.): Gosse, p. 238.

Several examples.

26. *SPINDALIS NIGRICEPHALA* (Jameson): Sclater, P.Z.S. 1856, p. 230.—*Tanagra zena*, Gosse, p. 231.

A pair of this Tanager.

27. *LOXIGILLA VIOLACEA* (Linn.). — *Pyrrhula violacea*, Gosse, p. 254.

Two ex. of the male sex, and one female “in male attire,” as marked by Mr. Osburn.

28. *LOXIGILLA ANOXANTHA* (Gosse).—*Spermophila anoxantha*, Gosse, B. Jam. p. 247.

Several examples of this bird, which I have often seen in Jamaica collections. It seems to belong to the same little group as the preceding species, having the same sort of bill, though, of course, smaller in size, and perhaps not quite so much incurved. The *anus*, properly so-called, is “brick-red,” as correctly described by Gosse, whereas his specific term would seem to imply that it was yellow.

29. *COTURNICULUS TIXICRUS*, Gosse, B. Jam. p. 242.

Two examples—the first I have seen of this bird, which is certainly a good species, and different from any of its continental representatives. One example was obtained at Freeman’s Hall, in July 1859, and the other in the Santa Cruz mountains, in the previous March.

30. *SYCALIS BRASILIENSIS* (Gm.). — *Crithagra brasiliensis*, Gosse, B. Jam. p. 245.

One ex., a male, in full plumage.

31. *ICTERUS LEUCOPTERYX* (Wagl.): Gosse, p. 226.—*Psarocolius leucopteryx*, Wagl. Syst. Av. sp. 16; *I. personatus*, Temminck.

One example.

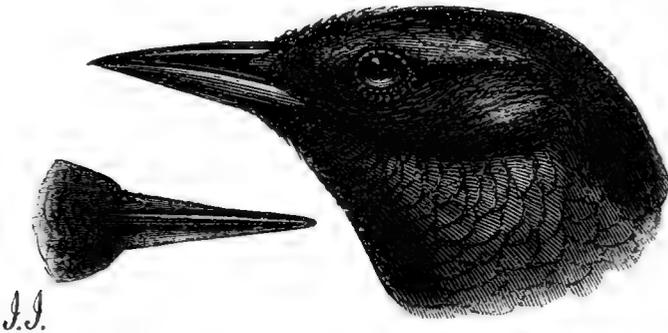
32. *DOLICHONYX ORYZIVORUS* (Linn.): Gosse, p. 229.

One ex., a female, killed in October.

33. *NESOPSAR NIGERRIMUS*, Sclater, Ibis, 1859, p. 456.—*Icterus nigerrimus*, Black Banana Bird, Osburn in Zoologist, pp. 6661 et 6714, et MS.

I shortly described this bird, and gave it a generic name (when noticing Mr. Osburn’s letter about it in ‘The Ibis’), from examples in my own collection. Mr. Osburn’s series contains six specimens of this bird, agreeing with my own. The form must, I think, be placed among the *Quiscalinæ*, not far from *Scolecophagus*, and next to *Lampropsar* of Cabanis. If I am right in my identification of *Lampropsar guianensis*, the two forms are perhaps barely separable generically. The beak (see woodcut) is nearly alike in both; the wings are proportionately rather shorter in *Lampropsar*, but their

general structure is the same; the tail is shorter in *Nesopsar*, and the tarsi are likewise considerably shorter.



Mr. Osburn's six examples of this bird were obtained at Freeman's Hall, as is related in 'The Zoologist' (p. 6661), where the following notice is given of this species:—

"Towards the end of last year, whilst riding through the lower mountains, a perfectly black bird alighted on a wild pine growing at some height, in a vertical position; and as I watched it I observed it climb about the stiff leaves with great agility, and eagerly search their sheathing bases. Your surmise as to the 'Black Banana Bird' instantly occurred to me. I did not then procure it; but the negroes assured me they were abundant higher up, and the investigation was one of the chief objects I proposed to myself on coming here. I did not find them very common, and procured only four specimens during the first six weeks of the year. They are to be met with especially in those deep damp hollows which the forest growth seems striving to conceal, and where orchideous parasites and wild pines luxuriate in abundance. It may there be seen climbing among them, as mentioned above, or flying from tree to tree in short flights; or, if not visible, its very peculiar call is audible far over head. I would imitate it by 'kepchur-r-r-r,'—the first a loud, clear note, followed by a rattle, reproduced with sufficient exactness by a long, rough 'r.' The whole bird is coloured black, and that of the plumage has the purplish gloss of our *Quiscalus*. The hind toe seems rather more developed than in *Icterus leucopteryx*; and it has, I think, a corresponding increase of climbing power, oftener assuming the vertical attitude. One I shot hung head downwards for some time, exactly as the common Banana Bird will do. Another very marked distinction is, that the culmen, or upper ridge of the bill, is flattened and broad, dividing the frontal feathers, like a plate, but does not expand. The following are the dimensions of two specimens; the second was a female, and the first I believe a male, though the part was much injured:—

Length	8 $\frac{1}{4}$ "	Exp.	13.	Flex.	4 $\frac{1}{2}$ .	Tail	2 $\frac{7}{8}$ .
"	7 $\frac{1}{2}$ "	"	12.	"	4.	"	2 $\frac{7}{8}$ .
Rictus	1"	Tarsus	1.	Mid. toe	$\frac{7}{8}$ .		
"	1"	"	1.	"	$\frac{7}{8}$ .		

Hallux  $\frac{6}{8}$ , not, therefore, so long as the tarsus. Intestine 8. The stomachs of all four contained fragments of insects, Coleoptera chiefly; I found no traces of seeds. On the 11th of February the ova of the female were still minute; and in skinning the birds I noticed a rank odour common to many *Corvidæ*. A female was brought to me still alive, and apparently uninjured, except a fracture of the leg. It showed not the slightest pugnacity when handled, and lived several hours. It had not any notion of applying the uninjured foot to a flat surface, but kept it grasped. I put it on a perch. Whether from pain or weakness I do not know; but it immediately slipped round and hung suspended head downwards by its sound foot for some time, and then fell. I do not regard this as a satisfactory proof that the bird habitually rests in this position; but it is not impossible, because, according to the ordinary theory of perching, that in which the weight of the body is brought to bear is, with most birds, the easiest position; whereas this bird made no effort to keep upright, but immediately slid round, as if that were the most available posture for holding on. Of its nidification I have as yet learnt nothing. Should this species prove new to science as well as an addition to our Jamaica list, I would propose '*nigerrimus*' as the specific name, if it is not already appropriated."

34. *ELAINEA COTTA*, Gosse, Ann. Nat. Hist. ser. 2. iii. p. 257 (1849); Ill. B. Jam. pl. 45.

Four examples, in one of which the yellow crown is barely discernible. I have two examples of a second species of this genus from Jamaica, which is, I suppose, undescribed\*. Before I had an opportunity of examining Mr. Osburn's specimens I was inclined to believe the latter were Mr. Gosse's *E. cotta*; but I now find that they are quite different,—*Elainea fallax*, as I propose to call it, belonging to the section of the group with a concealed white crest as in *E. pagana*; whereas *E. cotta* is more nearly allied to *E. placens* of Guatemala, and others, in which the crest is less concealed, and of a bright yellow.

35. *PITANGUS CAUDIFASCIATUS* (D'Orb.): La Sagra, Cuba, pl. 12; Gosse, B. Jam. p. 177.

One example of this bird, which, although abnormal in colouring, appears to be best placed with the *Pitangi*.

36. *MYIARCHUS VALIDUS*, Cab. Orn. Not. ii. p. 351.—*Tyrannula gossii*, Bp. Consp. p. 189.—*Tyrannus crinitus*, Gosse, p. 186, nec Americanorum.

Two ex. of this species.

\* *ELAINEA FALLAX*, sp. nov.

*Obscure olivaceo-viridis, alis caudaque fuscis, hac olivaceo extus limbata, illarum tectricibus et secundariis virescenti-albo extus late marginatis: pileo subcristato interne albo: subtus flavicans, gutture olivaceo induto: rostro obscure corneo, basi albicante: pedibus nigris.*

Long. tota 5·2'', alæ 2·7, caudæ 2·5, tarsi ·75.

*Hab.* In ins. Jamaica.

37. MYIARCHUS STOLIDUS (Gosse).—*Myiobius stolidus*, Gosse, B. Jam. p. 168.

Two ex. of this species, which seems to be best arranged among the smaller *Myiarchi*.

38. BLACICUS PALLIDUS, Cab. Journ. f. Orn. 1855, p. 480.—*Myiobius pallidus*, Gosse, p. 166.

Several ex. of this little species, which is, according to Cabanis, nearly allied to *B. caribæus* of Cuba, the type of this section of *Tyrannidæ*.

39. PLATYPSARIS NIGRA (Gm.).—*Lanius niger*, Gm.—*Pachyrhamphus niger*, Sclater, P. Z. S. 1856, p. 72.—*Tityra leuconotus*, Gray, et Gosse, p. 187.—*Pach. nigrescens*, Cab.

Several examples, in different stages of plumage.

40. CERYLE ALCYON (Linn.) : Gosse, p. 81.

One ex.

41. TODUS VIRIDIS, Linn. : Gosse, p. 72.

One ex.

42. NYCTIBIUS JAMAICENSIS (Linn.) : Gosse, p. 41.

Two ex.

43. CHORDEILES MINOR, Cab. Journ. f. Orn. 1856, p. 5.—*C. gundlachii*, Lawrence, Ann. Lyc. N. Y. vi. p. 165.—*C. virginianus*, Gosse, B. Jam. p. 33.

One example of this *Chordeiles*, obtained in April, which, judging from its dimensions, I must refer to the same species or local variety as that which occurs in Cuba, and has been distinguished by Dr. Cabanis and Mr. Lawrence. Its measurements are, long. tota 7·75", alæ 7·1, caudæ 3·7.

44. SIPHONORHIS AMERICANUS (Linn.).

*Caprimulgus seu Noctua sylvatica jamaicensis minor*, Ray, Syn. Av. et Pisc. (1713).

*Small Wood-Owl*, Sloane, Jam. ii. p. 296.

*Caprimulgus jamaicensis*, Briss. Av. ii. p. 480.

*Caprimulgus americanus*, Linn. S. N. i. p. 346 ; Gm. S. N. ii. p. 1032.

*Siphonorhis genus novum Caprimulgidarum, affine Nyctidromo, sed rostro valde dilatato, apice uncinato, naribus tubularibus et longe eminentibus diversum : alæ modicæ : pedes gressorii, tarsis elongatis, nudis : digiti medii ungue pectinato, cauda rotundata.*

Typ. et sp. un. *Siphonorhis americanus*.

♂. *Fulvo nigroque variegatus, colore capitis cinerascentiore :*

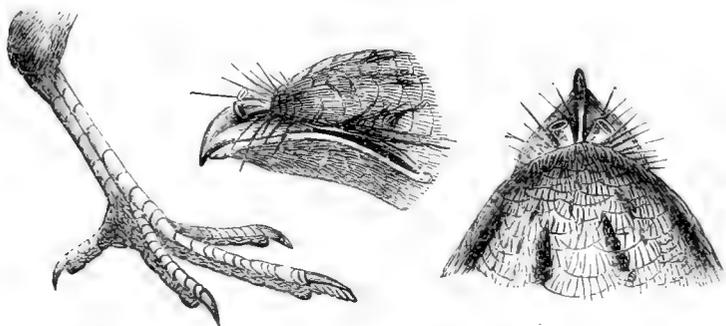
*maculis quibusdam, plumarum scapos occupantibus, in capite elongatis, in dorso magis quadratis, nigris: alis nigris, pallido fulvo extus regulariter ocellatis et intus transvittatis: cauda fulvo nigroque minute variegata, fasciis transversis indistinctis nigris; margine lato apicali, in rectricibus mediis angustiore, albo: subtus dorso similis sed cervice albo torquata, et ventris medii plumis late albo terminatis.*

♀ *torque cervicali et rectricum apicibus fulvescentibus.*

Long. tota 8·75", alæ 5·3, caudæ 4·8, tarsi ·95, digiti med. ·95.

*Hab.* In ins. Jamaica.

Mr. Osburn's collection contains a pair of this very singular Goat-sucker, obtained at Freeman's Hall, Trelawny, in September 1859. The tickets attached to the two birds appear to have been changed, as the white-collared bird, which is evidently the male, is marked "female," and the other, "male." The form, which is quite new to



me, is easily distinguishable from other American *Caprimulgidæ* by its broadened bill, which is almost that of *Nyctibius*, the excessive elongation of the tubular nostrils, and the long naked tarsi (see woodcut). I should be inclined to place it next to *Nyctidromus*, with which it agrees in the latter point; and I have no doubt that its habits, of which unfortunately we have no record, are more or less terrestrial.

That this bird (and not *Nyctidromus derbianus*, as Mr. Cassin\* has attempted to show) is the Jamaican species of Sloane, upon which Linnæus established his *Caprimulgus americanus*, I think there can be little doubt. Mr. Cassin has elaborately discussed the whole subject and comes to this conclusion—"that a species of *Nyctidromus* does inhabit Jamaica, and which is not mentioned by Mr. Gosse, Sloane's figure and description clearly demonstrate." Now, no true *Nyctidromus* is known to inhabit Jamaica; but this aberrant form, which comes nearest to that genus, probably takes its place. It is also especially remarkable for its elevated tubular nostrils—the only character given by Linnæus for the diagnosis of his *Caprimulgus americanus*†, and, as I believe, of itself sufficient to distinguish this peculiar form from every other known Caprimulagine bird.

\* Proc. Acad. Philad. 1851, p. 180 *et seq.*

† "*narium tubulis eminentibus.*"—Linn. S. N. i. p. 316.

45. CHÆTURA ZONARIS (Shaw).—*Acanthylis collaris*, Gosse, B. Jam. p. 51.

Several examples, not differing essentially from continental specimens. I have seen the same bird from S. Domingo.

46. LAMPORNIS PORPHYRURA (Shaw).—*Lampornis mango*, p. 88.

47. POLYTMUS CEPHALATER, Bp. Consp. p. 72.—*Trochilus polytmus*, Gosse, p. 97.

48. COCCYZUS SENICULUS (Linn.): Gosse, p. 281.

One specimen from Savannah la Mar.

49. PIAYA PLUVIALIS (Gm.): Gosse, p. 277.

50. CROTOPHAGA ANI, Linn.: Gosse, p. 282.

Adults and nestlings. The sexes are alike, the sharp keel of the upper mandible being equally developed in both.

51. CENTURUS RADIOLATUS (Wagl.): Gosse, p. 271.

One ex.

52. CONURUS NANUS (Vig.).—*Psittacara nana*, Vig. Zool. Journ. v. p. 273.—*C. flaviventer*, Gosse, p. 263.

Several ex. of both sexes, between which there is no external difference.

53. CHRYSOTIS AGILIS (Linn.): Gosse, p. 266.

Two ex., of which the female, as marked, is rather smaller in dimensions.

54. CHRYSOTIS COLLARIA (Linn.).—*Ps. collarius*, Linn. S. N. p. 149.—*P. leucocephalus*, Gosse, p. 269.—*Pionus vinaceicollis*, Lafr. R. Z. 1846, p. 321.

Two ex., of which that marked female has the white front very narrow. This species, as I have already pointed out, is represented in Cuba by *C. leucocephala*, in S. Domingo by *C. sallæi*, and in Porto Rico by *Chrysotis vittata* (see P. Z. S. 1857, p. 225). When these islands formed one piece of land the region was, no doubt, occupied by a common progenitor, a certain *Chrysotis prisca*, from which these four birds have become modified during their descent.

55. HYPOTRIORCHIS COLUMBARIUS (Linn.): Gosse, p. 17.

56. STRIX PRATINCOLA, Bp.: Gosse, p. 23.

This seems to be more like the N. American *Strix pratincola* than to the Cuban *Strix furcata*, though I should mention that I have not had an opportunity of making an accurate comparison of specimens.

57. *PSEUDOSCOPS GRAMMICUS* (Gosse).—*Ephialtes grammicus*, Gosse, B. Jam. p. 19.—*Otus grammicus* (subgen. *Pseudoscops*), Kaup, Trans. Zool. Soc. iv. p. 231.

One example of this very distinct Owl, the affinities of which seem to be rather with *Otus* than with *Scops*.

58. *PATAGIENAS CARIBÆA* (Linn.): Bp. Consp. ii. p. 54; Gosse, p. 291.

59. *PATAGIENAS LEUCOCEPHALA* (Linn.): Gosse, p. 299.

60. *CHLORÆNAS INORNATA* (Vig.): Bp. Consp. ii. p. 53.—*C. rufina*, Gosse, p. 296.

61. *ZENAIDA LEUCOPTERA* (Linn.): Gosse, p. 304.

62. *ZENAIDA AMABILIS*, Bp.: Gosse, p. 307.

63. *CHAMÆPELIA PASSERINA* (Linn.): Gosse, p. 311.

64. *GEOTRYGON MONTANA* (Linn.): Gosse, p. 320.

Mr. Gosse has forwarded examples of all these seven *Columbidæ*, concerning which I have only to remark that, if the continental form of *Chamæpelis* (usually called *passerina*) is really distinct from the Antillean, it seems to be the latter that should bear the name *passerina*. The Jamaican bird, as Mr. A. Newton has remarked (*Ibis*, 1859, p. 254), is the same as the species which inhabit the Virgin Islands—the *Chamæpelis trochila* of Bonaparte (Consp. ii. p. 77), which name must in this case give place to the Linnean one.

65. *NUMIDA MELEAGRIS* (Linn.): Gosse, p. 325.

Introduced from Africa.

66. *ORTYX VIRGINIANUS* (Linn.): Gosse, p. 328.

Introduced from the United States.

67. *ÆGIALITIS MELODUS* (Ord): Gosse, p. 330.

68. *GALLINAGO WILSONII* (Temm.): Gosse, p. 353.

69. *GAMBETTA MELANOLEUCA* (Gm.): Gosse, p. 352.

70. *RHYACOPHILUS SOLITARIUS* (Wils.): Gosse, p. 350.

71. *TRINGOIDES MACULARIUS* (Linn.): Gosse, p. 349.

72. *TRINGA WILSONI*, Nutt.—*Pelidna pusilla*, Gosse, p. 348.

73. *TRINGA BONAPARTII*, Schleg.

74. *HERODIAS EGRETTE* (Gm.): Baird, p. 666.

Two ex. in Mr. Osburn's collection I refer to this species, which is

not mentioned by Gosse. In the larger the tarsus measures 6·4 inches, in the smaller (marked female) 5·5 inches. The bill is yellow, with a blackish tip to the upper mandible. Mr. Osburn has marked his specimens "*Egretta leuce?*," and has given some interesting notes on its habits under this name in 'The Zoologist' (p. 6932).

75. GARZETTA CANDIDISSIMA, Bp.: Baird, p. 665; Gosse, p. 336; Osburn in Zoologist, p. 6932.

One ex., obtained in Aguatta Vale, Metcalf, Oct. 1859. "Bill black, all but the base, which, like the skin of the front, is bright yellow; tarsi black in front, behind of the same colour as the toes—a greenish yellow."—Osburn, *l. c.*

76. FLORIDA CÆRULEA (Linn.): Baird, p. 671.—*Egretta cærulea* et *E. nivea*, Gosse, pp. 334 et 337; Osburn in Zoologist, pp. 6932, 6933.

Two ex. in adult blue dress, and three in the white dress of immaturity (*Egretta nivea*, Gosse).

77. ARDEA HERODIAS, Linn.: Gosse, p. 346.

78. ARDETTA EXILIS (Gm.): Gosse, p. 343.

79. NYCTICORAX VIOLACEUS (Linn.).

One ex. of this Night-heron.

80. ARAMUS GIGANTEUS (Bp.): Baird, B. N. Am. p. 657.—*Nothorodius holostictus*, Cab. Journ. f. Orn. 1856, p. 426.—*Aramus scolopaceus*, Gosse, p. 355.

One female example agreeing with the Northern form, and distinct from the Southern *A. scolopaceus*.

81. RALLUS CREPITANS (Gm.): Baird, p. 747.—*Rallus longirostris*, Gosse, p. 364.

82. PORZANA CAROLINA (Linn.): Gosse, p. 371.

One ex.

83. PORZANA JAMAICENSIS (Gm.): Gosse, p. 375.

Several ex.

84. CREX MINUTA (Lath.): Gosse, p. 372.

One ex., from "Rosslin Castle."

85. FULICA AMERICANA, Gm.: Gosse, p. 384.

86. GALLINULA GALEATA (Licht.): Gosse, p. 381.

87. PORPHYRIO MARTINICUS (Linn.): Gosse, p. 377.

88. *QUERQUEDULA DISCORS* (Linn.): Gosse, p. 401.

Two ex. I can scarcely believe that Gosse's *Cyanopterus inornatus* is really different from this species; but his specimens should be examined.

89. *SPATULA CLYPEATA* (Linn.): Gosse, p. 408.

One ex., a female obtained in November.

90. *PODILYMBUS PODICEPS* (Linn.): Baird, B. Am. p. 898; Gosse, p. 438.

Three ex., to each of which is attached a paper containing a mass of feathers "taken out of the pyloric cavity."

91. *PODICEPS DOMINICUS* (Linn.): Gosse, p. 400.

One ex.

92. *STERNA REGIA*, Gambel: Baird, B. N. Am. p. 858.—*Thalasseus cayanus*, Gosse, p. 431.

One ex., obtained in March, with wing-feathers in moult.

5. ON SOME POINTS RELATING TO THE HABITS AND ANATOMY OF THE OCEANIC AND OF THE FRESHWATER DUCKS, AND ALSO OF THE HARE (*LEPUS TIMIDUS*) AND OF THE RABBIT (*L. CUNICULUS*), IN RELATION TO THE QUESTION OF HYBRIDISM. BY EDWARDS CRISP, M.D., F.Z.S., ETC.

This communication was suggested by the exhibition at our last meeting, by Mr. Bartlett, of four hybrid ducks between the Summer Duck (*A. sponsa*) of North America, the Pochard (*Fuligula ferina*), and the Ferruginous Duck (*Fuligula nyroca*). Mr. Bartlett thought that the progeny of these hybrids would be prolific. In the discussion which followed concerning these birds, I expressed my belief that the hybrid between the hare and the rabbit was a much more remarkable occurrence, taking the habits and the anatomy of the animals into account, than that of a cross between an oceanic and a freshwater duck. From this opinion several of the members dissented.

It will now be my object to make a fair investigation of this matter; and as the question of hybridism is one becoming daily of greater importance, I think that our time will not be unprofitably occupied, more especially as the comparisons I am about to institute will, I think, furnish some matters of physiological interest.

And first, of the Ducks; and I speak chiefly of British ducks. In this family of birds there is, for the most part, a great general resemblance, whether we look to their habits or to their anatomy. They have been divided into the Oceanic and Freshwater ducks; but it must be observed that they both frequent the sea, and also the freshwater rivers, although the first-named ducks are more limited to the ocean,

to which their structural peculiarities render them better adapted. Their flesh, as regards flavour, has the same character, although modified somewhat by the nature of the food. In the sexual \* differences of colour (excepting the genus *Tadorna*) there is a great general resemblance; and the same may be said, as far as we know, of the period of incubation. The eggs, comparatively speaking, both as regards number and appearance, are very uniform. Their nidification, too, including the abstraction of down from the body of the female, is nearly of the same kind; and the nature of their food, both animal and vegetable, is very similar. Of animal food the oceanic and diving ducks obtain a greater variety, including univalve and bivalve shells; but some of the freshwater ducks (so called), as the Shoveller (*Anas clypeata*), obtain a large quantity of these, as I have verified in several instances by dissection.

If we look to their internal organization, we have here likewise a great general resemblance. The lungs, heart, gullet, gizzard, intestines and their appendices—the pancreas, spleen, kidneys, and oil-glands—have nearly all the same character.

I have placed on the table the sterna of twenty-two different species of ducks, and likewise the tracheæ of nearly all the species of our British ducks; and it will be seen that, with the exception of the Common Scoter (*Anas nigra*) and the Surf Scoter (*A. perspicillata*), the lower part of the air-tube is furnished with a bony enlargement, more or less complete in the different species of oceanic ducks, and affording in these a greater variation as to form: thus, in the King Duck (*A. spectabilis*) and in the Eider (*A. mollissima*) this protuberance is without membranous divisions, as in the freshwater ducks; and the same may be said of the Velvet Scoter (*A. fusca*); but the enlargement in the air-tube of this bird is seated some distance above the bronchi.

In Yarrell's 'British Birds,' vol. iii. pp. 148, 202, descriptions are given of the freshwater and oceanic ducks. The characteristics of the former are said to be length of neck and wings, round tarsi, unlobated and free hind toe. "In habits they may be stated generally as frequenting fresh water, but passing much of their time on land, feeding in ditches and about the shallow margins of pools, on aquatic plants, insects, worms, and occasionally on small fish, taking their food at or near the surface, possessing great powers of flight, but seldom diving unless pursued. Of their internal parts, the stomach is in the greatest degree muscular, forming a true gizzard; the intestines long; the cæcal appendages from 6 to 9 inches in length in the larger birds, and decreasing only in proportion to the size of the species. Of the bones it may be observed that the ribs are short, the angle formed by the union of the first pair on each side extending but little beyond the line of the posterior edge of the sternum; the keel of the breast-bone is deep, affording great extent of surface for the attachment of large and powerful pectoral muscles; the enlargement at the bottom of the trachea in all of them is of

\* I do not speak of the changes of plumage in the oceanic ducks, because we have yet much to learn respecting this matter.

bone only. The males of this species are further remarkable for becoming for a time during summer more or less like the females," &c.

At page 202, in speaking of the oceanic ducks, their food is said to be "fish, shelled mollusca, crustacea, and marine insects, but little or no vegetable production. Their powers of flight moderate, and their walk embarrassed, from the backward position of their legs. Of their soft parts, the œsophagus is capable of great dilation; the stomach is a muscular gizzard, but the internal cavity is large, and the sides comparatively thin. The ribs are elongated, and the keel of the breast-bone decreases in depth in those species which in their habits most resemble the *Merganser*."

In the above account there are several inaccuracies. Thus, the gizzard in many of the diving ducks, taking the weight of the bird into consideration, is quite as muscular as in the freshwater ducks; indeed the nature of their food requires this provision. I have not found either the above-mentioned difference in the œsophagus or in the length of the alimentary canal and appendices. The oceanic ducks, moreover, take a large amount of vegetable food; and the proportional size of the pectoral muscles in many of them is quite as great as in the freshwater ducks. The keel of the sternum, too, in some, is as deep; indeed the sterna of two of the ducks in question (the Summer Duck and the Ferruginous) bear in every respect a great resemblance; but to bring this matter to a more practical bearing, let me take eight ducks that I have recently dissected (four oceanic and four freshwater), by way of comparison of the length of the intestinal tubes. The appendices are included in the length of the canal.

Name.	Weight.	Length of alimentary canal.		Length of appendices.
		ft.	in.	in.
Scaup ( <i>Anas marila</i> ) .....	27	7	9	13
Golden-eye ( <i>A. clangula</i> ) .....	31	5	8	10
Pochard ( <i>A. ferina</i> ) .....	37	5	0	4
Common Scoter ( <i>A. nigra</i> ) .....	38½	6	0	1½
Shoveller ( <i>A. clypeata</i> ).....	20	5	7	6
Pintail ( <i>A. acuta</i> ) .....	36	5	3	12
Wild Duck ( <i>A. boschas</i> ) .....	42	7	2	10
Garganey Teal ( <i>A. querquedula</i> ) .....	13	5	8	3½

In twenty skeletons of different species of ducks that I have lately examined, I find that all have fourteen cervical vertebræ, seven caudal, and nine pairs of ribs, with the exception of the Summer Duck (*Anas sponsa*) and the *Anas cæruleata*: these have only eight ribs; but I scarcely need say that more than one specimen must be examined to ascertain whether this is the normal number.

Time will not allow me to touch upon the minor differences, external and internal, which apply more or less to all families of birds. Speaking generally, the short, thick-set, rounded form of the oceanic duck, its short wings and neck, shorter and flatter tarsi, lobated

hind toe, more elastic breast-feathers, and the greater quantity \* of grey down upon the skin, will serve at once to distinguish it. Internally the form of the lower part of the air-tube in the male, the wider and shorter sternum, in many instances with a less developed keel, and the form of the pelvis, are for the most part sufficiently characteristic; but they are none of them, I think, as regards the question at issue, of special importance.

One of my objects has been to point out some of the errors (as I believe) that generally prevail respecting portions of the anatomy of the oceanic ducks, and to show that several of the distinctions made are not well-founded. In my concluding paper † “On the Presence or Absence of Air in the Bones of Birds,” I hope to exhibit other differences, not before recorded, respecting the absence of air in the *humeri*, and the muscular arrangement of the air-cells in some of the Sea-ducks (so called).

But lastly, as to the inquiry whether these hybrid ducks between the Summer Duck, the Pochard, and the Ferruginous Duck are likely to breed together as suggested by Mr. Bartlett, I have no hesitation, looking to their anatomy, in which there is a great general resemblance, to answer the question in the affirmative; but whether the progeny of these hybrids will also be prolific, is a matter that time only can determine.

I now come to the more interesting part of my subject, viz. that of the *Leporines*—hybrids, so called, between the hare and the rabbit. It has been stated that M. Rouy, of Angoulême, has bred for the market a thousand of these *Leporides* yearly—that they are fertile both with the hare and the rabbit, and with each other. I have written to M. Rouy, but up to the present time I have received no answer. It is reported that the cross is effected by keeping the animals together when very young. In the Society’s Collection there are now several of these *Leporines*, and two of them have litters of young; but whether they are of the first cross it is difficult to determine. The adult animals have a hare-like character; they are large, weighing about 5 lbs., with long ears and long hind legs; but this description will equally apply to some varieties of the rabbit. I have, however, carefully examined the fur (microscopically and otherwise); and about the hare-like character of this *I think there cannot be a question*. The hair is long, and has the same party-coloured appearance (black and fawn) as in the hare—a peculiarity that I have not seen in any variety of the rabbit. The disinclination of the male for copulation is another feature very unlike the character of the rabbit. Of the two females mentioned, one has five young ones, and the other two: of the former litter two are black; of the latter both are grey: they are born blind, are wild, and, unlike the tame rabbit, shriek when handled. The female makes her nest of down, and covers her young. Mr. Bartlett has kindly given me one of his young Lepo-

\* The Summer Duck (*A. sponsa*) has as complete a covering of grey down as any of the oceanic ducks that I have examined, and in this respect it differs from all the British freshwater ducks that have come under my notice.

† See P. Z. S. 1857, pp. 9, 215.

rines, about three and a half months old, for examination. It was bred between the male Leporine from Paris and a common black rabbit. It weighed 3 lbs. 11 oz. Its fur and most of its external characters partook chiefly of those of the rabbit; and the same may be said of its visceral anatomy: the trachea, lungs, and heart are comparatively small; the length of the alimentary canal 17 feet  $6\frac{1}{2}$  inches. The flesh was white, and in flavour like that of the rabbit.

With the above I have examined two hares and two wild rabbits, male and female, and I have weighed ten adult specimens of each; the average weight of the hares was 6 lbs. 11 oz., that of the rabbits 3 lbs.  $\frac{1}{2}$  oz. By way of comparison I have taken a hare weighing 7 lbs. and a rabbit weighing 3 lbs. 5 oz. I have measured and weighed every part of importance, but I need only mention some of the comparisons:—Brain of hare 210 grains, eye 75 grains, lungs 684 grains, heart (bloodless) 655 grains, trachea very large, length of alimentary canal 18 feet. Brain of rabbit 125 grains, eye 35 grains, lungs 193 grains, heart (bloodless) 119 grains, trachea very small, alimentary canal 15 feet 1 inch. I may remark here that I have sometimes found the intestinal tube in the hare (probably in young specimens) much shorter than that before mentioned. I have compared the spermatozoa, the blood-corpuscles, and the various viscera not mentioned above, and I find no important difference in them.

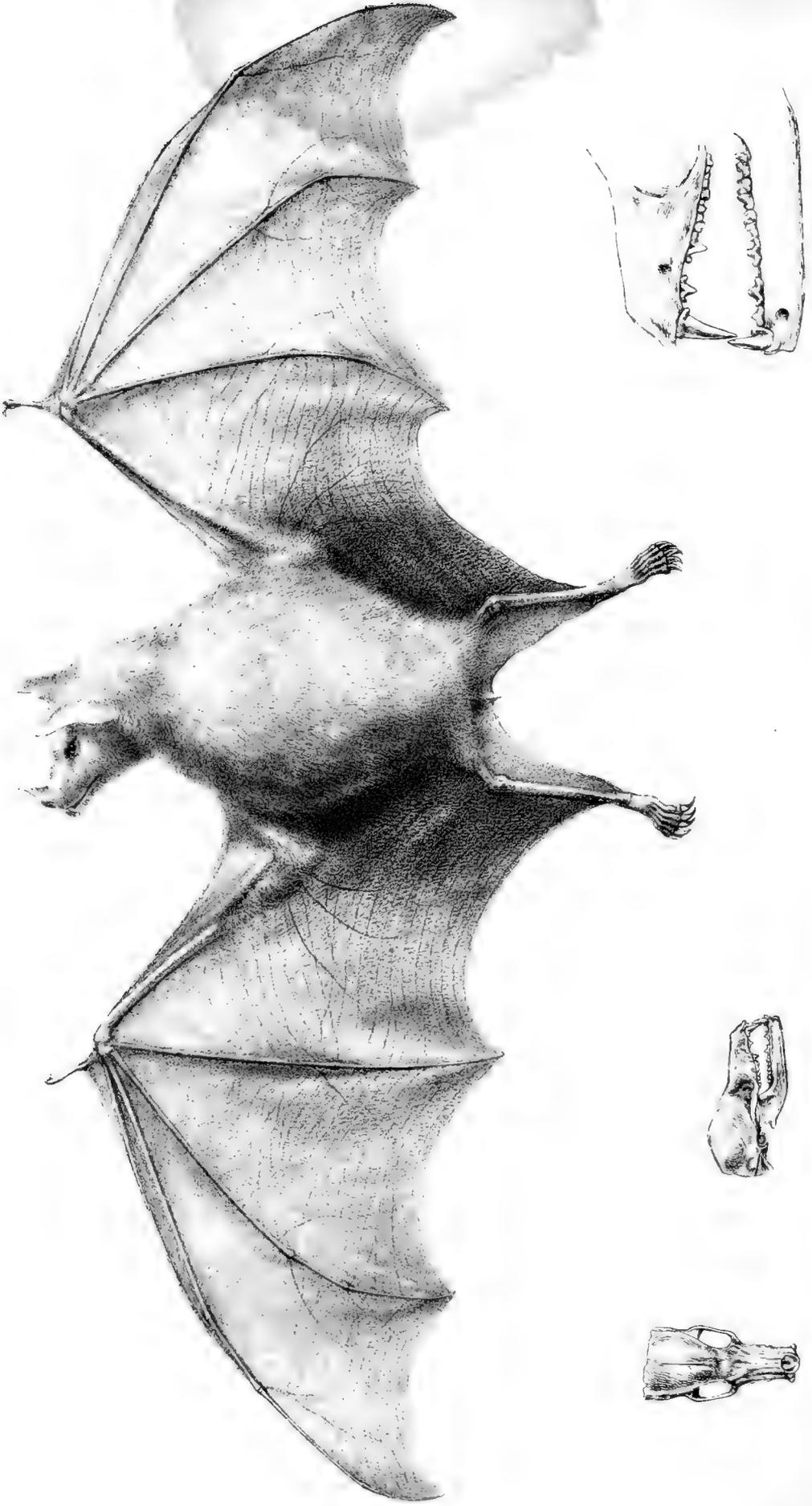
As regards the skeleton, I have been unable to discover any appreciable difference, except in its size and in the length of the hind extremities; but in the Museum of the College of Surgeons there is a skeleton of the Lop-eared Rabbit (Preparation 1949); and if the posterior limbs are compared with those of the hare (Prep. 1914), the resemblance will be found to be very great.

In taking a retrospect of the anatomy of these animals we find a great similarity; the interesting and important differences are in the *heart, lungs, and trachea*. These I pointed out in 1854, in a paper read before the London Physiological Society, "*On the Weight, Form, Size of the Cavities, and Thickness of the Parietes of the Heart in the Vertebrate Animals*.\*" On referring to the weights of the above-named organs, it will be seen that the proportions are *very remarkable*. Thus, the heart of the hare (and I speak from the examination of many specimens) is nearly five times the weight of that of the rabbit; the lungs are nearly four times as heavy; and the calibre of the trachea three or four times as great; the rings of the air-tube are about the same number in both.

But it must be remembered that these are differences in *degree*, and not in *kind*, and may be explained to some extent by the habits of the animal. The comparative swiftness and durability of speed of the hare require a larger and stronger circulating organ; and the same remark will apply to the respiratory apparatus. If, however, we have this similarity of structure, in many respects (as is well known) the habits of the animals are widely different. The period of gestation in the hare is said to be a month, that of the *wild* rabbit three weeks; but I am not acquainted with any reliable evidence

\* Lancet, 1854.





MONOPHYLLUS REDMANII.

G. H. Ford.

W. West. del.

upon this subject. The young of the rabbit are naked and blind; whilst those of the hare see, and have a hairy covering at birth; the number of young in the hare is from two to four, that of the rabbit from four to seven (early in the spring I have generally found four). The rabbit burrows, takes down from its body, covers its young and leaves them at night; whilst the hare (English) seldom, unless hard pressed, will go to earth. Without pointing out minor differences, I have said enough to lead some to suppose that my first impression was correct, viz. that the cross between the hare and the rabbit was a more extraordinary one than that between the ducks in question. But a closer investigation leads me at once to acknowledge my error; for, looking especially to the comparative anatomy, and believing, as I do, that time and circumstances may produce essential alterations in the habits and in the external form, colour, and size of animals, I think that there are more unstable and far-fetched theories in physiology than the belief that the hare and the rabbit may have been originally one and the same animal.

---

March 12th, 1861.

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

Dr. P. L. Sclater exhibited a very fine and perfect example of *Pentacrinus caput-medusæ*, which had been placed in his hands by Lieut.-Col. P. C. Cavan, F.Z.S. This specimen had been dredged up in 60 fathoms' water on the coast of S. Lucia, West Indies, by a fisherman, whose lines had become entangled in it.

Dr. Crisp exhibited drawings of two fishes from a salt-water lagoon near Cape Coast Castle, West Africa.

The following papers were read:—

I. ON THE GENUS MONOPHYLLUS OF LEACH.  
BY ROBERT F. TOMES, CORR. MEMB.

(Plate XV.)

*Glossophaga*, Geoff. Mém. du Mus. t. 4. p. 411, 1818.

*Monophyllus*, Leach, Linn. Trans. xiii. p. 73, 1820.

*Nicon*, Gray?, P. Z. S. 1847, p. 15.

Having recently examined a collection of Bats from Jamaica, collected by the late Mr. Osburn, and containing several specimens of a Leaf-nosed Bat which, on comparison with the mutilated type of Leach's genus *Monophyllus*, proves to be identical with it, I have thought that a more detailed description taken from these specimens

might be useful, as it is pretty evident that the one from which Leach drew up his description was imperfect. I may here observe that, when referring to the allied species of Bats, *Glossophaga amplexicaudata* and *G. ecaudata*, for the purpose of comparison, I allude to specimens in my own collection, which by actual comparison have been proved to be identical with the type-specimens in the Paris Museum.

In general form the species which I am about to describe may be said to be intermediate between *Glossophaga amplexicaudata* and *G. ecaudata*, but rather more strongly built than either, the bones of the wings and legs being stouter, and the head relatively somewhat larger.

The top of the head is considerably elevated above the facial line, it is of a rounded form, and is scarcely half of the entire length of the head; the muzzle long, compressed, and pointed. The nose-leaf differs in no important respect from that of the allied species already alluded to; it is short, and tapers evenly to a somewhat acute point. It is sparingly suffused with very short hairs, visible only with the assistance of a lens. At its base, in front, is a naked depression of an inverted triangular form, the turned-up base of which forms the bottom of the nose-leaf; whilst from the turned-down summit of the triangle a vertical groove passes, which divides the upper lip in half. In this depression the nostrils are placed, in shape like a comma, and having a very oblique position, their larger ends being downwards and inwards, thus  $\epsilon \ \rho^*$ . The lower lip has a triangular naked space in front, down which passes a vertical notch, which is continued down the middle of the chin for the distance of about a line.

The ears are shaped very much like those of *G. ecaudata*, being a little emarginate exteriorly, but they are somewhat larger than in that species; the tragus is small, about one-fourth the length of the ear, its two sides are nearly straight (a little convex, however), and its end evenly rounded. On its outer edge is a pointed process, which is about one-third of the distance from its base.

The wings are proportioned much as in *G. ecaudata* and *G. amplexicaudata*; but the thumb is much longer and stronger than in either of those species, and the claw more hooked. Its basal phalange is short, being scarcely more than half the length of the penultimate one; whilst the terminal one is short, but bears a claw which is long, strong, compressed, much curved, and pointed. As a consequence of the shortness of the basal phalange of the thumb, the antibrachial membrane is very narrow at, and near, the carpus.

The interfemoral membrane is narrow, intermediate between that of *G. amplexicaudata* and that of *G. ecaudata*; its hinder margin presents a semicircular form when the femora are drawn up into a horizontal position; but when the legs are extended, it is deeply emarginate. The tail is short, and has its terminal half produced beyond the edge of the membrane, to the upper surface of which it

\* It is requisite that a dried specimen should be softened in order that the shape of the nostrils may be clearly seen.

is attached rather than included in it, as it is in *Vespertilio*. The *os calcis* is rudimentary.

The feet are much stronger than those of *G. amplexicaudata*, and fully equal in actual size to those of *G. ecaudata*, which is a larger species; they are therefore *relatively* larger than in that species. The claws are long, strong, and hooked.

All the face is suffused with very short hairs, of the same quality as those of the head; on the lips and nose-leaf they are so short as to be almost invisible without the aid of a lens; but, with the exception of the triangular space containing the nostrils, and the front part of the under lip, no part can properly be said to be quite naked. The ears, however, are naked, saving a small portion of their outer surface, which is quite at their root. The fur of the under parts extends a little on to the humerus and the membrane near it, and to a trifling extent on to the proximate end of the fore-arm; but everywhere else the membranes are naked.

The cranium is of a very elongated form, which is due in great measure to the great length of its facial part. In general appearance it resembles that of *G. amplexicaudata*; and it will be necessary only to state in what respect it differs from that of the latter species. In *G. amplexicaudata* the skull is perfectly devoid of ridges or crests; but in *Monophyllus* two ridges from the supra-orbital processes pass inwards and backwards, much as in *Phyllostoma hastatum*, and, meeting in the centre of the space between the orbits, unite to form a sagittal crest, which is not, however, very prominent, and does not extend to the occipital suture. The hinder margin of the palate (which extends far back in these allied species) is much more deeply and narrowly emarginate in *Monophyllus* than in the other species compared with it. The inferior margin of the lower jaw of *Monophyllus* presents a difference from the same part in *G. amplexicaudata*, which is as follows:—In the latter species this margin curves off quite evenly to the posterior angle or process, which is acute, equally prominent with the condyle, and directed obliquely upward in precisely the same degree. In *Monophyllus* the lower margin of the jaw is most convex just opposite to the anterior root of the coronoid process; and behind this is a shallow indentation, which is increased by the posterior process taking a somewhat downward direction, the extreme point, however, being recurved.

But the teeth of this species present a striking dissimilarity from those of the other *Glossophagine* Bats with which they have been compared. Although in number they correspond with those of *G. amplexicaudata*, in form and in position they have but little resemblance to them. The upper incisors are four in number; they are of a very simple form, being somewhat flattened, with their sides parallel; the inner ones are the largest,—the outer ones being minute and more rounded than the others, appearing to be little more than two rounded tubercles. They are separated from each other, and from the canines on either side, by intervals which are fully equal to the breadth of the teeth themselves. The canines are long, pointed, and angular, and are destitute of a cingulum, but have a well-marked

rounded process at the base in a line with the incisors, and another one in a line with the premolars. The first premolar has an interval on each side of it; it is of considerable size, very much compressed, and has three well-marked cusps, of which the middle one is long and acute, the other two being equally pointed, but very short. The second premolar is placed in proximity to the molars; it has somewhat the form of the first, excepting that the hinder accessory cusp is less distinct. The true molars, when viewed directly upon their crowns, exhibit a considerable development of their inner posterior angle, which may be said to project into the palate. Otherwise these teeth are feebly developed, and have the W-shaped crowns which usually characterize the insectivorous species very imperfectly defined. The outer anterior cusp is somewhat produced, and has a forward direction, which is most distinctly visible externally.

The lower incisors in some specimens examined were found to be wholly absent; in others, part of them only had been lost; whilst in a few instances all were retained, and were as follows:— In number they correspond to those of the upper jaw; they are of rudimentary form and size, being mere rounded tubercles, and the inner ones very minute; they are placed far apart, especially the two inner ones, between which is a space which appears wide enough to allow the tongue to pass between them. The canines are thin and long, with an internal cingulum. The first premolar is very much compressed, and has a single cusp, which forms an obtuse angle when seen laterally, and presents a thin edge when seen longitudinally; near to its hinder part is a slight indentation, or indication of a separation into a posterior lobe or cusp. This tooth is almost in contact with the canine, and with the second premolar, which is not shaped like the first in the lower jaw, but like the first one in the upper jaw; that is, it has three cusps. Succeeding to this tooth is an interval, which is followed by the third premolar, shaped like the second, and in contact with the true molars. These latter are compressed, and have five pointed cusps, four of which form an irregular longitudinal row, and the fifth is placed outside of the posterior one of the four.

The following will explain the number, and in some measure the position, of the teeth of this species:—

$$\text{Inc. } \frac{1-1-1}{1-1-1}; \text{ Can. } \frac{1-1}{1-1}; \text{ Premol. } \frac{1-1-1-1}{1-1-1-1-1-1}; \text{ Mol. } \frac{3-3}{3-3} = \frac{16}{18} = 34.$$

Under the name of *Phyllophora*, Dr. Gray has separated such species of M. Geoffroy's genus *Glossophaga*, as have the tail and interfemoral membrane developed as in *G. amplexicaudata*\*; whilst such as are without tail he has denominated *Anoura*, of which *G. ecaudata* is the type. A third genus has been adopted by Dr. Gray, which is typified by the species I have been describing, the name originally given by Dr. Leach being retained. Without adverting

\* I do not know at present how *Nicon* differs from *Phyllophora*. There appears to be considerable obscurity about the genera of this group of Bats, which has been occasioned in great measure by the bad state of Leach's specimen of *Monophyllus*.

to the tailless group, which I have not sufficiently examined, I wish to take the present opportunity of stating that I have examined more than one species of the group *Phyllophora*, and find that in some details of structure of the cranium, and in the number, position, and form of the teeth, they are similar. Should any differences appear in the cranium and teeth of the tailless species, we shall have at least three well-marked groups (probably of subgeneric rank) amongst these allied forms, with perhaps the addition of a fourth in the genus *Ichnoglossa* of M. de Saussure.

Assuming that *Monophyllus* possesses characters which are something more than merely specific, the following description, of a purely specific kind, in addition to the details already stated, will render this communication more complete, and indeed include all our present knowledge of the group.

MONOPHYLLUS REDMANII. (Pl. XV.)

*Monophyllus redmanii*, Leach, Linn. Trans. xiii. 73, 1820.

*Glossophaga caudifer*?, Geoff. Mém. du Mus. t. 4. p. 411, 1818.

*Nicon leachii*?, Gray, P. Z. S. 1847, p. 15.

The fur on all parts of the body is of medium length, thick, soft, and a little glossy. All the upper parts are of a uniform greyish-brown, with the extreme tips of the hairs slightly hoary; the top of the head is a little paler than the back. On all the under surface the fur is bicolor, dusky-grey at the root for more than half its length, and tipped with greyish white, which is a little silvery in appearance. The whole of the cutaneous system is dark brown.

	in.	lin.
Length of the head and body, about . . . . .	2	2
— of the head . . . . .	0	10½
— of the ears . . . . .	0	4
— of the tragus . . . . .	0	1¾
— of the nose-leaf . . . . .	0	1¾
Breadth of the nose-leaf at its base. . . . .	0	1½
Length of the fore-arm . . . . .	1	7
— of the first finger . . . . .	1	3
— of the second . . . . .	3	2
— of the third. . . . .	2	4
— of the fourth . . . . .	2	1
— of the thumb and claw . . . . .	0	5½
— of the tail . . . . .	0	4½
— of the free part of the tail . . . . .	0	2
— of the tibia . . . . .	0	7¼
— of the foot and claws . . . . .	0	6
Expanse of wings, following the bones of the arm, and longest finger . . . . .	12	0
Length of the skull from the front margin of the intermaxillary bones to the posterior root of the zygoma . . . . .	0	7½

	in.	lin.
Breadth across the zygomatic arches . . . . .	0	5
Length of the nasal bones . . . . .	0	3½
——— of the palate, to its posterior notch . . . .	0	5½
——— of the dental series, from the front of the upper canine to the posterior molar, inclusive	0	4
Breadth of the palate between the canines. . . . .	0	1½
——— of the palate between the posterior molars	0	2
Length of the lower jaw, from the posterior pro- cess to the front of the <i>symphysis menti</i> . . . . .	0	7½
Depth vertically from the coronoid process . . . .	0	2
Length of the dental series, from the front of the lower canines to the hinder cusp of the last molar . . . . .	0	4

2. DESCRIPTION OF A NEW SQUIRREL, IN THE BRITISH MUSEUM, FROM NEW GRANADA. BY DR. JOHN EDWARD GRAY, F.R.S., V.P.Z.S.

(Plate XVI.)

Mr. Edward Gerrard lately brought to me a Squirrel that he had not been able to identify with any other specimen in the Collection, or with any of the American species lately described, and which he was convinced was distinct from any of the American Squirrels of about the same size in the Museum by the peculiar form of its skull.

I have therefore drawn up a short description of the species, and named it after my assistant, who has done so much to extend the osteological collection in the Museum, and who is so ready to impart his extensive knowledge of Vertebrate animals and their osteological structure to any one who may desire to profit by it.

SCIURUS GERRARDI. (Pl. XVI.)

Blackish: hairs brown, with black tips, with a broad subapical orange ring; cheeks yellowish-brown; fore part of the back, sides of the neck and body, shoulders, and outer side of the fore legs, and front of the hinder legs bright-red bay; feet pale bay; base of the tail blackish, with the hairs slightly varied with pale orange rings; middle of the tail bright bay, end black; throat from under the eyes, inside of the fore legs, chest, and belly pure white; ears blackish, with very short scattered hairs.

*Hab.* New Granada. British Museum.

Size and form of the European Squirrel, but the tail longer and the ears not pencilled. The skull is very different from that of *Sc. langsdorffi*, being small and more lengthened.

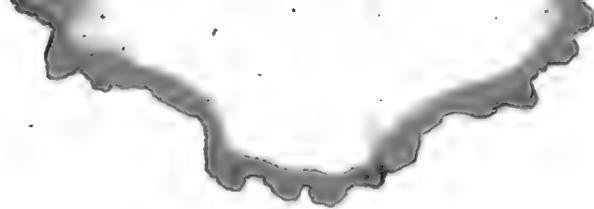
The newly born young specimen is coloured precisely like the adult; but the tail is slender, rather depressed, but nearly cylindrical, covered with elongate close-pressed hair.

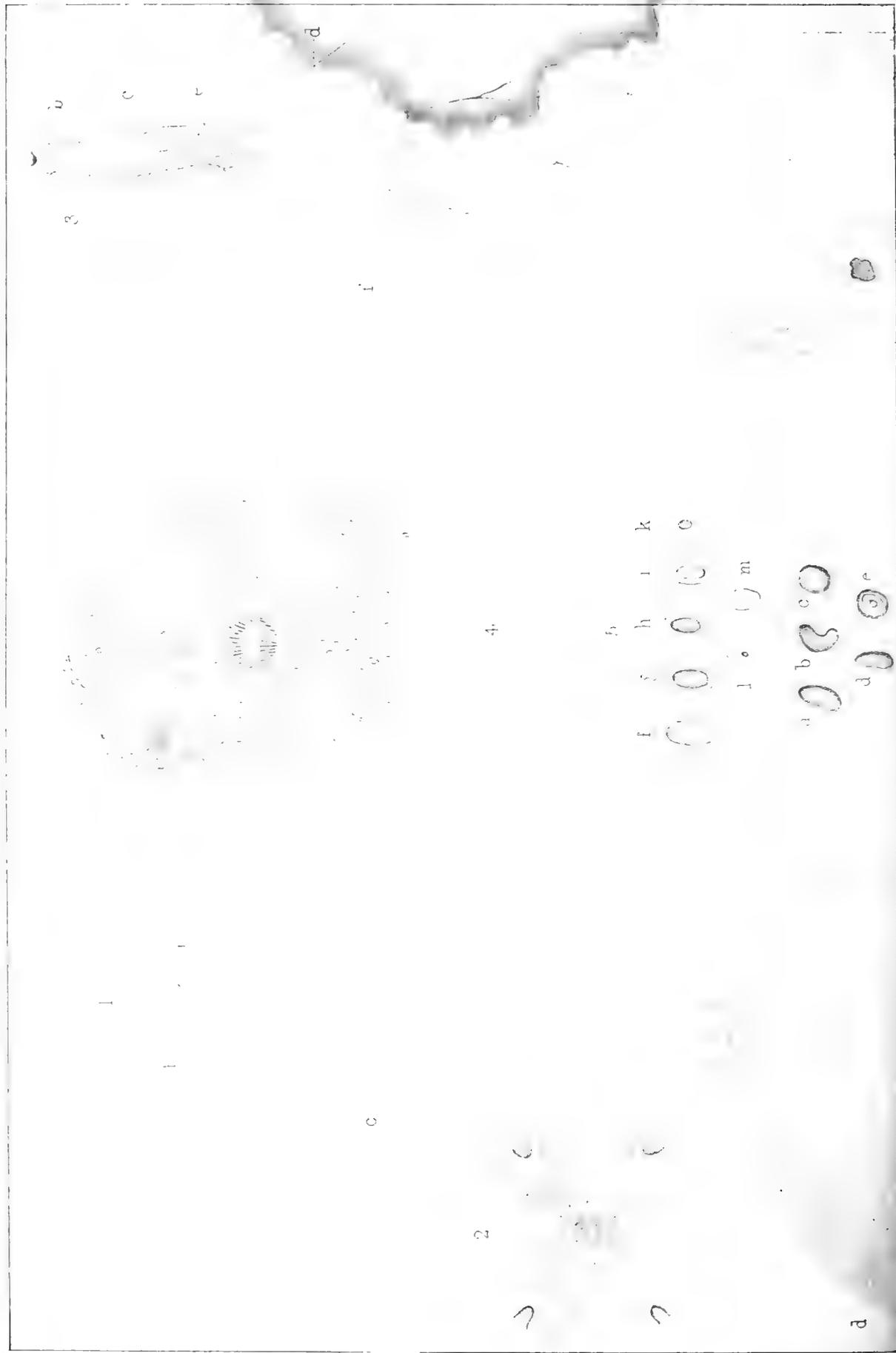


J Wolf del.

V. S. Hart sculp.







### 3. ON CYSTIC ENTOZOA FROM THE WART-HOG AND RED RIVER-HOG. BY T. SPENCER COBBOLD, M.D., F.L.S.

(Plate XVII.)

Although it is now no longer doubted by those who have paid special attention to the genetic relations subsisting between the cystic and cestoid Entozoa, that the former are immature conditions of the latter, yet sufficient interest attaches itself to the structure of obscure and otherwise interesting larval forms, to induce me to lay before the Society the accompanying observations.

From the abdomen of the female Wart Hog (*Phacochærus æthiopicus*) which died in the Society's Menagerie on the 16th Dec. 1859, and was dissected by Dr. Crisp, Mr. Bartlett, myself, and others on the 19th of the same month, I obtained a solitary Cysticercus. This immature cestoid was enclosed in a thick fibrous cyst situated near the region of the cæcum, its size, over all, being rather larger than a cricket ball. On removing the Cysticercus from its fibrous investment—the latter having been accidentally ruptured during the process of evisceration—it was found to consist of the following well-marked parts, which may be respectively recognized as the head, neck, body, and caudal vesicle (Pl. XVII. fig. 1). The head (*a*) is quite visible to the naked eye, and when viewed from above, by the aid of reflected light under a low magnifying power, displays an oblong quadrangular outline, the corners being rounded off by the presence of four prominent sucking disks. At the centre there is a projecting rostellum marked by a circle of radiating lines, such as would indicate the existence of a double row of cephalic hooks. These holdfasts (if I may so term them) were not, however, actually present; but had in all probability fallen off during the degeneration and calcification of the head, which was quite hard and brittle, and under pressure crumbled up into an amorphous granular mass. The head was easily detached from the neck, the calcified suckers retaining their globular form as perfectly as is represented by fig. 2. That part which I have termed the neck (*b*) is cornucopial in form, and exhibits well-defined transverse striæ, which become rather more distinct towards its base. The body (*c*) is clavate, elongated, comparatively thick at its anterior third, and narrow at the lowermost part, where it is in connexion with the large circular caudal vesicle. The body and the vesicle (*d*) are each  $3\frac{1}{2}$  inches in length, the greatest breadth of the former being 1 inch, while that of the latter has a transversal measurement equal to its longitude; they are both hollow, and when removed were partly filled with a pale-yellow transparent fluid; they do not intercommunicate, yet both exhibit externally the before-mentioned transverse striæ.

From the female Red River Hog (*Potamochoærus penicillatus*), which died at the Society's Gardens on the 12th of November, 1860, I obtained on the 16th of the same month five examples of a Cysticercus. In the Society's male Red River Hog, which died last February, no Entozoa of any kind were detected. One of the cystic worms just mentioned occupied a cyst in the liver, the other four

being attached to the mesenteric folds of the peritoneum. All five bear a close resemblance to one another, but they differ very materially from the *Cysticercus* infesting the Æthiopian Wart Hog. Those attached to the mesentery were also encysted; but in these instances the envelope appeared to be merely a production of the peritoneal membrane itself, and not an abnormal product, such as had clearly resulted from inflammatory action, both in the case of the liver-cyst and in the fibrous capsule of *Cysticercus ex Phacochoæro æthiopico*. The *Cysticerci* of the Red River Hog, when withdrawn from their enveloping membranes, exhibited a more or less oval or elliptic outline, as may be seen in the example selected for illustration (fig. 3). This drawing shows only the neck (*b*), body (*c*), and enormously developed caudal vesicle (*d*). The head, being inverted and enclosed within the upper part of the neck, could only be found after a prolonged dissection and unfolding of the parts. When this was done, and the head placed under an inch objective, it was found to display the usual four sucking disks, and a double coronet of hooks, as represented in the accompanying illustration (fig. 4). The margin of the neck is bordered by a double contour, the parenchymatous substance being everywhere studded with a multitude of calcareous corpuscles, which are not limited to the neck itself, but are also present in the head. To these bodies I shall again have occasion to allude, whilst I revert in the mean time to the body and caudal vesicle of our *Cysticercus*. The former is about half an inch long, and somewhat distended by the presence of soft, irregular bundles of tissue in its interior. This tissue occurs in the form of shreds or rope-like coils (*e*, fig. 3), which become finely attenuated below, and depend loosely into the cavity of the caudal vesicle. Histologically, they merely consist of a fine granular matter, and therefore they are not referable to any specialized structure or set of organs. Neither the body nor the vesicle exhibits the transverse striæ seen in the *Cysticercus* from the Wart Hog; but, in addition to a few irregular surface-foldings, the lining membrane of the vesicle gives off here and there some extremely delicate thread-like filaments (*f*), having the same structural character as those bundles of granular parenchyma found within the body. A little circular spot marks their origin; and from this they hang floating in the fluid contents of the vesicle.

I have investigated the so-called calcareous corpuscles of this *Scolex* or *Cysticercus ex Potamochoæro penicillato* with very great care; but I did not detect any of them within the walls of the caudal vesicle. They are extraordinarily abundant within the head and neck, and by their highly refracting properties impart to the tissues, when viewed by transmitted light, a dark pigment-like hue, almost obliterating the limiting membranes of the inverted head. They are more numerous than I have indicated in the accompanying drawing (fig. 4), but their relative disposition and size are accurately represented. Their form is commonly that of spherical, or oval, flattened disks (fig. 5 *f*, *c*, *e*); but not unfrequently they are elongated, occasionally thicker at one end than the other (*a*, *d*), and sometimes reniform (*b*). All are bordered by an opaque margin; and they often

display evidences of concentric lamination, the rings resembling nuclei and nucleoli (*e*). In respect of size, they do not, for the most part at least, vary materially; they have an average length of  $\frac{1}{1400}$  to  $\frac{1}{1000}$ th, and a breadth of from  $\frac{1}{2000}$  to  $\frac{1}{1400}$ th of an inch. On the addition of diluted sulphuric acid, a rapid effervescence took place, accompanied with the total destruction of the corpuscles; whereas the alkaline reagent liquor potassæ caused only a gradual dissolution of the enveloping membrane, leaving behind a perfectly transparent and thin calcareous plate, unpossessed of any appreciable light-refracting properties. The last-mentioned change proceeded uniformly from without inwards; the corpuscle marked *f* (fig. 5) presenting at intervals appearances precisely like those indicated at *g*, *h*, *i*, *k*, *l*, and *m*; the last is the isolated calcareous plate, whose circumferential border has lost that entire smooth outline which the unaltered corpuscle invariably exhibits.

I have not detected any appearance of subdermal pouches, such as those discovered and described by me elsewhere as occurring in the immature *Tricuspidaria nodulosa*\*; but I have carefully noted the foregoing particulars because the definitive solution of several interesting questions depends upon a correct appreciation of the relative structure, chemical constitution, and disposition of the calcareous corpuscles as observed in the various groups of Entozoa in which they are known to abound.

From recent investigations, and more especially from those of Claparède, I think we may inferentially draw the following conclusions:—

These bodies cannot be regarded in the light of pathological products, as Moulinie and others suppose; and it is still more obvious that Tschudi, Gulliver, Goeze, and Zeder were wrong in describing them as eggs. Eschricht, and the late Prof. William Smith of Cork, clearly erred in attributing to them a special nutritive function when the former spoke of them as “elementary granules” having a function analogous to that of the blood- and lymph-corpuscles, and the latter described them as “assimilating cellules.” Prof. Van Beneden is probably also as incorrect in viewing them as cutaneous glands “secreting a mucus destined to lubricate the surface of the body.”

To offer a true explanation of their character and purpose is still, however, a matter of great difficulty; for there seems to be no doubt that in some instances, especially in mature cestodes and in certain trematodes, the presence of carbonate of lime is contra-indicated. The circumstance also of Claparède’s having discovered these bodies to be included within dilatations or cæcal pouches connected with the excretory system of *Holostomata*, considered in association with the fact that I have myself found them lodged in peculiar oviform sacs in *Tricuspidaria* (*Triænoporus*), would likewise seem to forbid our acceptance of Von Siebold’s notion, that the bodies in question are comparable with the “spicules and calcareous networks” strengthening the integument of Echinoderms. Neither can I, in

\* Quart. Journ. of Microscopical Science, vol. vii. pp. 115, 202.

this view, subscribe to Prof. Huxley's opinion, that they are homologically identical with the thread-cells of the hydroid polyps\*.

In the first of my serial papers on Entozoa, communicated to the Linnean Society (Dec. 3rd, 1857), I proposed the term "sclerous particle" as preferable to that of "calcareous corpuscle," for reasons which are sufficiently obvious; but I cannot even now pretend to offer a satisfactory solution of the problem concerning the true nature of these bodies. Whatever physiological or morphological signification they possess, I cannot but regard the oviform sacs in which they occur as specialized structures formed for their secretion and development.

I also abstain from hazarding any opinion as to the species of Cestode to which the above-described Scolex-forms or Cysticerci are referable; yet that the latter are merely larval conditions of *Tæniæ*, is an inductive truth which no entozoologist would now for a moment dispute.

#### EXPLANATION OF PLATE XVII.

- Fig. 1. Head (*a*), neck (*b*), body (*c*), and part of the circular caudal vesicle (*d*) of *Cysticercus ex Phacochæro æthiopico*. Natural size.
- Fig. 2. Enlarged view of the head of the same.
- Fig. 3. Section of *Cysticercus ex Potamochæro penicillato*, showing the neck (*b*), body (*c*), caudal vesicle (*d*), coils of granular parenchyma (*e*), and filament (*f*) of the same character.
- Fig. 4. Upper part of the neck unfolded and magnified 60 times, to show the inverted head *in situ*: it also exhibits the four suckers, the double crown of hooks, and the so-called calcareous corpuscles.
- Fig. 5. Isolated calcareous corpuscles, to show their forms and the changes undergone by the addition of an alkaline reagent.  $\times 220$  diameters.

#### 4. DESCRIPTION OF ASTERONYX LOVENI, MÜLL. ET TROSCH., A NEW BRITISH STARFISH. BY JOHN A. STEWART, NEW COLLEGE, EDINBURGH.

This fine Starfish belongs to the *Euryalææ*. It is the second species of this division of the *Ophiuridæ* which has been noticed in the British seas; and it is the more interesting as it is a form intermediate between the already known species (*Astrophyton scutatum*, Link) and the simple-rayed *Ophiuræ*, having the prehensile scaleless arms, and the radiating body-ribs of the other *Euryalææ*, joined with the undivided arms of the *Ophiuræ*. As in *Astrophyton*, it wants the mouth-plates between the origin of the rays, but has instead a strong calcareous bar uniting the bases of the two neighbouring arms. The two genera have also the madreporiform tubercle on the *under* surface in one of the interbrachial angles nearest the mouth. The genus *Trichaster* is generally placed between *Astrophyton* and *Asteronyx*, but it has the interbrachial mouth-plates, and wants the madreporiform tubercle; indeed it seems scarcely separable from *Ophiocolax*, except in possessing prehensile divided arms, and would per-

\* See his elaborate Memoir on *Echinococcus*, in the Society's Proceedings for Dec. 14th, 1852.

haps be more correctly placed by the side of this genus among the true *Ophiuræ*.

The specimen now exhibited was found in Loch Torridon in Ross-shire, in the summer of 1859. I took it from the deep-sea lines which had been set in a part of the loch 9 fathoms deep, and having a rocky bottom. Koren records this species as occurring on the coasts of Norway at a depth of from 50 to 150 fathoms (Nyt Magazin für Naturvidenskaberne, vol. ix. p. 96).

The specimen from which Müller and Troschel's description was taken is in the Museum at Stockholm. It was found at Bohuslän, near Hammerfest, Norway.

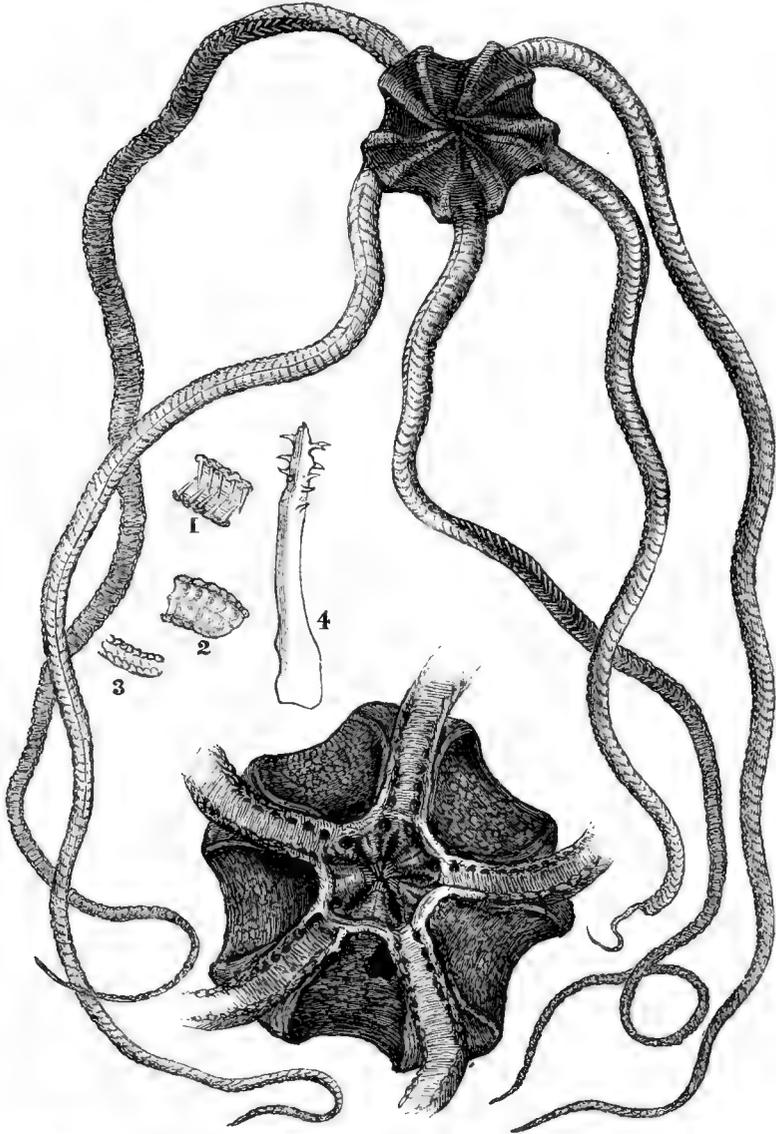
*Description of Asteronyx loveni, Müll. & Trosch.*

The body is pentangular. The skin, which covers the body and arms, is naked, without scales or granules. On the upper surface of the body, covered by the skin, are ten radiating ribs in subparallel pairs; they rise from the margin of the body, on either side of the arms, and, passing inwards, unite, leaving a small central portion of the disk free; they are cartilaginous and flat, with a slight depressed central groove: very much reduced in size, they are continued on the under surface of the body, along the margin of the arms, to the genital openings.

The mouth is five-radiate, and placed in the centre of the under-surface of the disc, in the midst of the origin of the arms; a strong osseous bar, taking the place of the interbrachial plate of the *Ophiuræ*, unites the bases of the arms, and forms a solid ring round the mouth; the five bars give origin to as many calcareous cones, which passing inwards nearly meet in the centre; the intervening spaces form the five-radiate mouth. Articulated to the cones are a number of spines, which increase in number and length towards the apex; behind the base of the cone, in the angle of each interbrachial space, is placed two genital openings; the madreporiform tubercle also occupies the angle of one of these spaces.

The arms are convex above, and quite flat on the under surface; they are composed of narrow calcareous joints, each of which is furnished with appendages on the inferior angles; on the second joint from the base of the arm a single short spine appears on either side; before the arm leaves the disk, the number increases to three or four, the one on the inner side being longer than the others; these spines are articulated to calcareous processes, with socket depressions for the insertion of the ball-joint of the spines; the processes are scarcely visible at first, but increase in size, until, beyond the middle of the arm, their margin supplies space for the attachment of no fewer than twelve very short spines. The inner spine gradually increases in length from the base of the arm until it reaches its maximum about 2 inches from the disk; soon thereafter it begins to decrease, and continues until it becomes of the same size as the others. This long slender spine is directed inwards on the flat under-side of the arm, and reaches at its greatest length fully two-thirds

across; it is covered on its summit with a number of recurved spikelets. The second spine is slightly compressed towards the summit, where, on its inner margin, it is furnished with a few spikelets



in a single series. When the animal is alive, a thin membrane covers the whole of the spines, as in other Echinodermata; but in dried specimens this is scarcely discernible.

Two series of tentacle-pores run along the sides of the arms—one pore to each joint, placed near to and in a line with the spines. They can be easily traced for 2 inches or so along the length of the arm; but whether they continue much further it is difficult to say from the dried specimen. Two of these pores occur at the origin of the arms within the calcareous ring surrounding the mouth.

The breadth of the body is  $1\frac{5}{8}$  inch. The most perfect arm in the specimen is 12 inches long; but as this has been twice, perhaps more frequently, broken and repaired, it is probable that its true length would be at least 2 inches more. The relation of the body to the arms is thus as 1 to 9.

In the accompanying drawing (see woodcut, p. 98) the whole animal is represented at about half the natural size, and the upper surface of the disk at the size of life. Fig. 1 shows the under surface of a ray about 2 inches from the disk; fig. 2 the upper surface of the same ray; fig. 3 the under surface, towards the extremity of the ray; and fig. 4 one of the large inner spines magnified.

##### 5. ON AN UNDESCRIBED SPECIES OF BRITISH ZOANTHUS. BY E. W. H. HOLDSWORTH, F.L.S., ETC.

In August 1860 I received from Mr. T. H. Stewart, of the Royal College of Surgeons, a *Zoanthus* which had been taken by him a few days previously whilst dredging for Echinoderms in Plymouth Sound. After a careful examination of the specimen, I am induced to regard it as specifically distinct from *Z. couchii*, to which species, of the three found on our coasts, it is most nearly allied. As the polypes were unfortunately dead, and beginning to decay when they came into my possession, they were at once immersed in spirit; and their characters were noted whilst in that condition.

The specimen consists of an unattached group of ten polypes, of



various ages, ranging from a simple bud to individuals an inch in length. They are all united at the base, which is rounded below, and encloses a small sandy nucleus, particles of the same material being also aggregated on the surface from which the polypes spring,

and between their points of union. This radiating mode of development is the same as in some of the free varieties of *Z. couchii*, and will doubtless bear a similar explanation. The largest polypes are nearly a quarter of an inch in diameter at the head, and taper slightly downwards. This form, however, is most apparent in half-grown examples. The dermal coating consists of fine siliceous sand, as in *Z. couchii*; but the marginal serrations are not nearly so conspicuous as in that species, and indeed require a careful scrutiny, under dissection, to distinguish them at all. The colour of the tentacles, as observed by Mr. Stewart at the time of capture, was a distinct red; and after some days' immersion in spirit, the tint was still perceptible through the integument surrounding the head, where the sand is less densely impacted than in other parts of the surface. The distinctions between these polypes and those of *Z. couchii*, so far as I am now able to judge, consist in the colour of the tentacles, the comparative absence of the serrated margin, and especially in

the great length of the body in the new species,—a character, I believe, of considerable importance; for, although *Z. couchii* is extremely liable to variation in the development of the basal membrane, and in the size of the polypes, the proportion of length to breadth is tolerably constant. Large specimens quite equal the present species in breadth; but their length is barely half what we here find, even in the contracted state, and in this instance it would be increased under expansion by at least a quarter of an inch. The variation to which many of our marine polypes are subject should at all times make us cautious in admitting new species; but I think the above characters will justify me in making the addition in the present case.

This specimen was dredged in 20 fathoms, on a bottom of sand, pebbles, and broken shells, and did not afterwards sufficiently expand to allow more than the decided colour of the tentacles to be made out. This unusual colour in a British species induces me to propose for it the specific title of *rubricornis*.

6. ON A NEW GENUS AND SPECIES OF PARRAKEET FROM WESTERN AUSTRALIA. BY JOHN GOULD, F.R.S.

*GEOPSITTACUS OCCIDENTALIS*, Gould.

All the upper surface grass-green, each feather crossed by irregular bands of black and greenish yellow; feathers of the crown and nape with a streak of black down the centre; throat and breast yellowish-green, passing into sulphur-yellow on the abdomen; spurious wings brown; primaries and secondaries brown, narrowly fringed with a greenish hue on their external webs, with the exception of the first three; the primaries and secondaries have also an oblique mark of yellow near their bases, which mark increases in breadth and in depth of colour as the feathers approach the body; two centre tail-feathers dark brown, toothed on the edge of both webs with greenish-yellow; the next on each side dark brown, toothed on the other web only with brighter and longer marks of yellow; the remainder dark brown, crossed by bands of yellow, which in some cases are continuous across both webs, and in others alternate; under tail-coverts sulphur-yellow, crossed on their outer webs with narrow oblique and irregular bands of blackish-brown; bill horn; feet fleshy.

Total length 10 inches, bill  $\frac{1}{2}$ , wing  $5\frac{1}{2}$ , tail 5, tarsi  $\frac{7}{8}$ .

*Hab.* Western Australia.

*Remark.*—At a first glance this bird has the appearance of a *Pezoporus formosus* with an undeveloped tail; but on a careful comparison it is found not only to differ from that species in some parts of its colouring, but also in form—sufficiently so, indeed, to warrant the opinion that it will be necessary to make it the type of a new genus. Its whole contour and colour reminds one of *Strigops*. The points in which it differs from *Pezoporus* are the possession of a thick bluff head, larger and more swollen nostrils, the total absence of any red mark on the forehead, a much larger wing with more rounded primaries, a very short tail the two centre feathers of which

are much shorter than the two next on each side, and, lastly, in having very differently formed feet, with short and feeble nails, whereas in *Pezoporus* they are prolonged and slender.

For this new bird I propose the generic name of *Geopsittacus*, with that of *occidentalis* as its specific designation.

The following additions were announced to have been made to the Menagerie, by gift and purchase, during the months of January and February:—

## JANUARY.

		Presented by
1 Wart Hog from Ashantee	<i>Phacochoerus alicani</i> ...	Her Majesty the Queen.
1 Macaque Monkey .....	<i>Macacus cynomolgus</i> ...	P. Thompson, Esq.
1 Broad-tailed Sheep .....	<i>Ovis aries</i> , var. ....	} H. E. Sir George Grey.
1 Cape Hyrax .....	<i>Hyrax capensis</i> .....	
2 Wedge-tailed Eagles.....	<i>Aquila fucosa</i> .....	Dr. Müller.
1 Australian Water-Tortoise	<i>Chelodina longicollis</i> ...	P. Joske, Esq.
2 Common Otters.....	<i>Lutra vulgaris</i> .....	The Marquis of Bath.
1 Gazelle .....	<i>Gazella</i> — ?.....	R. Colyar, Esq.
1 Long-eared Owl.....	<i>Otus vulgaris</i> .....	J. G. Barclay, Esq.
1 Rhesus Monkey.....	<i>Macacus rhesus</i> .....	— Shepherd, Esq.
2 Canadian Porcupines.....	<i>Erethizon dorsatum</i> ...	Major Boyd.
1 American Peregrine .....	<i>Falco anatum</i> .....	Capt. Spencer.
1 Douroucouli Monkey ...	<i>Nyctipithecus trivirgatus</i> .	} Purchased.
1 Female Llama .....	<i>Auchenia glama</i> .....	
1 South American Monkey	<i>Cebus</i> — ? .....	

## FEBRUARY.

		Presented by
1 Common Stork .....	<i>Ciconia alba</i> .....	G. Hough, Esq.
1 Ocelot.....	<i>Felis pardalis</i> (?).....	— Young, Esq.
1 Javan Deer .....	<i>Moschus kanchil</i> .....	Bryan M'Cartley, Esq.
1 pair of Yaks .....	<i>Bos grunniens</i> .....	C. M. Robison, Esq.
9 Australian Quails .....	<i>Synæcus australis</i> .....	Dr. Müller.
1 Australian Fish .....	<i>Galaxias scribea</i> .....	Mr. W. A. Lloyd.
1 Vervet Monkey .....	<i>Cercopithecus delalandii</i>	— Tyler, Esq.
1 Long-eared Owl.....	<i>Otus vulgaris</i> .....	} Purchased.
2 Brent Geese .....	<i>Bernicla brenta</i> .....	
1 pair of Hybrid Ducks {	<i>Anas boschas</i> ? .....	
	<i>Mareca penelope</i> ? .....	} Purchased.
2 Bustards.....	<i>Otis tarda</i> .....	
2 Australian Doves .....	<i>Calænas</i> — ? .....	} Purchased.
3 Indian Bats .....	<i>Pteropus edwardsi</i> .....	
1 Patas Monkey .....	<i>Cercopithecus ruber</i> ...	
2 Black-tailed Parrots .....	<i>Psittacus timneh</i> .....	
1 Chinese Blue Jay .....	<i>Urocissa sinensis</i> .....	

Of these, *Phacochoerus alicani*, *Chelodina longicollis*, *Synæcus australis*, *Galaxias scribea*, and *Urocissa sinensis* were stated to have been received for the first time.

March 26th, 1861.

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

Mr. Tegetmeier brought before the Meeting living specimens illustrating an undescribed abnormal variation of plumage in the *Gallus domesticus*.

The alterations previously noticed were the assumption of the male plumage by the females. These changes, which are dependent on diseased or abortive ovaries, were described by Mr. Yarrell in the 'Philosophical Transactions' for 1827.

The specimen brought before the meeting illustrated the assumption of the female plumage by the adult male. A cock, of the variety known as the Brown-breasted Red Game, was hatched in the spring of 1859, and assumed the perfect male plumage in the autumn of that year; in the autumnal moult of 1860 it shed the male plumage and became perfectly hen-feathered, not only as to the colour of the plumage, but also in the form of the feathers. This remarkable variation was attended by a slight increase in size and muscular development; the spurs were well-grown and remarkably sharp, the crow remained unchanged, and the bird retained its procreative power, with an increased amount of combativeness.

The alteration was stated to be not unknown to those who breed game fowls for the purpose of cock-fighting, the birds being termed "hen-cocks," and remarkable for their courage and endurance in the cock-pit. The engraved portrait of a celebrated victor was exhibited.

Mr. Tegetmeier stated that he was not aware how far the disposition to undergo this change was hereditary, but that he was putting it to the test of experiment. A young cock hatched in 1860 from the hen-feathered male before it had undergone the change, was shown in perfect masculine plumage.

In the Sebright or Laced Bantams (a variety originating with Sir John Sebright, whose mode of producing it was never published) the males are hen-feathered, but the condition is congenital; whereas in the bird exhibited the change took place in the second year, and the circumstances that determined the alteration were altogether unknown.

The following papers were read:—

1. OBSERVATIONS ON THE GENUS VAMPYRUS, AND ITS ALLIES.  
BY ROBERT F. TOMES, CORR. MEMB.

(Plate XVIII.)

Amongst the numerous species of Chiroptera which passed under notice when preparing the various papers which have appeared in the 'Proceedings' of this Society, was one which, from its considerable





size and remarkable appearance, very soon attracted my attention. Although I failed completely in finding any published description which would apply to it, yet I could not but think it extraordinary that such a fine species should have so long escaped observation; and this idea was heightened by the fact that several specimens had come to hand which had not been received from private collectors, but, on the contrary, from dealers.

Being at length fully aware that no sufficient description could have appeared, I drew up a full account of the species, and placed specimens in the hands of Mr. Ford, for the purpose of adding figures of the animal and of the teeth. A figure had scarcely been completed, when a very elaborate description appeared from the pen of Dr. Peters, accompanied by a beautifully executed plate, of a species of *Vampyrus*, having the appropriate name of *Vampyrus auritus*, which, at first sight, was evidently the species I had so often observed.

During the investigations gone into when working out the affinities of this species, several others, more or less closely allied, were examined, and some careful notes were made; and these, it appears to me, will not be out of place now. I will first give an outline of what may be termed the history of the nomenclature of these species, more or less closely allied to *Vampyrus*.

The name of *Vampyrus* is mentioned by M. Geoffroy St.-Hilaire so long ago as 1810, in his paper on the *Phyllostomidæ* in the 'Annals of the Museum,' but is only there alluded to as having been applied by Linnæus to the large frugivorous Bats in a vague manner, and as having been made use of by Buffon when speaking of the Bat M. Geoffroy was then describing, viz. *Phyllostoma spectrum*. But the name appears to have been merely intended at this time to designate such species as were supposed to be guilty of sanguivorous propensities; and in Dr. Leach's paper in the Linnean 'Transactions,' we have its first real application in a proper generic sense. In this paper, which bears date 1820, we find *Vampyrus* applied to the *Phyllostoma spectrum* of M. Geoffroy's paper.

In 1823 the large work of Dr. Spix, on the Brazilian Monkeys and Bats, appeared, in which the distinction between the genera *Phyllostoma* and *Vampyrus* was recognized, and three species placed in the latter genus, all of which were distinct from the *V. spectrum*. More than twenty years later (in 1847), M. D'Orbigny, in the part of his work, 'Voyage dans l'Amérique méridionale,' devoted to Mammalia, described and figured a Leaf-nosed Bat under the generic name of *Lophostoma*; and in the same year Dr. Gray published, in the 'Proceedings' of the Zoological Society, the definitions of two new genera of *Phyllostomidæ*, which received respectively the names of *Mimon* and *Trachops*, furnished by species called by Dr. Gray *Phyllostoma bennettii* and *Trachops fuliginosus*.

Finally, M. Gervais, so recently as 1855, in his account of the Chiroptera collected in South America by M. de Castelnau, characterizes, as the representatives of three new genera, three species which had been previously described,—the first and second being the *Vam-*

*pyrus soricinus*\* and *V. bidens* of Spix, representing respectively the genera *Hemiderma* and *Tylostoma*, and the third a small species which had been previously described by Dr. Gray under the name of *Phyllostoma elongatum* †, supplying the type for the genus *Schizostoma*.

These proposed genera, seven in number, are represented by about eight species; and as I have compared the greater part of them with each other (all save the *Lophostoma sylvicolum*), I am enabled to give the following analysis of the group. I may premise, however, that I do not assent to all these subdivisions, and bring them forward more to show what has been done, than with any view to their adoption.

### Genus VAMPYRUS, Geoffroy et Leach.

#### A. (*Vampyrus*, Leach.)

General form robust; cutaneous system ample. Wings short, broad and rounded; hinder limbs somewhat elongated; interfemoral membrane ample. *Tail absent*. Wing-membranes extending to the base of the toes. Ears large and ovoid; tragus small and pointed. Nose-leaf simple and pointed, its margin free all round, the anterior or horse-shoe part not divided from the posterior or elevated part. Lower lip with a reflex front, which is divided in half by a vertical cleft.

Dentition.—Incisors  $\frac{4}{4}$ ; premolars  $\frac{2-2}{3-3}$ .

First upper premolar smaller than the second, not compressed.

First and second lower premolars equal in size, not compressed, and smaller than the third.

#### EX. VAMPYRUS SPECTRUM.

#### B. (*Vampyrus*, subgen. *Lophostoma*, Peters.)

General form as in *Vampyrus spectrum*, but the hinder limbs much shorter. Wings very broad, short and rounded. Ears very large, and regularly oval. Wing-membranes extending to the roots of the toes; interfemoral membrane ample. Tail as in *Phyllostoma hastatum*.

Dentition.—Incisors  $\frac{4}{2}$ ; premolars  $\frac{2-2}{3-3}$ .

First upper premolar much smaller than the second, not compressed.

First lower one much larger than the second, which is very small, rounded, and placed inside the line of the other teeth, so as to be invisible outwardly.

#### EX. VAMPYRUS AURITUS, Peters. (Pl. XVIII.)

*Lophostoma sylvicolum* of the Leyden Museum.

\* This species is supposed by Dr. Gray to be the same as the *Phyllostoma brevicaudum* of Pr. Max. *Hemiderma*, Gerv., is identical with *Carollia*, Gray.

† This is quite distinct from the *Phyllostoma elongatum* of M. Geoffroy.

C. (*Schizostoma*, Gervais.)

General form, as well as nose-leaf and ears, as in *Vampyrus auritus*, but the wing-membranes merely extending to the extremity of the tibia.

Dentition.—Incisors  $\frac{4}{4}$ ; premolars  $\frac{2-2}{3-3}$ .

First upper premolar smaller than the second, somewhat compressed.

First lower one larger than the second, and rather compressed, second and third of nearly equal size.

Ex. PHYLLOSTOMA ELONGATUM, Gray, Voy. Sulph. Mamm. pt. 1. p. 19. pl. 8, 1843 (not *P. elongatum* of Geoffroy).

*Schizostoma minutum*, Gerv. Voy. Casteln. Mam. p. 49. pl. 7 et 10, 1855.

*Phyllostoma scrobiculatum*, Wagn. Supp. Schreb. v. 627, 1855.

Obs. I have compared examples of this Bat collected during the travels of M. de Castelnau with the original of Dr. Gray's *Phyllostoma elongatum* in the British Museum, and find them identical. M. Gervais says, "M. Westphal-Castelnau nous en a remis un exemplaire de la province de Bahia. Celui-ci a ventre gris-brun, comme tout le reste du corps." This describes the original specimen pretty accurately, and agrees very well with the plate given by Dr. Gray, which seems to have been overlooked by M. Gervais. A considerable number of similarly coloured specimens have been received from M. Sallé, collected in Oaxaca, Mexico. The removal of this species from the genus *Phyllostoma* renders needless the specific name of *scrobiculatum* given to it by M. Wagner, as, with the generic name of *Vampyrus*, it need not be confounded with the *Phyllostoma elongatum* of Geoffroy.

Its generic qualifications appear to be those of *Vampyrus spectrum*, with the addition of a tail, with much shorter hind limbs, and wing-membranes which do not extend beyond the distal extremity of the tibia. It differs, too (and the difference indicates a more typical form), in having the second premolar, in the lower jaw, much smaller than the first.

D. (*Lophostoma*, D'Orb.)

Not having seen a specimen of the *Lophostoma sylvicolum* of D'Orbigny, I can only refer to the figures and description of the original describer, and to those more recently given by M. Gervais in his account of the Chiroptera collected during the travels of M. de Castelnau.

General outline rather more like that of *Phyllostoma* than in the preceding species, the wings being scarcely so broad, and the ears relatively somewhat smaller. Wing-membranes extending to the distal extremity of the tibia. Tail as in the last two species.

Dentition.—Incisors  $\frac{4}{2}$ ; premolars  $\frac{2-2}{3-3}$ .

First upper premolar much smaller than the second.

First lower premolar much larger than the second, which is small but not compressed, and is in the same line with the other teeth.

EX. *LOPHOSTOMA SYLVICOLUM*, D'Orb. Voy. Amér. mérid. Mam. p. 11. pl. 6, 1847.

*Obs.* As far as I can judge, without having examined a specimen, this species must be intimately allied to the so-called *Schizostoma*; but it is clearly a more typical *Vampyrus*, as the presence in the lower jaw of only two incisors, and the smaller size of the second premolar, sufficiently indicate.

### E. (*Mimon*, Gray.)

General proportions of body and limbs more like those of *Phyllostoma* than in any of the foregoing species. Ears large, ovoid and rather pointed; tragus elongate. Nose-leaf very long and pointed; its front, or horse-shoe part, more closely applied to the nose and somewhat broader than in *Vampyrus*. Lower lip with a smooth triangular space in front. Interfemoral membrane rather ample. Tail as in *Phyllostoma* and *Lophostoma*. Wing-membrane not extending beyond the *extremity of the tibia*, as in *Lophostoma*.

Dentition.—Incisors  $\frac{4}{2}$ ; premolars  $\frac{2-2}{2-2}$ .

First upper premolar much smaller than the second.

First lower premolar somewhat smaller than the second, which corresponds with the third in the species we have been considering, the small or intermediate one *being in this species absent*.

EX. *PHYLLOSTOMA ELONGATUM*, Geoff.

*P. bennettii*, Gray, Mag. Zool. Bot. ii. 1838.

*Mimon bennettii*, Gray, P. Z. S. 1847, p. 14.

*Obs.* A specimen in my own collection has been taken to the British Museum and found to be identical with the *Phyllostoma bennettii* of Dr. Gray; afterwards to the Leyden Museum, and found to resemble the *P. elongatum* of that collection; and finally compared with the type of *P. elongatum* in the Paris Museum, and proved to be identical with it.

This species may be said to approximate in its dentition, and in some measure in the degree of development of some parts of its cutaneous system, the restricted *Vampyrus*, the general outline at the same time retaining considerable resemblance to *Phyllostoma*. M. Gervais erroneously gives four lower incisors to this species.

### F. (*Tylostoma*, Gerv.; *Vampyrus*, Spix.)

General form and proportions much as in *Phyllostoma*, but the development of membrane slightly more ample. Ears rather larger, but of smaller size than those of the preceding species. Wing-mem-

branes extending to the extremity of the tibia. Nose-leaf of moderate size, adherent to the lip in front.

Dentition.—Incisors  $\frac{4}{2}$ ; premolars  $\frac{2-2}{2-2}$ .

The dentition of this species resembles that of the *Phyllostoma elongatum* of Geoffroy.

Ex. VAMPYRUS BIDENS, Spix.

*Tylostoma bidens*, Gerv. Voy. Casteln. 1855.

*Phyllostoma childreni*, Gray, Mag. Zool. Bot. ii. 1838.

*Phyllostoma bidens* of the Paris Museum.

*Phyllostoma lituratum* of the Leyden Museum.

Obs. M. Gervais gives the *Vampyrus bidens* of Spix, and the *Phyllostoma crenulatum* of Geoffroy, as the types of his genus *Tylostoma*. The latter of these two species I have not examined, but have suspected that it might prove identical with the *Vampyrus cirrhosus* of Spix. Dr. Gray's *Trachops fuliginosus* is, however, identical with *V. cirrhosus*; and having lately examined the species from which Dr. Gray took his description, I am able to state that it has four lower incisors, whereas the *Phyllostoma crenulatum* (according to M. Gervais) has two only.

G. (*Trachops*, Gray; *Tylostoma*, Gervais, in part?; *Vampyrus*, Spix.)

General form and proportions as in *Mimon*. Ears, tragus, and hinder extremities similar. Nose-leaf of two distinct parts—an anterior horse-shoe, having its front margin scarcely raised from the lip, and a posterior hastate portion springing from the centre of the horse-shoe. All the margins of the nose-leaf crenulated; and the lower lip and chin thickly covered with small but prominent warts.

Dentition.—Incisors  $\frac{4}{4}$ ; premolars  $\frac{2-2}{2-2}$ .

The only respect in which *Trachops* can be said to differ materially from *Tylostoma*, is in being possessed of four lower incisors, and in having the nose-leaf and chin marked with crenulations and warts.

Ex. VAMPYRUS CIRRHOSUS, Spix.

*Trachops fuliginosus*, Gray, P. Z. S. 1847.

*Phyllostoma crenulatum*, Geoffroy?

Observations on the foregoing species.—The species, the characters of which I have given above, constitute a group, of which the most obvious peculiarities are the great development of the membranes and ears, the rounded form of the wings, and the length and softness of the fur. These superficial characters are common to all of them. The simple and entire form of nose-leaf is a peculiarity which most of them possess; and those which do not, have their membranes also less remarkably developed.

In the shape of the cranium there is considerable discrepancy in the several species, the chief difference consisting in the greater or less degree of elevation of the cerebral region; and as this appears to

hold about the same relative proportion which is usually observable in the larger and smaller species of any natural group, it cannot be made any proper use of in determining the limits of genera. But the incisors and premolars in the lower jaw exhibit considerable diversity, not only in regard to number, but in size and relative proportion also.

These peculiarities in the dentition, in connexion with the superficial ones above stated, appear to me to supply the most certain means by which to classify the several species; and I will now proceed to state what I regard as their relationship with each other.

The normal number of incisors in *Phyllostoma* is *four* in each jaw; and the number of premolars is *two* on each side, above and below. In the *Vampyrus spectrum* this normal number of incisors obtains; but among the premolars in the lower jaw is an additional one. In *V. auritus*, having an expansion of membrane not inferior to that of *V. spectrum*, this supernumerary premolar is of rudimentary form, and though irregular in position, is nevertheless present, and is accompanied by an abnormal number of inferior incisors, which are reduced to *two*. This species, then, I regard as possessing the collective characters of *Vampyrus* more fully than any other. Of *Lo-phostoma sylvicolum* I can say but little, not having examined a specimen. It appears to make a somewhat near approach to *Vampyrus auritus*, excepting that the wings are narrower, and the ears less developed, in which respects it may make some approach to the following species. *Schizostoma* appears in general conformation, and in dentition, to come nearest to *V. spectrum*, but differs in having a tail, and in having the membranes of the wings extend only to the distal extremity of the tibia. The two following so-called genera *Mimon* and *Tylostoma* are identical, and intermediate between *Vampyrus* and *Phyllostoma*. With the lower incisors of the former they have the lower premolars of the latter, and an intermediate general outline. The last genus, *Trachops*, has the dentition of *Phyllostoma*, and resembles *Vampyrus* in its large oval ears and considerable breadth of alar membrane.

We have in these species a complete gradation from *Vampyrus* to *Phyllostoma*; and while I admit these as distinct genera, I am scarcely willing to admit the intermediate and allied forms which are here brought together, as even of subgeneric pretensions. This will be better understood by looking at the exact amount of difference between the species most typical of these genera (i. e. *Vampyrus auritus* and *Phyllostoma hastatum*); and it will be seen that it is merely one of *degree*, of which *degree* the remaining species constitute the middle portion.

Perhaps it will seem that sufficient importance has not been attached to the presence or absence of a tail in these species. In nearly all the *Phyllostomidæ* the tail is of rudimentary proportions, seldom exceeding half the length of the interfemoral membrane. I have usually observed that, when an organ is but feebly represented throughout a group of Mammals, it commonly presents varied degrees of development in different species in that group, and even in

some may be wholly absent. When this is the case (and it is the case with the tail of the *Phyllostomidae*), it will only lead to error if made use of as a means whereby to define minor groups. It is amongst those characteristics which by their prominent development mark out large groups of species, that we should look for the modifications required for the definition of the smaller groups.

## 2. ON THE ANATOMY OF MONITOR NILOTICUS FROM WESTERN AFRICA, AND OF REGENIA ALBOGULARIS. BY DR. ALBERT GÜNTHER, FOR. MEMB. Z.S.

Several anatomists have examined specimens of the family of *Monitores*, and found important anatomical characters which appear to be common to all the members of the family. Cuvier, Meckel, Stan-  
nius, and others describe the structure of the tongue, of the salivary glands, of the trachea, of the kidneys, &c. But few of them have been careful enough in the determination of the species examined; and, although there is no doubt that, for instance, Cuvier had dissected specimens of *Monitor niloticus*, it is evident that, under the denomination of *Tupinambis* (as he calls the genus)\*, he has confounded very different species,—a urinary bladder, which he ascribes to that genus, not being found either in *Regenia* or in *Monitor niloticus*.

The specimen of the latter animal which I have examined is 5 feet long, and 15 inches in its greatest circumference. It was brought to the Gardens at nearly the same time as the *Regenia ocellata*†, and probably came from the same locality. The habits of both were very much alike, the *Monitor* more freely taking to the water. Its food consisted of eggs and pieces of meat.

The long, vermiform *tongue* terminates in two slender points, the cartilaginous extremity of which is less prolonged than in *Regenia*; it is received posteriorly into a long sheath of the mucosa, whilst its anterior portion moves in a longitudinal groove formed by the salivary organs. The latter are composed first of an elongate glandular mass, situated below the tongue, and forming the bottom of that groove; it represents a *glandula sublingualis*, each single glandule opening by a separate orifice. On each side of this gland, there is situated another which is elongate like the former, but much thicker, especially posteriorly; it forms the lateral portion of that groove in which the tongue moves, and can be considered either as a separate division of the *glandula sublingualis* of higher animals or as a *glandula submaxillaris*; the ducts of its portions are united into several short ducts, which empty the saliva through pores behind the front teeth. There are, besides, numerous solitary glands, arranged in longitudinal series.

\* Vorlesung. in vergl. Anat. übers. v. Froriep & Meckel, ii. p. 664. t. 15. f. 3; iii. p. 201; iv. p. 641, etc.

† See *anteà*, p. 60.

The pharynx and the upper parts of the œsophagus are not black, as in *Regenia* and other *Varani*. The *œsophagus* is provided with numerous low longitudinal folds, and passes without distinct separation into the long, pad-like stomach. Its mucous membrane is very thick, and forms irregular thick folds, anastomosing with one another, and chiefly running in a longitudinal direction. Its muscular membrane has a tendinous appearance, and becomes thicker in the pyloric region, the width of a vertical cut being two lines and a half; there is, besides, a longitudinal tendinous, pad-like protuberance on each side of the pyloric extremity. The whole structure distinctly shows that this is a true pylorus, and that the part behind it belongs to the intestinal tract\*. This commencement of the intestine, which is nearly the same as in *Regenia*, and which we have called there a duodenum, is 20 lines long, not wider than, and separated from, the small intestine by a circular valve, which is  $1\frac{1}{2}$  line deep. The entrance of the ductus choledochus is 15 lines below that valve. The valvulæ conniventes run in an oblique direction from the mesenterial line towards the side opposite, parallel to one another, and always a higher alternating with a lower one; they are provided with numerous delicate villi. The valvulæ become deeper, less oblique, and more transverse in the posterior portion of the jejunum; and the villi here are coarser and more numerous. The jejunum passes into the ilium or into the portion without valvulæ, quite suddenly. This portion is wider than the jejunum, and provided with Peyerian glands, which are less numerous than in *Regenia*, and less distinct; so that perhaps they might have escaped my observation, if my attention had not been previously directed to them by their occurrence in *R. ocellata*. The passage into the wide rectum is narrow, and without a valve behind. The cloaca is separated from the rectum by a broad fold of the mucous membrane.

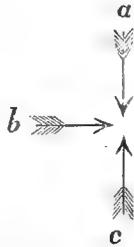
The length of the stomach is 5 lines, of the jejunum 21, of the ilium 11, and of the rectum with the cloaca 5.

The *liver* is large, divided by a comparatively small notch into a right and left lobe; both are depressed, elongato-ovate, and the right one is nearly twice the size of the left one, having a small elongate lobule appended at its posterior part. The gall-bladder is round, of moderate size, and partially imbedded in the substance of the liver.

The *heart* is situated as in *Regenia*. The separation of the two atria is complete, and the right one is rather larger than the left; both are provided with trabeculæ carneæ. The right atrium receives the blood from two venæ cavæ superiores (externa et interna) and from a very large vena cava inferior; the circumference of the former is 8 and 9 lines, of the latter 16; the vena cava superior interna, however, has a considerably narrower lumen where it enters the atrium than in the part next above. All the three venæ enter the atrium at the same spot from behind, near the septum atriorum. The directions of the currents of blood are such that that from the

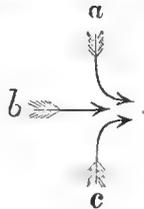
\* A similar division of the intestinal tract, found in the Crocodiles, is described as a part of the stomach (Stann. & Sieb. ii. p. 110), and, as we think, with better right, that division being much wider than the small intestine.

vena cava superior externa is diagonally opposed to that from the v. cava inferior, and that the current from the v. cava superior interna coming from the left is at right angles with the concurrence of the former.



- a. Vena cava superior externa.  
 b. Vena cava superior interna.  
 c. Vena cava inferior.

It is evident that the free entrance of the blood would be considerably protracted, if the currents were permitted to meet one another in such opposite directions. In order to prevent this, the atrium is provided with two broad valvulæ, the inferior across the orifice of the v. cava inferior, the superior across that of the v. cava superior externa; their free margins run in the direction of the current of the inner v. cava superior. When we bring those two valvulæ into the most natural position possible, it becomes evident that they not only prevent a backward motion of the blood from the atrium during its systole, but also modify the directions of the currents from the venæ during the diastole; so that the current from the v. cava superior externa is turned more outwards and more to the left, that from the v. cava inferior more inwards and more to the left, whilst the third current appears to preserve its direction (thus).



The two venæ pulmonales enter the left atrium by two distinct orifices, one at the side of the other. The left ventricle is very small, and does not emit a blood-vessel; it communicates with the right ventricle by a large opening, which can be completely shut by either of the two large valvulæ situated at each of the ostia venosa. The right ventricle has a conus arteriosus, which is as wide as the ventricle itself. The arteria pulmonalis is single, whilst the two aortæ have separate lumina; each of those arteries has the usual pair of valvulæ at its origin.

The *trachea* has the cartilaginous rings not closed on the dorsal side, and is divided into the two bronchi at some distance from their

entrance into the lungs. Each bronchus enters the lung a little above the middle of its length, and emits a short branch with cartilaginous rings for the upper portion of the lung: the principal stem does not penetrate far into the substance of the lung; its cartilaginous rings soon disappear, and there remains only a membranaceous tube with numerous lateral openings. The lungs of both sides are nearly equally developed and of moderate capacity; their interior is amply provided with cells and meshes, less so in their posterior extremity.

The *kidneys* are elongato-cuneiform, entirely separated from each other, and of equal size. Each is formed by about twenty lobes, which are united only at the base. Each ureter is somewhat widened before its termination, and opens together with the vas deferens of its side in a small papilla, situated behind the valve which separates the rectum from the cloaca. There is no urinary bladder.

The *testicles* are subglobular; the right one is situated nearly on the middle of the abdominal cavity, the left one a little more downwards. The vas deferens is convoluted in its whole length, running downwards along the inner side of the kidneys and of the ureters. The double penis is  $3\frac{1}{2}$  inches long when everted from the sheath in which it lies concealed; there is a groove running from the seminal papilla along its whole length. The glans has on each side eight cartilaginous transverse lamellæ with ruffled margins, and terminates in two white cartilaginous bodies similar in form to the root of a human tooth, the one being simple, the other branching again into three short processes. It is very singular that not only the sheath in which the inverted penis lies, but also the penis itself, cast their skin like the other external parts.

The musculus retractor penis, as in all the Saurians, moves in a sheath between the superficial caudal muscles and the muscles of the hæmapophyses; the latter differ from the other muscles by their white colour, by their softness, and by the loose connexion of the different layers: they have quite the appearance of the muscles of fishes; and many of the layers have their outer margin free, not attached to the aponeurotic membrane of the sheath. The muscular fibres are transversely striped.

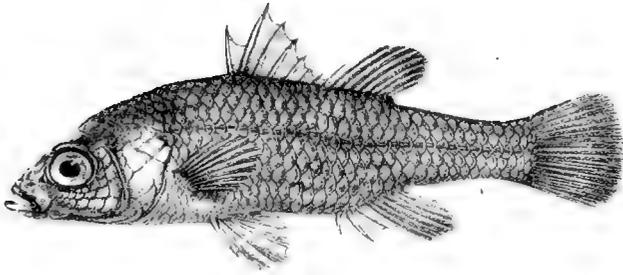
Peritoneal ducts leading outwards, as they have been observed by Plumier, Geoffroy, and Owen in Crocodilians, do not exist in this species.

*Fatty masses*, of the same appearance and situated at the same place as in *Regenia*, are found in this species. Although of enormous size, when compared with similar collections of fat in other reptiles, yet they are relatively smaller than in *Regenia*, equalling about the eighth part of the weight of the entire animal.

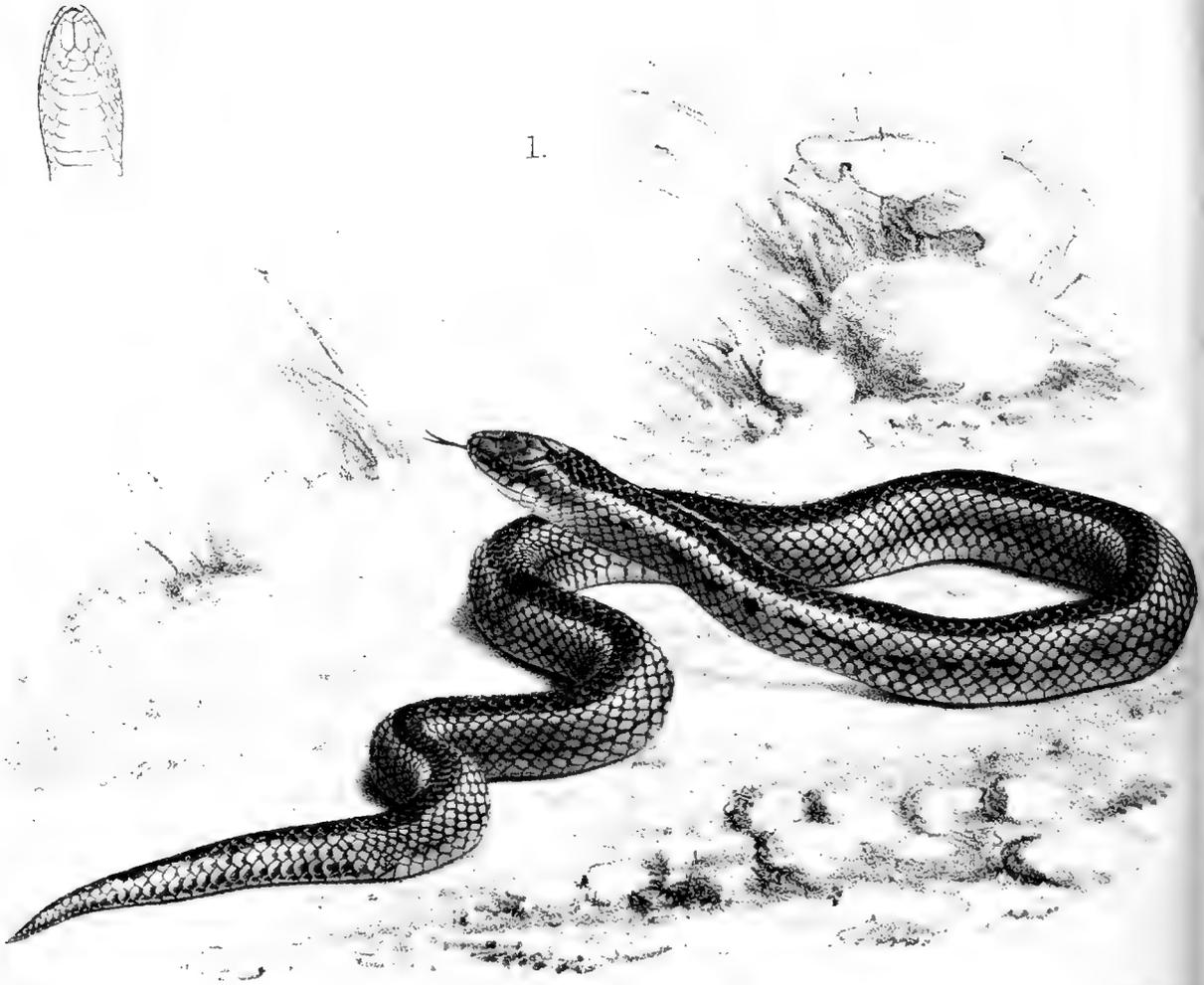
The *cause of death* may be considered to have been an extensive ulcer of the stomach, situated on the curvatura major, nearer to the pylorus than to the stomach. The stomach itself was empty; there was a small quantity of extravasated blood between the mucous and muscular membrane round the ulcer. The rest of the intestines and the other parts of the cavity of the chest and of the abdomen had a quite healthy appearance. Very small irregular patches of a chalk-like



2.



1.



concretion were disseminated through the whole substance of all the lower and lateral muscles of the thorax and of the abdomen.

After having finished my notes on the anatomy of *Monitor niloticus*, I received from the Society's Menagerie a specimen of a third species, *Regenia albogularis*, which had died there shortly after its arrival from Port Natal. It proved to be a female, and was 40 inches long, and 11 in. its greatest circumference. It was in a very emaciated state, and had died from an extensive disease of the intestinal tract, the upper portion of the jejunum and the entire ilium being covered with ulcerations, and with hardened purulent exudations. The fatty masses observed in the two other species were present, but shrunk to a thin layer of fat. The two genera *Regenia* and *Monitor* being closely allied, the present species does not differ from what I have previously noted in any of the principal points, more resembling *R. ocellata* in some minor respects, and in others *M. niloticus*. It has the black pharynx, the curved stomach, the nine-lobed kidneys, the uterine sac of the former; whilst the form of the sublingual and submaxillary glands, and that of the liver with the gall-bladder, are exactly the same as in *M. niloticus*. I have, however, been able to ascertain some other points, by giving which my notes on these highly organized Saurians will be rendered more complete.

1. There is a collection of glandules along the outer side of the mandibular bone, forming a sublabial salivary gland; the fluid is emptied by a series of numerous small foramina between the lip and the jaw.

2. The ovarium is narrow, elongate, equally developed on both sides; it contained eggs from the size of a pea to that of the head of a pin (in March).

3. The uterine sac on the dorsal side of the rectum, which I have described in *R. ocellata*, is equally developed in this species, and divided superiorly into two short horns, one for the ostium of each of the oviducts; the ostia were wide enough for a tubulus of 2 lines diameter.

4. The *clitorides* are double, similar to the penis, and each of them terminates in two small cartilaginous processes.

### 3. ON THE OPHIDIANS OF THE PROVINCE OF BAHIA, BRAZIL. BY DR. OTHO WUCHERER, CORR. MEMB. (Part I.)

(Plate XIX.)

In the present paper I propose to give a list of the Snakes in the province of Bahia, which I have been able to collect during the last two years, enumerating them in the order in which they occur in the Catalogues of the British Museum, and adding such remarks as I may be enabled to make.

PROC. ZOOL. SOC.—1861, No. VIII.

Of the family of *Crotalidæ* I have seen :—

1. *Craspedocephalus atrox*.
2. *C. bilineatus*.
3. *Lachesis mutus*.
4. *Crotalus horridus*.

Of these the first seems to be the most common, particularly in some districts. To judge by what I have heard of the danger of its frequent bite, and what is commonly stated concerning the number of victims of the *Fer de lance* in the West Indies, *C. atrox* is a much less dangerous animal than *C. lanceolatus*. The frequent occurrence of the bite of *C. atrox* is easily accounted for, as it is commonly met coiled up in the middle of footpaths, and is not easily disturbed unless trod upon. Neither *C. lanceolatus* nor *C. brasiliensis* have as yet been observed by me. Of the scarce *C. bilineatus* I have only seen two specimens; but I hear that six specimens have been found together in the colony Leopoldina, near Ilheos. I shall refrain from making any further remarks on this genus until I shall have collected more specimens for comparison than I at present possess. All my specimens of *C. atrox* differ from those described by herpetologists in having fewer longitudinal series of scales (23–25).

*Lachesis mutus* is far from being scarce. The largest specimen I have seen measured 10 feet.

*Crotalus horridus* is chiefly an inhabitant of the interior of the province, but is not very scarce on a row of hills which extends through the city of Bahia. In some parts of the province (for instance in Ilheos) it has, according to trustworthy testimony, never been seen.

Of the family *Viperidæ*, the only species, according to Dr. Gray, which is found in the Western World is Peruvian.

Of the numerous freshwater species of the family of *Hydridæ* few representatives seem to occur in the Brazils, *Helicops angulatus* being perhaps the most common species in this province. A second species, *Helicops leprieurii*, Dum. et Bibr., still appears to be scarce in the collections. Perhaps a description taken from fresh specimens may facilitate its identification.

*Diagnosis*.—Head ovate, short; three frontals, anterior trigonal, between the nasals; labials entire; superciliaries large, almost of the length of vertical; vertical elongate; loreal distinct; one or two anterior and two posterior oculars; occipitals elongate; body fusiform; scales in nineteen rows, truncated, polished, smooth, those of middle and of hinder part, of back and tail keeled; tail distinct, tapering.

*Description*.—Head ovate, flat on the vertex, not very distinct; cleft of mouth moderate; eyes superior, moderate, pupil round; three frontals, anterior small and almost triangular (irregularly quadrangular, with an obtuse posterior angle); nostrils superior, between two nasals; vertical moderate, elongate, with the lateral edges parallel or slightly divergent posteriorly, rectangular behind; occipitals large, elongate; eight upper labials, entire, the seventh much larger than the rest, fourth and fifth reaching the eye, rostral broader than

high, its upper angle very obtuse; series of teeth of moderate length, posterior tooth longest, grooved, anterior all equal; body fusiform; tail distinct, rather short, tapering; scales moderate, truncated behind, polished, in nineteen rows, those of anterior part and of sides of body smooth, of posterior part and of tail keeled; no scales of the middle line in any part larger; ventral shields narrow; anal divided; subcaudals in two rows.

Above olive, with three darker longitudinal streaks, or rows of spots sometimes confluent, alternating in the different rows; inferior half of upper labials and body beneath yellowish; belly and tail beneath with transverse black streaks, some of which do not reach across (chequered as in *Liophis*).

Length of cleft of mouth  $\frac{5}{8}$  inch, breadth of head  $\frac{5}{8}$  inch; length of tail  $5\frac{1}{2}$  inches; total length 22 inches.

The specimen described is in the collection of the British Museum.

This Snake is not very rare in the moist valleys in and about the city of Bahia.

Of the family *Boidæ* some of the most formidable members occur here as in other parts of Brazil.

1. *Epicrates cenchria*,
2. *Xiphosoma caninum*,
3. *Boa constrictor*, and

4. *Eunectes murinus* have been noticed by me. The most common species in Bahia appears to be *Eunectes murinus*. It is the "*Sucurujaba*" of the natives, and is very frequently seen in close proximity to the town of Bahia, but very large specimens are here but seldom found. On the borders of the S. Francisco river they attain an enormous size. I should rather think that it must have been this snake, and not the *Boa constrictor* which Dr. Gardner in his 'Travels in Brazil' mentions as having swallowed a horse. The *Boa* does not grow so large by far. *Eunectes murinus* seems to possess an extraordinary capability of fasting; a friend of mine kept the largest specimen I ever saw in close confinement for three years, and it was never known to swallow anything during this whole period. It died much emaciated.

The first species of the family of *Calamariidæ* which I have met with is new, and I conclude this first part of the paper with a description of it:—

#### GEOPHIS GÜNTHERI. (Pl. XIX. fig. 1.)

*Diagnosis*.—Upper labials seven, the third and fourth coming into the orbit; a single pair of chin-shields. Dirty-orange, with a longitudinal jet-black band from the occiput to the end of the tail.

*Description*.—Total length  $12\frac{3}{4}$  inches; length of tail  $1\frac{3}{4}$  inch; head indistinct, depressed. Body almost cylindrical; tail cylindrical, tapering. Cleft of mouth short; eyes moderate. Rostral shield broad, just reaching the surface of the head; two pairs of frontals, the anterior pair in direct contact with the rostral; the posterior frontals reaching the orbits; vertical almost regularly triangular; superciliaries moderate, occipitals rather large and elongate, slightly forked

behind. Nasal pierced by the nostril. Loreal none. Anterior ocular elongate, not touching the supraorbital. Two posterior oculars sometimes confluent into one. Seven upper labials, the third and fourth reaching the orbit, the sixth and seventh largest; two temporals on the side of the occipital, the anterior one touching both posterior oculars. Series of maxillary teeth short, the hinder longest, not grooved. Ground-colour dirty orange; crown blackish. From the occiput to the tip of the tail a longitudinal jet-black streak with sharply defined edges, forked just behind the occiput into two diverging extremities, which cover the edge of the occipitals; tips of light-coloured scales black. On the sides of the body some irregular black spots, which, on the posterior of the body, form an uninterupted narrow line.

The specimen described was sent to me from Caunavieras, which is to the south of the city of Bahia. It is now in the British Museum. According to information received from Dr. Albert Günther, this is a new species, belonging to the genus *Geophis* of Wagler. I propose to name it after him, in acknowledgment of his unremitting kindness in aiding my endeavours to become acquainted with the Brazilian Ophidians.

Bahia, February 11th, 1861.

4. ON A NEW GENUS OF AUSTRALIAN FRESHWATER FISHES.  
BY DR. ALBERT GÜNTHER, FOR. MEMB. ZOOL. SOC.

(Plate XIX.)

Fam. PERCIDÆ.

Group APOGONINA.

NANNOPERCA.

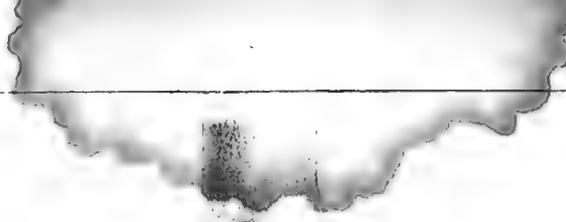
Body compressed, oblong, covered with scales of moderate size. Dorsal fins slightly continuous at the base, the first with seven spines. No recumbent spine before the dorsal fin. Three anal spines. Narrow bands of villiform teeth in the jaws, on the vomer and the palatine bones. None of the bones of the head serrated. Branchiostegals six; pseudobranchiæ present. Lateral line none.

NANNOPERCA AUSTRALIS. (Pl. XIX. fig. 2.)

B. 6. D.  $7 \frac{1}{8}$ . A.  $\frac{3}{7}$ . V.  $1/5$ . L. lat. 30. L. transv. 12.

This species resembles a young Perch in general appearance, but is more elongate; the greatest depth of the body is above the root of the ventral fin, and contained four times and five-sevenths in the total length; the length of the head is contained three times and two-thirds in it. The snout is moderately produced, as long as the orbit, with the cleft of the mouth oblique and rather narrow, the maxillary extending to below the front margin of the orbit. The lower jaw projects beyond the upper. The teeth are villiform, those of the palatine bones minute and forming only a short series. The





5



4



7



6



8



9



10

eye is of moderate size, one-fourth of the length of the head, and much wider than the interorbital space. The scales advance superiorly to between the hind margin of the orbits, and inferiorly to the præorbital. None of the bones of the head are serrated; the præoperculum has two ridges along its margins, like *Apogon*, but the ridges are very close together. The spinous dorsal fin commences somewhat nearer to the snout than to the root of the caudal; the length of the first spine is not quite one-half of that of the second, which is the strongest and longest, its length being one-half of that of the head; the following spines rapidly decrease in length. The soft dorsal fin is slightly continuous with the spinous, both being nearly equal in height; its anterior spine is short, although longer than the last of the spinous dorsal. Caudal fin rounded, its length is contained six times and a half in the total. Anal spines strong, the second and third are nearly equal in length. The root of the ventrals is situated behind that of the pectorals; they do not quite extend to the vent, and are as long as the pectorals. The colour appears to be greenish above, each scale having a darker margin.

Two specimens of this fish, the larger of which is 33 lines long, were received from the Murray River, and, having been given me for determination by Mr. Holdsworth, are now deposited in the British Museum Collection.

5. LIST OF ENTOZOA, INCLUDING PENTASTOMES, FROM ANIMALS DYING AT THE SOCIETY'S MENAGERIE, BETWEEN THE YEARS 1857-60 INCLUSIVE, WITH DESCRIPTIONS OF SEVERAL NEW SPECIES. BY T. SPENCER COBBOLD, M.D., F.L.S.

(Plate XX.)

During the interval above-mentioned I find that 122 different animals have been specially examined by me with reference to the presence or absence of Entozoa. This number of individuals represents upwards of 100 distinct species, 38 of which (or, in round numbers, about one-third) were found infested. Of these 38 there are 19 mammals, 14 birds, and 5 reptiles. The mammalia harboured 6 trematodes, 8 cestodes, 5 nematodes, and 1 species of pentastome,—larval and immature forms being included. The birds contained 2 trematodes, 6 cestodes, and 14 nematodes; whilst the reptiles were infested by 2 flukes, 1 tape-worm, 6 round-worms, 1 acanthocephalous helminth, and 1 pentastome. Altogether I have found in 38 vertebrate species no less than 51 different forms of Entozoa, comprising 10 trematodes, 15 cestodes, 23 nematodes, 1 acanthocephalous entozoon, and 2 pentastomes.

In very few instances can these parasites be said to have been the entire cause of death; but in several cases they manifestly contributed to bring about that result, and in one instance their presence was the sole cause of death. This was evident in a Ring-tailed Lemur

from Madagascar, where the thorax and liver were crammed with a very singular form of *Cœnurus*: the several bunches or colonies of them in the right side of the chest had caused a remarkable atrophy of the right lung, that of the left side being also much diminished in bulk. The liver was similarly affected.

In all cases I have been careful to ascertain, as far as possible, whether or not the several species of Entozoa found by me were previously known to science; I mention this because I have no wish to imitate those who take little trouble on this score, and carefully describe every parasite as new, which may haply or otherwise come within their possession. Excluding pentastomes, 31 of the following are adult forms, and yet only 11 of these proved new to science; a few of the latter being peculiar and of great interest.

### Order I. TREMATODA.

#### 1. *DISTOMA COMPACTUM*, Cobbold.

Five examples in the left lung of an Indian Ichneumon (*Viverra mungos*, L.), which had lived in the Society's Gardens about twelve months. Examined Feb. 19, 1857.

*Cabinet Collection*, T. S. C. no. 67.

*Desc.* Linn. Trans. xxii. p. 363. t. 63. f. 1-3.

#### 2. *BILHARZIA MAGNA*, Cobbold.

A solitary specimen in the portal blood of the Sooty Monkey (*Cercopithecus fuliginosus*). Ex. Dec. 4, 1857.

*Cab. Coll.* T. S. C. no. 57.

*Desc.* Linn. Trans. *l. c.* p. 364. t. 63. f. 8, 9; Synopsis of Distomidæ, Proc. Linn. Soc. v. p. 31.

#### 3. *DISTOMA CONJUNCTUM*, Cobbold.

Numerous examples in the biliary ducts of an American Red Fox (*Canis fulvus*). Ex. Dec. 24, 1858.

*Cab. Coll.* T. S. C. no. 88.

*Desc.* In Synops. Distom., Proc. Linn. Soc. v. p. 8; figs. will be given in Linn. Trans. xxiii. pt. 2.

#### 4. *DISTOMA MINUTUM*, Cobbold.

Multitudes, scarcely perceptible to the naked eye, in the duodenal mucus of an Oyster-catcher (*Hæmatopus ostralegus*, L.). Ex. Feb. 19, 1857.

*Desc.* Linn. Trans. xxii. p. 364. t. 63. f. 4, 5.

#### 5. *DISTOMA ÆQUALE*, Dujardin.

Nine examples detected in the intestines of an American Barn Owl (*Strix perlata*). Ex. Jan. 8, 1858.

*Cab. Coll.* T. S. C. no. 60.

*Note.* Linn. Trans. *l. c.* p. 365; Synops. Dist., P. L. S. v. p. 14.

6. *DISTOMA BOSCHII*, Cobbold.

Numerous specimens in the mouth, trachea, and lungs of an American species of *Coluber*, which died from cancer of the stomach.

*Cab. Coll.* T. S. C. no. 70.

*Desc.* Linn. Trans. *l. c.* p. 364. t. 63. f. 6, 7. Synops. Dist. in P. L. S. v. p. 19.

7. *DISTOMA CORONARIUM*, Cobbold.

*Corpus lineare, depressum, retrorsum parum attenuatum; collum continuum; caput obconicum; os terminale globosum, limbo echinato, spinis ad numerum 24; acetabulum ore duplo minus, apertura circulari.*

Long.  $\frac{1}{4}$ , crassit.  $\frac{1}{35}$  unc.

Numerous examples from the intestines of an Alligator (*Alligator mississippiensis*). Ex. Dec. 25, 1860.

*Cab. Coll.* T. S. C. no. 91.

*Larval and immature Trematoda.*8. *CERCARIA CERVI*.

Numerous degenerated examples in the liver of an Axis Deer (*Cervus axis*). Ex. Feb. 19, 1857.

9. *CERCARIA MACACI*.

Several specimens in the liver of *Macacus radiatus*. Ex. Feb. 19, 1857.

10. *CERCARIA CERCOPITHECI*.

One example in the liver of the Sooty Monkey (*Cercopithecus fuliginosus*). Ex. Dec. 4, 1857.

## Order II. CESTODA.

1. *TENIA PUSILLA*, Goeze.

A single specimen, upwards of 20 inches in length, in the intestine of a Rat (*Mus rattus*) destroyed in the Society's Gardens. Ex. Jan. 7, 1859.

2. *TENIA PARADOXA*, Rudolphi.

Numerous examples in the duodenum of the Oyster-catcher (*Hæmatopus ostralegus*, L.). Ex. Feb. 19, 1857.

*Note.* Linn. Trans. xxii. t. 63. f. 16-19.

3. *TENIA MULTIFORMIS*, Creplin.

Ten or twelve specimens from the small intestines of the Night Heron (*Ardea nycticorax*). Ex. Jan. 2, 1858.

*Note.* Linn. Trans. *l. c.* p. 365. t. 63. f. 23.

## 4. TÆNIA INFUNDIBULIFORMIS, Goeze.

Numerous proglottides, but only one head, found in the intestines of the Horned Pheasant (*Phasianus* —?). Ex. Jan. 15, 1858.

*Cab. Coll.* T. S. C. no. 63.

*Note.* Linn. Trans. *l. c.* p. 365. t. 63. f. 25.

## 5. TÆNIA LANCEOLATA, Bloch.

Several specimens in the intestines of the Dusky Duck (*Anas obscura*). Ex. Jan. 30, 1858.

*Note.* Linn. Trans. *l. c.* t. 63. f. 20.

## 6. TÆNIA LÆVIS, Bloch.

Numerous proglottides and fragments, probably of this species, in the intestines of *Anas obscura*, associated with the above.

*Larval, immature, and imperfect Cestoda.*

## 7. CÆNURUS LEMURIS.

Several multilocular masses or colonies occupied the lungs and liver of the Ring-tailed Lemur of Madagascar (*Lemur maco*), and had caused the death of the animal, which had been only four months in the Society's possession. Ex. Jan. 1, 1858.

*Desc.* Linn. Trans. *l. c.* p. 365. t. 63. f. 12-15.

## 8. ACEPHALOCYSTIS MACACI?

A single example, floating in some serous fluid within the left cavity of the thorax of a Macaque (?). Length  $\frac{1}{4}$  of an inch; breadth  $\frac{1}{12}$  inch. Ex. Jan. 8, 1858.

## 9. ACEPHALOCYSTIS OVIS TRAGELAPHI.

A solitary specimen filled with a clear serous fluid. Probably an aborted *Cœnurus*. Spherical; 1 inch in diameter. Ex. Jan. 8, 1858.

## 10. ECHINOCOCCUS ALTRICIPARIENS, Küchenmeister.

Several large cysts filled with the brood of this entozoon in the lungs of the Four-horned Antelope (*Antilope quadricornis*). Ex. Feb. 19, 1858.

*Cab. Coll.* T. S. C. no. 79.

*Note.* Linn. Trans. *l. c.* p. 266.

## 11. LIGULA COLUBRI BLUMENBACHII.

Several specimens in the abdominal cellular tissue and lateral muscles. Ex. Jan. 1, 1858.

*Note.* Linn. Trans. *l. c.* p. 366. t. 63. f. 31.

## 12. CESTOIDEUM AMADINÆ.

Numerous proglottides and fragments of a *Tænia* in the intestines of *Amadina cucullata* from Western Africa.

## 13. CYSTICERCUS TENUICOLLIS.

Two specimens attached to the mesentery of a Spring-Bok (*Gazella euchore*). Ex. April 22, 1859.

## 14. CYSTICERCUS PHACOCÆRI ÆTHIOPICI.

One example in a cyst near the colon. Ex. Dec. 19, 1859.  
*Desc. Proc. Zool. Soc. for March 12, 1861, with figs.*

## 15. CYSTICERCUS POTAMOCHÆRI PENICILLATI.

One example from the liver, and four from the mesentery. Ex. Nov. 16, 1860.

*Cab. Coll. T. S. C. no. 94.*

*Desc. Proc. Z. S. l. c. supra, with figs.*

## Order III. NEMATODA.

## 1. ASCARIS RETUSA, Rudolphi.

Several examples in the rectum of the Weasel-headed Armadillo (*Dasypus sexcinctus*). Ex. Jan. 15, 1858.

*Cab. Coll. T. S. C. no. 81.*

*Note. Linn. Trans. l. c. p. 365. t. 63. f. 22.*

## 2. STRONGYLUS PARADOXUS, Mehlis.

Three specimens in the bronchial tubes of a Peccary (*Dicotyles torquatus*). Ex. Jan. 22, 1858.

*Note. Linn. Trans. l. c. p. 365. t. 63. f. 28.*

## 3. TRICHOSOMA AËROPHILUM, Creplin.

Two individuals in the bronchi of an American Red Fox (*Canis fulvus*). Ex. Dec. 24, 1858.

*Note. An egg will be figured in Linn. Trans. xxiii. pt. 2.*

## 4. TRICHOCEPHALUS AFFINIS, Rudolphi.

Numerous examples in the cæcum and colon of a young Giraffe (*Camelopardalis giraffa*). Ex. Dec. 3, 1859.

*Cab. Coll. T. S. C. no. 85 & 85 a.*

*Desc. Will be given in Linn. Trans. xxiii. pt. 2, with several figs. and woodcuts. See also Zool. Soc. Proceed. for Feb. 14, 1860.*

## 5. SPIROPTERA OBTUSA, Rudolphi.

Numerous examples in the stomach of a Mouse (*Mus musculus*), accidentally trod upon in the Society's Gardens. The abdomen was greatly distended from their presence. Ex. Dec. 14, 1860.

## 6. EUSTRONGYLUS PAPILLOSUS, Diesing.

Three examples within the mouth of the Sarus Crane (*Grus antigone*). Ex. Jan. 16, 1858.

*Cab. Coll. T. S. C. no. 78.*

*Note. Linn. Trans. xxii. p. 365. t. 63. f. 24,*

## 7. TRICHOSOMA LONGICOLLE, Rudolphi.

Three specimens of a nematode from the intestines of the Horned Pheasant (*Phasianus* —?), probably referable to this species. Ex. Jan. 15, 1858.

*Cab. Coll.* T. S. C. no. 82.

## 8. ASCARIS VESICULARIS, Froelich.

The cæca of a Ring-necked Pheasant (*Phasianus torquatus*) were crowded with this species, the females being much more abundant than the males. Ex. Jan. 15, 1858.

*Cab. Coll.* T. S. C. no. 34 a.

*Note.* Linn. Trans. *l. c.* p. 365. t. 63. f. 21.

A few examples also in the cæca of a Black-backed Kaleege (*Euplocomus melanotis*) bred in the Society's Gardens. Ex. Dec. 14, 1858.

Multitudes also in the cæca of a Cheer Pheasant (*Phasianus wallichii*). Ex. Dec. 31, 1858.

## 9. ASCARIS DISPAR, Schrank.

Several examples in the cæca of the Sandwich Island Goose (*Bernicla sandwichensis*), associated with two other kinds of nematode. Ex. Jan. 30, 1858.

*Cab. Coll.* T. S. C. no. 75.

*Note.* Linn. Trans. *l. c.* t. 63. f. 26, 27.

## 10. TRICHOSOMA BREVICOLLE, Rudolphi.

Several specimens in the intestines of *Bernicla sandwichensis*, associated with the foregoing.

*Cab. Coll.* T. S. C. no. 76.

## 11. SPIROPTERA CRASSICAUDA, Creplin.

One individual in the intestines of *Bernicla sandwichensis*, along with the above.

## 12. ASCARIS TRIBOTHRIOIDES, Cobbold.

Two specimens in the intestines of the Dusky Duck (*Anas obscura*), associated with two kinds of Tæniæ. Ex. Jan. 30, 1858.

*Desc.* Linn. Trans. *l. c.* p. 365. t. 63. f. 10, 11.

## 13. ASCARIS DEPRESSA, Rudolphi.

One specimen in the stomach of the Bearded Vulture (*Gyps barbatus*). Ex. Jan. 31, 1859.

## 14. STRONGYLUS TUBIFEX, Nitzsch. (Pl. XX. f. 1, 2.)

Two specimens, one in the proventriculus and the other in the small intestine of an Ashy-headed Goose (*Chloephaga poliocephala*, Gray). Ex. Dec. 24, 1858.

## 15. STRONGYLUS NODULARIS, Rudolphi. (Pl. XX. f. 3, 4.)

Numerous specimens in the proventriculus of *Chloephaga poliocephala*, associated with the above.

16. *STRONGYLUS ACUTICAUDATUS*, Cobbold. (Pl. XX. f. 5, 6.)

*Caput angustatum obtusum, nudum; corpus flexuosum, compressiusculum; bursa maris biloba, subterminali, magna, lobo singulo quinqueradiato; extremitate caudali maris acuta; cauda feminæ subulata recta, apice acuminata.*

Longit. mar.  $\frac{1}{2}$ – $\frac{3}{4}$ , fem.  $\frac{1}{2}$ , crassit.  $\frac{1}{75}$  unc.

Numerous examples in the cæca of *Chloephaga poliocephala*, associated with the foregoing.

17. *STRONGYLUS SPICULATUS*, Cobbold. (Pl. XX. f. 7, 8.)

*Ascaris strongylina*, Rudolphi, Dujardin, Diesing.

*Caput conicum, nudum; corpus æquale, flexuosum; bursa maris biloba, lobis flabellatim multiradiatis; extremitate caudali maris longe spiculata, parum inflexa; cauda feminæ subulata, recta.*

Longit. mar. et fem.  $\frac{3}{8}$  unc.

Numerous specimens in the intestines of a species of Tinamou (*Tinamus* —?). Ex. Feb. 16, 1859. Natterer found it at Brazil in *T. tataupa* and *Perdix dentata*.

18. *ASCARIS LINEATA*, Cobbold.

*Caput nudum, conicum; os labiis indistinctis; corpus utrinque æqualiter attenuatum, rectum; extremitate caudali feminæ obsusata.*

Longit.  $1\frac{3}{4}$ , crassit.  $\frac{1}{40}$  unc.

One female specimen only in the intestines of an Alligator (*Alligator mississippiensis*), evidently not referable to *A. tenuicollis*, but probably distinct. Ex. Dec. 25, 1860.

*Cab. Coll.* T. S. C. no. 93.

*Larval, immature, and doubtful forms of Nematodes.*19. *FILARIA COLUBRI AMERICANI*.

In a cyst within the walls of the small intestine. Ex. Feb. 20, 1857.

20. *FILARIA COLUBRI BLUMENBACHII*.

Enclosed in a cyst in the muscular substance of the heart. Ex. Jan. 1, 1858.

*Note.* Linn. Trans. xxii. p. 366. t. 63. f. 30.

21. *FILARIA ARDEÆ NYCTICORACIS* (in ovo).

I have thought it worth while to notice under this head some very peculiar encysted ova, whose chitinous shell or chorion consists of regularly disposed coils like those described by Claparède in the eggs of *Ascaris spirotheca*, which infests the intestines of *Triton tæniatus*\*.

Some genetic relation may subsist here. The cysts were nume-

\* Claparède, 'De la formation et de la fécondation chez les vers nématodes.' Genève, 4to, 1859.

rous, and attached to the mesentery, and varied from  $\frac{1}{12}$ th to  $\frac{1}{8}$ th of an inch in length. Ex. Jan. 2, 1858.

*Cab. Coll.* T. S. C. no. 77.

22. *FILARIA GRUIS ANTIGONES* (in ovo).

Numerous ova, with embryos in various stages of development, resembling the foregoing. Chorion consisting of a coiled chitinous band. Ex. Jan. 16, 1858.

23. *FILARIA LACERTARUM*.

One example in the intestine of an East Indian Lizard (*Calotes versicolor*). Ex. Jan. 29, 1858.

24. *NEMATOIDEUM COLUBRI AMERICANI*.

One specimen in the small intestine. Ex. Feb. 20, 1857.

25. *NEMATOIDEUM COLUBRI BLUMENBACHII*.

One example in the stomach. Ex. Jan. 1, 1858.

*Note.* Linn. Trans. l. c. t. 63, f. 29.

Order IV. ACANTHOCEPHALA.

1. *ECHINORHYNCHUS INFLEXUS*, Cobbold. (Pl. XX. f. 9, 10.)

*Proboscis cylindrica, uncinorum seriebus sex; collum nullum; corpus elongatum, inflexum, compressiusculum, antrorsum crassius, retrorsum parum attenuatum et transverse rugosum.*

Longit.  $\frac{1}{2}$ -1 unc.

Numerous examples in, and attached to the mucous surface of, the intestines of a Snapping Turtle (*Chelydra serpentina*). A few were also within the abdominal cavity. Ex. Feb. 21, 1860.

PENTASTOMATA.

1. *PENTASTOMA OXYCEPHALUM*, Diesing.

Many specimens in the lungs of an Alligator (*Alligator mississippiensis*). Ex. Dec. 25, 1860.

*Cab. Coll.* T. S. C. no. 92.

2. *PENTASTOMA DENTICULATUM* \*, Rudolphi.

Numerous examples from the surface of the lungs and intestines of a Bubale (*Antilope bubalis*). Some encysted beneath the pleura. Ex. Feb. 10, 1859.

*Cab. Coll.* T. S. C. no. 84.

*Desc.* Experiments in Quart. Journ. of Microsc. Sc. vii. p. 202; further notice will be given with figs., Linn. Trans. xxiii. part 2.

\* Leuckart's researches leave us in no doubt as to this being the young of *P. tænioides*. See his recent work, 'Bau und Entwicklungsgeschichte der Pentastomen,' Leipzig und Heidelberg, 1860; also my translation (of a Memoir by him) in Microsc. Journal, vol. vii. p. 182.—T. S. C.

Several individuals were also obtained from the abdominal cavity of a Cape Guevi (*Cephalopus pygmæus*). Ex. Feb. 21, 1860.

Systematic arrangement of the infested animals, with the Entozoa found in them :—

## MAMMALIA.

- |   |  |
|---|--|
| 1. CERCOPITHECUS FULIGINOSUS.<br><i>Bilharzia magna.</i><br><i>Cercaria cercopitheci.</i> | 10. CERVUS AXIS.<br><i>Cercaria cervi.</i>                         |
| 2. MACACUS RADIATUS.<br><i>Cercaria macaci.</i>   | 11. CAMELOPARDALIS GIRAFFA.<br><i>Trichocephalus affinis.</i>      |
| 3. MACACUS ———?<br><i>Acephalocystis macaci.</i>  | 12. ANTILOPE QUADRICORNIS.<br><i>Echinococcus altricipariens.</i>  |
| 4. LEMUR MACO.<br><i>Cœnurus lemuris.</i>   | 13. ANTILOPE BUBALIS.<br><i>Pentastoma denticulatum.</i>           |
| 5. CANIS FULVUS.<br><i>Distoma conjunctum.</i><br><i>Trichosoma ærophilum.</i>            | 14. GAZELLA EUCHORE.<br><i>Cysticercus tenuicollis.</i>            |
| 6. VIVERRA MUNGOS.<br><i>Distoma compactum.</i>   | 15. CEPHALOPUS PYGMÆUS.<br><i>Pentastoma denticulatum.</i>         |
| 7. MUS RATTUS.<br><i>Tænia pusilla.</i>   | 16. OVIS TRAGELAPHUS.<br><i>Acephalocystis tragelaphi.</i>         |
| 8. MUS MUSCULUS.<br><i>Spiroptera obtusa.</i>   | 17. PHACOCHÆRUS ÆTHIOPICUS.<br><i>Cysticercus phacochæri.</i>      |
| 9. DASYPUS SEXCINCTUS.<br><i>Ascaris retusa.</i>  | 18. POTAMOCHÆRUS PENICILLATUS.<br><i>Cysticercus potamo-chæri.</i> |
|   | 19. DICOTELES TORQUATUS.<br><i>Strongylus paradoxus.</i>           |

## AVES.

- |  |  |
|--|--|
| 20. GYPS BARBATUS.<br><i>Ascaris depressa.</i>       | 23. TINAMUS ———?<br><i>Strongylus spiculatus.</i>                                      |
| 21. STRIX PERLATA.<br><i>Distoma æquale.</i>         | 24. PHASIANUS TORQUATUS.<br><i>Ascaris vesicularis.</i>                                |
| 22. AMADINA CUCULLATA.<br><i>Cestoidium amadinæ.</i> | 25. PHASIANUS ———?<br><i>Tænia infundibuliformis.</i><br><i>Trichosoma longicolle.</i> |

- |   |  |
|---|--|
| <p>26. PHASIANUS WALLICHII.<br/><i>Ascaris vesicularis.</i></p> <p>27. EUPLOCOMUS MELANOTIS.<br/><i>Ascaris vesicularis.</i></p> <p>28. ARDEA NYCTICORAX.<br/><i>Tænia multiformis.</i><br/><i>Filaria ardeæ.</i></p> <p>29. GRUS ANTIGONE.<br/><i>Eustrongylus papillosus.</i><br/><i>Filaria gruis.</i></p> <p>30. HÆMATOPUS OSTRALEGUS.<br/><i>Distomâ minutum.</i><br/><i>Tænia paradoxa.</i></p> | <p>31. ANAS OBSCURA.<br/><i>Tænia lanceolata.</i><br/><i>Tænia lævis.</i><br/><i>Ascaris tribothrioides.</i></p> <p>32. BERNICLA SANDWICHENSIS.<br/><i>Ascaris dispar.</i><br/><i>Spiroptera crassicauda.</i><br/><i>Trichosoma brevicolle.</i></p> <p>33. CHLOËPHAGA POLIOCEPHALA.<br/><i>Strongylus tubifex.</i><br/><i>Strongylus nodularis.</i><br/><i>Strongylus acuticaudatus.</i></p> |
|---|--|

REPTILIA.

- |   |   |
|---|---|
| <p>34. COLUBER BLUMENBACHII.<br/><i>Lingula colubri.</i><br/><i>Filaria col. blumenbachii.</i><br/><i>Nematoideum col. blumenbachii.</i></p> <p>35. COLUBER ———?<br/><i>Distoma boscii.</i><br/><i>Filaria col. americani.</i><br/><i>Nematoideum col. americani.</i></p> | <p>36. CALOTES VERSICOLOR.<br/><i>Filaria lacertarum.</i></p> <p>37. CHELYDRA SERPENTINA.<br/><i>Echinorhynchus inflexus.</i></p> <p>38. ALLIGATOR MISSISSIPIENSIS.<br/><i>Pentastoma oxycephalum.</i><br/><i>Distoma coronarium.</i><br/><i>Ascaris lineata.</i></p> |
|---|---|

TABLE of the Mature Entozoa, excluding the Acarine genus Pentastoma.

TREMATODA .....	{	<p>BILHARZIA * .....</p> <p>DISTOMA .....</p>	{	<p>magna.</p> <p>æquale.</p> <p>boscii.</p> <p>conjunctum.</p> <p>compactum.</p> <p>minutum.</p> <p>coronarium.</p> <p>lanceolata.</p> <p>lævis.</p> <p>multiformis.</p> <p>paradoxa.</p> <p>pusilla.</p>
CESTODA .....		TÆNIA.....		

\* Prof. Leuckart of Giessen very justly observes, in regard to this generic name, "Der Genusnamen Bilharzia kann nicht bleiben, da Diesing dafür bereits die Bezeichnung Gynæcophorus," etc.; yet I discovered my species (*magna*) Dec. 4, 1857, six months before Diesing read his "Revision" to the Vienna Academy. See "Bericht der nied. Thierte," in 'Archiv für Naturgeschichte,' viertes Heft, S. 136, 1860.

	}	SPIROPTERA .....	crassicauda.
			obtusa.
	}	ASCARIS .....	depressa.
NEMATODA .....	}	EUSTRONGYLUS .....	lineata.
	}	STRONGYLUS .....	tribothrioides.
	}	TRICHOCEPHALUS .....	papillosus.
	}	TRICHOSOMA .....	nodularis.
ACANTHOCEPHALA.....	}	ECHINORHYNCHUS.....	spiculatus.
	}		affinis.
	}		brevicolle.
	}		inflexus.

## DESCRIPTION OF PLATE XX.

- Fig. 1. *Strongylus tubifex*, ♀. Natural size.  
 Fig. 2. Tail of the same. Enlarged.  
 Fig. 3. *Strongylus nodularis*. Tail of male.  
 Fig. 4. The same. Caudal extremity of female.  
 Fig. 5. *Strongylus acuticaudatus*. Tail of female.  
 Fig. 6. The same. Caudal end of male.  
 Fig. 7. *Strongylus spiculatus*. Tail of female.  
 Fig. 8. The same. Tail of male.  
 Fig. 9. *Echinorhynchus inflexus*. Natural size.  
 Fig. 10. Head of the same. The *lemnisci* were twisted in the specimen here drawn. Enlarged.

Figures 3 to 8 inclusive are variously magnified, from 30 to 60 diameters linear.

6. CHARACTERS OF SOME NEW SPECIES OF AMERICAN PASSERES.  
 BY PHILIP LUTLEY SCLATER, M.A., Ph.D., SECRETARY TO  
 THE SOCIETY.

1. POLIOPTILA BUFFONI.

*Figuier à tête noire de Cayenne*, Buff. Pl. Enl. 704.—*Motacilla cærulea*, Gm.—*Polioptila leucogastra*, Sclater, P. Z. S. 1855, p. 12 (partim).

*Plumbea, subtus alba* : pileo toto, alis et cauda nigris : tectricum alarum majorum marginibus externis, secundariorum pogoniis externis, caudæ reatricibus duabus extimis et tertia ex majore parte albis : rostro et pedibus nigris, illius tomis pallidioribus.

Long. tota 4·0, alæ 1·9, caudæ 1·8, rostri a rictu 0·6 poll. et dec.

*Hab.* In Guiana et Nova Granada int.

*Mus.* P. L. S.

*Obs.* Similis *P. leucogastræ* ex Brasilia, sed minor, et rostro longiore, rectrice extima omnino alba, et harum secunda et tertia fere usque ad basin albis dignoscenda.

## 2. TROGLODYTES HYPAËDON.

"*Troglodytes aëdon*?" Sclater, P. Z. S. 1859, pp. 363, 372; Sclater et Salv. Ibis, 1859, p. 9.

Similis *T. aëdoni* ex America boreali, sed colore corporis subtus omnino brunnescenti-rufo; lateribus corporis saturatoribus, rufis, neque transfasciatis: crisso nigro transvittato.

*Hab.* In Mexico meridionali et Guatemala.

*Mus.* P. L. S.

This Wren, which I have heretofore not separated from *T. aëdon*, is certainly as distinct from that bird as *T. parkmanni* and other recognized species. It is in fact more nearly allied to *T. furvus* of South America than to the northern form; but differs also from the *T. furvus* in the deeper colouring of the under surface, the throat and belly of the latter species being medially of a nearly pure white.

## 3. BASILEUTERUS UROPYGIALIS.

*Olivaceus, capite cinerascete: superciliis, oculorum ciliis et corpore subtus pallide cervinis, ventre albescete: uropygio et caudæ dimidio basali pallide fulvis, hujus apice cinerascete olivaceo: rostro nigro, pedibus pallide carneis.*

Long. tota 4·5, alæ 2·7, caudæ 1·8.

*Hab.* In Brasilia.

*Mus.* P. L. S.

I have one specimen of this bird in my collection, received from M. Verreaux and marked "Brazil." It is most nearly allied to *B. semicervinus*, mihi (P. Z. S. 1860, p. 84), from Ecuador; but the uropygium and body beneath are much more lightly coloured; and the back is olive and head cinereous, almost as in *B. stragulatus*, with which it also nearly agrees in the coloration of the lower surface.

## 4. HYLOPHILUS INSULARIS.

*Supra olivaceus, pileo et dorso superiore ochraceo-brunnescentibus, dorso inferiore, alis extus et cauda viridescentibus: fronte, oculorum ambitu et corpore subtus pallide ochraceis, tibiis et crisso virescentibus: tectricibus subalaribus pallide citrinis: rostro corneo, subtus pallidiore, pedibus carneis.*

Long. tota 4·7, alæ 2·5, caudæ 1·9, tarsi 0·7, rostri a rictu 0·6.

*Hab.* In ins. Tobago.

I have a single specimen of this *Hylophilus*, presented to me by Sir William Jardine, by whom it was received from Mr. Kirk, amongst other birds collected in Tobago. It appears to belong to a well-marked though hitherto unnoticed species of this little group,—the bill nearly agreeing with that of *H. thoracicus*, though stronger and rather more arched, and the feet being likewise rather large and strong. The first primary is rather longer than in any other species of the genus that I am acquainted with, measuring 1·6 (in.) from the base of the wing to its extremity. In *H. thoracicus*, however, it is perhaps quite as long proportionately, the wing of *H. insularis* being generally larger than that of the former species. In its dull-olive

dress, brownish head, and pale buffy colour beneath, this bird is readily distinguishable from other members of the group.

#### 5. CHLOROPHANES GUATEMALENSIS.

*Chlorophanes atricapilla*, Sclat. & Salv. Ibis, 1859, p. 14, et 1860, p. 32.

Similis *C. atricapillo* ex America merid., sed differt colore corporis clariore viridi, capite nigro nucham totam occupante, et rostro magis crasso et elongato.

*Hab.* In Guatemala.

The differences between this and the southern bird appear to be so constant, although so small in amount, as to render a distinct name necessary; and I have therefore chosen one which indicates the locality of the bird.

#### 6. CHLOROPHONIA FLAVIROSTRIS.

*Psittaceo-viridis, remigibus alarum et rectricibus intus nigricantibus, illarum pogoniis externis cærulescenti-viridibus: subtus paulo dilutior, ventre medio et crisso flavis: rostro et pedibus flavis.*

Long. tota 4·0, alæ 2·3, caudæ 1·2.

*Hab.* In rep. Æquator.

*Mus.* P. L. S.

I have a single example of this *Chlorophonia* in my collection, received by Mr. Gould with other birds from Ecuador, from the eastern slope of the Andes, I believe. It appears to be the female of some undescribed species of this group. It may be readily distinguished from other species by its yellow bill and pale-yellow feet, and from *C. longipennis*, *C. frontalis*, and *C. viridis*, which are probably its nearest allies, by the absence of the blue round the eye.

#### 7. EUPHONIA VITTATA.

*Nigro-cæruleo-nitens: vitta frontali angusta fulvo-flavida: abdomine saturate fulvo-flavo, lateribus flavicantibus, tetricibus subalaribus albis, citrino tinctis: rectrice una utrinque extima in pogonio interno albo notata: rostro et pedibus nigris.*

Long. tota 4·2, alæ 2·4, caudæ 1·4.

*Hab.* In Brasilia.

*Obs.* Affinis *E. xanthogastræ*, sed fronte angusto aurescente, et cervice nigra in ventrem magis producta facile dignoscenda.

I have only a single specimen of this very distinct species of *Euphonia*, which, from its make, is evidently a Brazilian skin. I received it from M. Verreaux of Paris.

#### 8. TANAGRA SUBCINEREA.

*Flavicanti-olivacea, alis caudaque nigricantibus eodem colore limbatis; pileo cæruleo, margine postico ad nucham viridescente; lateribus capitis et loris nigris: subtus pure cinerea, subalari-*

*bus pallide flavis; crisso fulvescenti-flavo: rostro nigro, mandibulo inferiore plumbescente; pedibus carneis.*

Long. tota 6·75, alæ 3·2, caudæ 2·9.

*Hab.* In Venezuela et ins. S. Trinitatis.

This Tanager is a climatic form of *Tanagra cyanocephala* of Trans-andean Peru and Ecuador, and *T. auricrissa* of New Granada. It most closely resembles the former bird, but may be distinguished by the paler ashy colour of the lower surface, the duller yellowish-green of the crissum, and the less extent of the yellow on the under parts of the wings. The wings are also comparatively shorter, and there is less olivaceous colouring on the flanks of the Venezuelan bird. In the New Granadian *T. auricrissa* the under surface is tinged with blue, and the crissum is golden yellow.

#### 9. RAMPHOCELUS EPHIPPIALIS.

♂. *Coccineus: alis et cauda cum tibiis et subalaribus nigris: interscapulii totius plumis nigris obscuriore coccineo terminatis: rostro et pedibus nigris, illius mandibula inferiore ad basin alba.*

♀. *Simitis R. brasili et R. dorsalis fœminis.*

Long. tota 7·5, alæ 3·1, caudæ 3·1.

*Hab.* In ripis fl. Amazonum sup.

This *Ramphocelus*, of which I have specimens of both sexes, received by M. Verreaux from the Upper Amazon, is only distinguished from *R. brasilius* by its back between the wings being black, with the margins of the feathers only scarlet. In this respect it is further removed from *R. brasilius* than *R. dorsalis*, which is exactly intermediate between the two. M. Jules Verreaux informs me that all the specimens received from this locality were similarly marked; so that the variation, though small, seems to be constant.

#### 10. SALTATOR ISTHMICUS.

*Olivaceus, uropygio grisescente; alis fusco-nigris, extus olivaceo limbatis: cauda fusco-grisescente, rectricum apicibus albicantibus: subtus sordide albus olivaceo flammulatus, gula immaculata et cum ventre imo et crisso albicantibus: tectricibus subalaribus fulvescenti-albis, campterio flavido: rostro nigro, pedibus corylinis.*

Long. tota 7·0, alæ 3·5, caudæ 3·6.

*Hab.* In Isthmo Panama.

I have two specimens of this *Saltator* in my collection. I obtained them from Mr. John Bell, of New York, in 1856, who informed me that he shot them on his passage across the Isthmus of Panama on his return from California. The species is very closely allied to two others in my collection—one from Trinidad, which I take to be the *Saltator maculipectus*; and the other from Bogota, which I consider to be probably *S. striatipectus* of Lafresnaye. The three species, however, are so closely allied, that it is possible that one of M. de Lafresnaye's descriptions may be intended for the present bird.

The *Saltator isthmicus* may be distinguished from the Trinidad bird by the less pure white on the throat and belly, the more regular flammulations of the lower surface, and its uniform black bill. The Bogotan (*S. striatipectus*) is much darker on the breast and head, and has much less olivaceous in its coloration. The point of the bill is, likewise, pale in the latter bird.

## 7. ON THE AFFINITIES OF BALÆNICEPS.

By A. D. BARTLETT.

On appearing before you this evening with new evidence of the affinities of this bird, and in endeavouring to aid in settling a subject so long disputed and frequently discussed, I beg to refer, first, to the elaborate and carefully written paper by Mr. Parker, in which this bird, after the most careful examination and comparison of its bones, is considered to be an *Ardeine*.

I have, then, to observe, that from an entirely different course of examination, and by the consideration of its other structures, I have arrived at the same conclusion; and I hope, with the assistance of my friend Mr. Stewart, to prove to the satisfaction of our ornithological friends, that there is no longer any doubt in the matter.

The death of the survivor of the two birds brought home by Mr. Consul Petherick has afforded me the opportunity of making a more accurate examination of its structure, and this has led me to the discovery of two remarkable powder-down patches which, it will be remembered, I stated on a former occasion\* I had failed to find in the living bird.

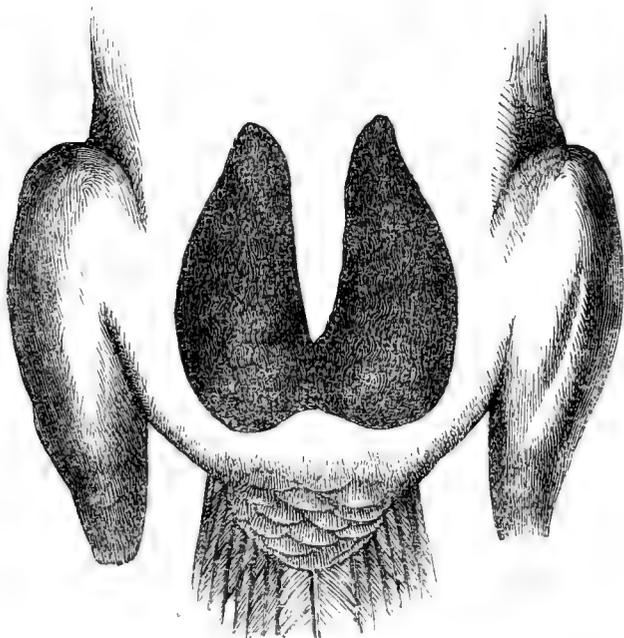
Upon removing the skin from the body of this bird, I was so struck by its close resemblance to the Herons, that I immediately killed a Heron and removed its skin also, in order to form a fair opinion by a close comparison of all the parts of these two birds. The exact form of the body and limbs was most remarkable; the structure of the hind toes (upon which so much stress has been laid) was alike, these turning backwards, forwards, or sideways in both species. The head and neck, however, of *Balæniceps*, when compared with the same parts of the Common Heron, present some very considerable differences. These differences consist, first, of the much larger head, and consequently stronger neck, in *Balæniceps* as compared with the Heron. Doubtless these modifications have reference to the food and the mode of obtaining that food. Many illustrations can be found of similar modifications; I may refer to one in the group under consideration, which results from the comparison of *Cancroma* with *Eurypyga*, and which presents, perhaps, the most extreme modification in the form of the bill in two birds of the same family.

As far as I was able to examine the viscera of the *Balæniceps*, I could discover nothing that would lead me to doubt its Ardeine affinities; the stomach, liver, intestines, &c., of the two birds appeared exactly to correspond in structure and arrangement.

\* See P. Z. S. 1860, p. 461.

Directing my attention to the skin of *Balæniceps*, I was surprised at finding on the lower part of the back, reaching from the end of

Fig. 1.



the scapulars to the base of the tail, two large, well-defined powder-down patches. The drawing (fig. 1) represents these two patches *in situ* on the body of the bird stripped of its feathers. These remarkable patches are dark-coloured on the inside of the skin, and on the outside the down is of extreme thickness, and the quantity of white or grey powder very great. This powder, when examined under the microscope, appears excessively oily, and will not mix with water. It is greasy to the touch, and is evidently produced by the growth of the down. It appears, in fact, to be the quill-shafts of the down broken up; or perhaps the down roots secrete this powder, which is distributed over the entire plumage, rendering the feathers impervious to water, in the same way that the oil-glands effect this in other birds. In this bird, however, the oil-glands are extremely small, not larger than the oil-glands of a Sparrow.

With reference to these patches, it is my intention to point out in the birds that I consider allied to *Balæniceps* the existence of these patches of down; and I may remark, that the attempt to arrange animals by such means is not new; as, for instance, in the case of the *Ruminants*, some of the genera are distinguished by peculiar patches of hair, which are said to be glandular, upon the legs, &c.; and again the *Viverridæ* are distinguished by the existence or otherwise of anal and other glands and pouches.

I therefore proceed to point out the species more or less allied to

*Balæniceps* that exhibit these singular structures. In the New World form (*Canceroma*) this structure appears to be most fully developed, this bird having four pairs of these powder-down patches,

Fig. 2.

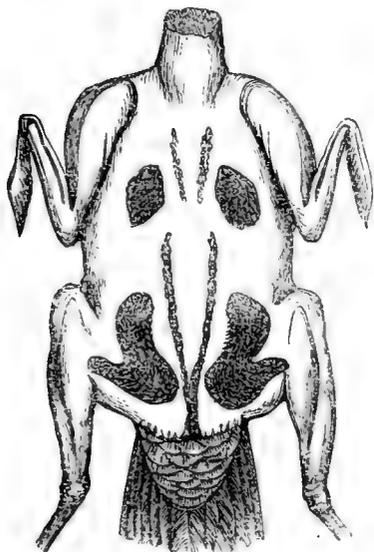


Fig. 3.



as shown in fig. 2, which represents the upper, and fig. 3, which gives the lower surface of the body of this bird ; while in the Old World form (*Balæniceps*) one pair only exist, as we have seen in fig. 1.

It is worthy of notice, that the true Herons, which inhabit both the Old and New World, and which have generally been regarded as the type of the group, have three pairs of these patches ; the little and certainly aberrant form of Heron, *Eurypyga*, has only one pair of these down patches ; while intermediate between this bird and the Herons come the Bitterns, in which two pairs of these patches exist\*.

By these remarks one is naturally led to observe the often-noticed correspondence of forms in the Old and New World ; as, for instance, the Ostrich of Africa represented by the Rhea of America, the Camel of the Old World by the Llama of America, the Lion by the Puma, and many other similar representations.

In the work on 'Pterylographic,' published by Ch. L. Nitzsch, the author, who evidently has paid great attention to the subject, says, that "these powder-down patches are found (but in a much

\* Having had many opportunities of studying the habits of the living examples of *Eurypyga* and *Botaurus*, I have observed a striking resemblance in these birds, particularly in the drooping and spreading out of the wings, in which position the beautiful markings upon every feather are finely displayed. I have so frequently seen this attitude assumed by both these birds, that I am satisfied it was not merely an accidental thing.

smaller degree) in the genus *Tinamus*\*, one or two Parrots, and also in some of the Birds of Prey." I have not, however, met with them in any group except the *Ardeæ* and their allies. I can assert most positively that no traces of these patches exist in the Pelicans, Storks, or Cranes. I have also taken considerable trouble with *Scopus*. This bird is considered by Prof. Reinhardt to be closely allied to *Balæniceps*. I cannot find anything to justify such a belief; the skins and skulls of the two birds are so entirely different, that it is useless to enter into any further details respecting them.

There is one thing, however, that I wish to remark, and I do so with considerable uneasiness lest I should be accused of casting a doubt upon the veracity of the gentleman to whom we are indebted for the first living specimens of this rare bird; and this consideration would have prevented my making the remark, had not my great desire been to call attention to the subject in the hope of obtaining a truthful explanation of what appears to me inexplicable—I refer to the statement, made by Mr. Petherick, that *Balæniceps* runs about in search of food immediately after it is hatched. If this is true, it is one of the most extraordinary facts I have yet met with.

---

April 9th, 1861.

Dr. J. E. Gray, F.R.S., V.P., in the Chair,

The following extracts from a letter addressed to the Secretary by Robert Swinhoe, Esq., Corresponding Member of the Society, dated British Consulate, Amoy, Jan. 1st, 1861, were read to the meeting:—

"I returned a few weeks ago from the north of China, where I was attached to Sir Hope Grant as Interpreter. Through the kindness of Major Sarel of the 17th Lancers, attached as Aide-de-camp to Sir Hope Grant, I was enabled to procure three skins of a Deer found in herds in the Imperial Parks of the Summer Palace. The three deer are apparently first, a two-year-old buck; the second, a one-year-old buck; and the third a doe. I skinned them, and preserved their skulls. They are, I think, *Cervus wallichii* of Pallas, from Eastern Siberia; and I trust will form an acceptable acquisition to the collection of the Zoological Society. Major Sarel also procured the heads of three fine bucks, which he has sent to his brother-in-law, Edmund Bury, Esq., of Manchester, and which will shortly be

\* Since writing the foregoing I have examined *Tinamus*. The structure referred to by Nitzsch appears to differ so widely from the down-patches of the Ardeine family, that I shall describe it in another paper upon this subject, which I hope to have ready shortly.





put into the hands of Mr. Leadbeater for preservation. If, therefore, the Society are anxious to compare the skins I send with the heads of older and finer animals, they will find no difficulty in so doing by applying to Mr. Leadbeater.

“I send also in the same box the skin of a Mole (perhaps *Talpa leucura*, Blyth) from Pekin.

“A Hedgehog, which I take to be new, is also from Pekin. But this species is also found in Shanghai, and has lately been captured at Swatow.

“In a bottle, preserved in spirits, you will find a small Mouse and a Bat, besides several Snakes, Lizards, and Frogs.

“All these specimens have been fastened in a tinned box, and shipped on board the ‘Harkaway’ bound for London. I enclose you the mate’s receipt.”

Extracts were also read from a letter addressed to Mr. T. Rupert Jones by Mr. S. R. Pittard, containing remarks relative to the flight of Albatroses (*Diomedea*) and other oceanic birds, as observed during his voyage to Australia.

The following papers were read:—

1. LIST OF MAMMALIA, TORTOISES AND CROCODILES COLLECTED BY M. MOUHOT IN CAMBOJA. BY JOHN EDWARD GRAY, F.R.S., V.P.Z.S., F.L.S.

(Plate XXI.)

M. Mouhot having sent to Mr. S. Stevens a number of Mammalia and other animals from Camboja, a series of them has been secured for the British Museum Collection.

I hasten to lay before the Society a list of all the specimens, and the varieties that they present, with a description of the species or varieties which appear to be new to science.

#### MAMMALIA.

There are eight specimens of the Long-armed Ape (*Hylobates*). They differ considerably in colour, and yet offer some peculiarities which I have not observed in specimens from other parts of India or the Asiatic islands, so that I am induced to believe them to be a separate species or local variety. M. Mouhot is inclined to regard them as varieties or states of the same species; as he observed that they were all found in company on a small island near Camboja.

1. The oldest specimens, whether they are black with a more or less grey back and white hands, or a white with a more or less long black spot on the chest, generally have a large black spot on the crown of the head, circumscribed by a pale edge; some of the white examples have white and others black whiskers.

2. The two younger specimens are yellowish white, without any black, not even the spot on the head; but this may be only on account of their youth.

From this spot on the forehead I am inclined to distinguish this species or variety by the name of *H. pileatus*, though this is not quite a distinctive mark, as both *H. leucurus* and *H. agilis* have the crown more or less black.

*HYLOBATES PILEATUS.* (Pl. XXI.)

*Male.*—Black; back of head, back of body, and front hind legs greyish; forehead and circumference of the black spot on the crown paler grey; hands and tuft of long hair round the organ of generation white.

The three specimens in this state are all nearly of the same size, and appear to be adult. They only vary slightly in the size of the coronal spot, and in the extent of the white colour on the hands.

*Female.*—White; back brownish white, slightly waved; a large ovate spot on the crown, and a very large ovate blotch on the chest, black.

These specimens are all of one size, and appear to be adult, and are probably female; three have the teats well-developed. They vary in the size of the black chest spot, and in the colour of the whiskers, thus:—

*a—b.* White; spot on the chest moderate, reaching only half-way down the abdomen; whiskers on side of face white.

*c.* Brownish; spot on chest larger, reaching further down the abdomen; sides of the face black; a few black hairs on the throat.

*d.* Brownish; side of the face, under the chin, and the whole of the throat, chest, and belly black; teats well-developed.

*Young.*—Uniform dirty white, without any black spot on chest or head.

*PTEROPUS EDWARDSII*, Geoffroy, Ann. Mus. xv. p. 92.

*Hab.* Camboja.

A single specimen.

*LEOPARDUS VIVERRINUS*, Gray, List Mamm. B.M. p. 43, 1843.

*Hab.* Camboja.

Three specimens.

*PARADOXURUS PALLASII*, Gray, P. Z. S. 1832, p. 67.

*Hab.* Camboja.

Two specimens, adult and young.

*VIVERRA MALACCENSIS*, Gmel.

*Hab.* Camboja.

A single specimen.

*HERPESTES RUTILUS.*

Grisled chestnut-brown, variegated with black and white rings on the hairs; the head and limbs darker chestnut, with scarcely any and very narrow white rings; lips and throat, and under part of the

body, uniform duller brown, not grised; ears brown, the nape with longer hairs, forming a broad short crest.

*Hab.* Camboja.

A single specimen.

Browner than any other Indian *Herpestes* I have seen.

*PTEROMYS MOMOGA?*

*Hab.* Camboja.

One specimen.

This species is very like *Pteromys momoga*, Temm. Faun. Japon. Mam. t. 14.

There are five specimens of a Squirrel in the collection; they appear to be distinct from any we have before received; but they offer four very distinct varieties, and it is not easy to decide if the animal may not itself be a local variety of some other Indian species.

*SCIURUS SPLENDENS.*

All the specimens are bright red bay.

Var. 1. All over dark and very intense red bay, with a white spot on each side of the base of the tail. Two specimens, nearly identical in colour and size.

Var. 2. Top of the head and tail, like var. 1, dark and very intense red bay; side of the back, under sides of the body, and tip of the tail paler red bay, without any white spot at the base of the tail. A single specimen.

Var. 3. Uniform pale bay, like the side of var. 2; tail and middle of the back rather darker and brighter; tail without pale tip or white basal spot. A single specimen.

Var. 4. Crown, middle of the back and tail dark intense red bay; throat, chest, and under side paler red bay, like vars. 2, 3; cheeks, shoulders and thighs, and outsides of the fore and hind legs brown, grised with yellow rings on the hairs; side of the body rather greyish red. A single specimen.

This last state would almost lead one to suppose that this Squirrel may be only a variety of some other species.

*SCIURUS JAVENSIS*, Schreb.

*Hab.* Camboja.

Three specimens, one male and two females, very nearly alike in size and colouring.

*SCIURUS MACCLELLANDII*, Horsf. Proc. Zool. Soc. 1839, p. 152.

One specimen.

*SCIURUS SIAMENSIS*, Gray, Proc. Zool. Soc. 1859, p. 478.

*Hab.* Siam.

Two specimens, none now sent.

*SCIURUS MOUHOTII.*

Grised grey-brown, with pale rings; lips, chin, throat, and un-

der side of body and inside of limbs white; the upper part of the sides with a longitudinal black streak, edged above and below with a narrow white line; tail blackish whitish washed, hairs elongate, brown, with two broad black rings and a white tip; ears simple, rounded.

*Hab.* Camboja.

A single specimen.

The species differ from most of the Squirrels of the size, in the three streaks being on the upper part of the back, and in the dark colour between the two colours of the upper and under surface.

*RUSA PERONII*, Gray, Cat. B. M. p. 211.

*Cervus peronii*, Cuvier.

*C. kuhlii*, S. Müller.

*Hab.* Camboja.

There is a pair of shed horns, evidently of an adult specimen, in the collection; they are small and slender, and similar to the horns of *C. kuhlii* in the Museum Collection, which were received from Holland. They may be the horns of an allied but distinct species; for it is quite impossible to distinguish deer by the horns alone, they vary so much in specimens of the same species.

*RUSA* — ?

*Hab.* Camboja.

There is a single horn of the right side of the head, which has been cut from the base, which is very distinct from any horn that I know. It is very thick and strong, curved, covered with very large grooves and warts, and with a short, conical, thick branch, bending rather inwards on the front of the inner side quite at the base.

*CERVULUS CAMBOJENSIS*.

*Hab.* Camboja.

There are the forehead covered with hair and the horns of a Muntjack in the collection. It is very much larger than any specimen of that genus in the Museum Collection, and is probably a distinct species.

The horns are thick, nearly straight, with a short, thick, recurved branch on the outer part of the front side near the base, and one of them has a somewhat similar callosity on the hinder side on the same level. Hair of forehead very rigid, close pressed, dark brown, with narrow yellow rings.

*TRAGULUS AFFINIS*, Gray, List of Mamm. Brit. Mus. p. 173, 1843.

Not yet described. Similar to *T. javanicus* in colour, but rather smaller and much paler, and the side of the neck similar in colour to the side of the body; the belly is white, with a brown streak on each side of the central line; the head is smaller. It is larger than *T. kanchil*, very much paler, and the neck is not blacker and grised. A specimen of the species has been in the Museum as above

named for many years : it is said to have come from Singapore ; but that probably was only the port of transit. It may be only a small pale local variety of *T. kanchil*.

Six specimens, adult, all exactly similar ; one young.

*Sus* — ?

*Hab.* Camboja.

There are two lower tusks of this genus in the collection, indicating the existence of a species of the genus ; one is very large and thick, the other is elongate and slender. They may be the tusks of the two sexes.

MANIS PENTADACTYLA, Linn.

*Hab.* Camboja.

Two specimens, adult and half-grown.

#### REPTILIA.

TESTUDO ELONGATA, Gray.

One specimen, half-grown.

The shields are yellow, with an irregular black ring round the areola ; the disk of the areola is sometimes varied with a few roundish black spots ; the sternal shields are yellow, with an irregular square subcentral blotch covering part of the areola.

GEOCLEMYS MACROCEPHALA, Gray, Proc. Zool. Soc. 1859, p. 478. t. xxi.

*Hab.* Siam and Camboja.

Two specimens, one adult, other young.

The adult is nearly twice as large as the specimen first described ; the three keels are distinct, but very blunt, and the vertebral shields are oblong, transverse, but rounded at the angles ; the margin of the shell is yellow ; the under side yellow, with a more or less large black blotch on each shield.

The young shell is brown, with a narrow, pale-yellow margin ; the keels are very distinct ; the central one is very broad, and wider on the hinder parts of each shield ; the lateral keel ends with the third costal plate, and is at the end bent in towards the central line ; the under-side is dark brown, with a white streak down the centre, and a white streak on the margin ; and on the keel, which separates the flat parts of the sternum from the shelving part of the sides, that shelving part is high, much higher than in the adult shell.

GEOEMYDA SPINOSA, Gray, P. Z. S. 1834.

*Hab.* Camboja.

Three specimens in different ages, from young to nearly adult. They are all marked with radiating brown lines on each of the sternal and the under side of the marginal shields, which are widest in the youngest and narrowest in the most adult specimens. The older specimen alone has these lines on the dorsal and upper side of the

marginal shields; the areolæ being plain brown, as in the younger specimen.

*EMYS CRASSICOLLIS*, Gray, Cat. Tort. Croc. Brit. Mus. p. 16, 1844.

*Hab.* Camboja.

Two specimens, adult and young.

As in *Geoemyda macrocephala*, the sternum of the young specimen is rather higher than the adult, and the centre is separated from the side by a distinct marginal keel, which is not so visible in the more adult specimen.

*CISTUDO AMBOINENSIS*, Gray, Syn. Cat. Tort. Croc. Brit. Mus. p. 30, 1844.

*Hab.* Camboja.

One specimen, adult, of the high, oblong variety.

The sternum is white, with an irregular black spot on each shield.

*CROCODILUS POROSUS*, Schneid.

*Crocodylus porosus*, Gray, Cat. B. M. p. 58.

*C. biscutatus*, Cuvier, Oss. Foss. v. 65. t. 2. f. 8.

*Hab.* Camboja.

There is a young specimen of this species, rather more than 4 feet long, in the collection. It has no appearance of the ridges on the centre of the hinder part of the skull, on which *Crocodylus siamensis*, Schl., and *C. galeatus*, Cuvier (Oss. Foss. v. t. 1. f. 9), is founded; indeed it is very doubtful if these were not accidental malformations in the skull figured.

## 2. REMARKS ON THE BREEDING OF THE LARGER FELIDÆ IN CAPTIVITY. BY A. D. BARTLETT.

(Plate XXII.)

The Lion (*Felis leo*) appears to breed more freely than any other species of *Felis*, and the number of young at a birth is greater, not unfrequently four and sometimes five being produced in a litter. It is remarkable that these animals breed more freely in travelling collections (wild-beast shows) than in zoological gardens; probably the constant excitement and irritation produced by moving from place to place, or change of air, may have considerable influence in the matter.

The Tiger (*Felis tigris*) has rarely bred in confinement; but there are several well-authenticated instances of the female Tiger breeding with the Lion. The hybrids lived, and in due time arrived at maturity.

Animals of this mixed breed have been exhibited in a travelling menagerie kept by Mr. Atkins; the appearance of the animals at once bespoke their mixed origin.

I have more than once met with instances of the male Jaguar (*F. onca*) breeding with a female Leopard (*F. leopardus*): these hybrids also were reared recently in Wombwell's well-known travelling col-





lection. I have seen some animals of this kind bred between a male black Jaguar and a female Indian Leopard; the young partook strongly of the male, being almost black.

The Leopard is not unfrequently bred in captivity; many have been bred and reared in the Society's Gardens, and elsewhere.

The Puma (*F. concolor*) has bred frequently in the Society's Gardens. This species appears to produce generally two only at a birth, in some cases only one: they rear their young without difficulty.

The Ocelot (*F. pardalis*) has also bred two or three times in the Society's Gardens.

As far as I am able to ascertain, the period of gestation in the foregoing species is *sixteen weeks*. The young of some of the species bear a great resemblance to each other; thus, for instance, the young of the Lion is indistinctly spotted all over; the young of the Puma is also spotted with large and well-marked patches, which the accompanying figures (Plate XXII.), drawn by Mr. Wolf from young Pumas born in the Gardens, well exhibit.

The Cheetah (*Felis jubata*) never to my knowledge has bred in England; Dr. Günther, however, informs me that this species has bred in the Gardens in Frankfort. From all that I have experienced with reference to this beautiful species, I consider it one of the most difficult of the family to keep, and consequently the chances of its breeding are rare. This animal is generally gentle, timid, and very excitable. I am inclined to think the want of sufficient space and exercise, together with over-feeding, are the cause of convulsions and fits, to which this species is liable; I have witnessed the death of two or three that have died from excitement after a full meal.

The young of the Tiger is striped like the adult, but of course less distinctly. The young Leopard also resembles the adult in its markings. Not only in the large Cats, but in all the smaller species of the genus *Felis*, the spots, stripes, or markings are always present in the young of those species that are so marked in the adult state; and, as far as my knowledge extends, the young of all (except the *domestic* cat) exhibit traces of spots or other markings, although they disappear in the adult animals.

A very extraordinary malformation or defect has frequently occurred among the lions produced during the last twenty years in the Regent's Park. This imperfection consists in the roof of the mouth being open—the palatal bones do not meet, the animal is therefore unable to suck, and consequently always dies. This abnormal condition has not been confined to the young of any one pair of lions, but many lions that have bred in the Gardens, and not in any way related to each other, have from time to time produced these malformed young, the cause of which appears to me quite unaccountable.

Since writing the above, I have the pleasure of adding that the Society's collection has been enriched by a litter of cubs from the female Mexican Jaguar (*Felis hernandezii*) and the male of the common Jaguar (*Felis onca*). I may add at the same time, that the Tigress in the Society's Gardens is now in young.

## 3. ON A NEW SPECIES OF THE FAMILY BOIDÆ.

BY DR. ALBERT GÜNTHER.

(Plate XXIII.)

## PELOPHILUS FORDII.

Head rather narrow; neck slender; body thick, compressed; tail conical, tapering, prehensile. The anterior part of the head is covered with regular shields, symmetrically arranged, the posterior part from the orbits is scaly. There are four pairs of frontal shields, two small shields being intercalated between the posterior pair; then follows a large square vertical shield, the largest of all the shields of the head, situated between the superciliaries. The nasal opening is small, between three shields—namely between the two nasals and the anterior frontal. Three or four loreals, two anterior and five posterior oculars. Thirteen upper labials, the sixth, seventh and eighth entering the orbit; none of them grooved. Pupil vertical, elliptical. Scales smooth, in twenty-eight series on the posterior part of the neck, and in thirty-three on the middle of the body. Ventral shields rather narrow, 253; anal 1; subcaudals entire 70.

The ground colour is a reddish olive, more yellowish inferiorly; a reddish brown streak from the nasal shield through the orbit to the angle of the mouth. A series of about eighty transverse reniform spots from the head to the end of the tail; each spot light reddish brown, edged with dark brown. Another series of similar, but smaller and irregular spots along each side; belly nearly uniform.

Length of the head  $\frac{2}{3}$  inch, of trunk 22 inches, of tail 4 inches.

This species comes from Western Africa, but I am not aware from what particular part. I have named it after Mr. Ford, whose merits in herpetology are well known by his truly artistical drawings.

## 4. ON A NEW SPECIES OF FISH OF THE GENUS GERRES.

BY DR. A. GÜNTHER, FOR. MEMB.

(Plate XXIV.)

## GERRES LONGIROSTRIS, Rapp. (Pl. XXIV.)

D.  $\frac{9}{11}$ . A.  $\frac{3}{8}$ .

The height of the body is one-half of the total length (without caudal). Præorbital and præoperculum not serrated. *Dorsal fin not notched*; the spines are moderately strong; the length of the second being four-sevenths of that of the head, or two-fifths of the depth of the body. The second and third anal spines are nearly of the same strength, and considerably shorter than those of the dorsal fin. Silvery, with darker stripes along the series of scales.

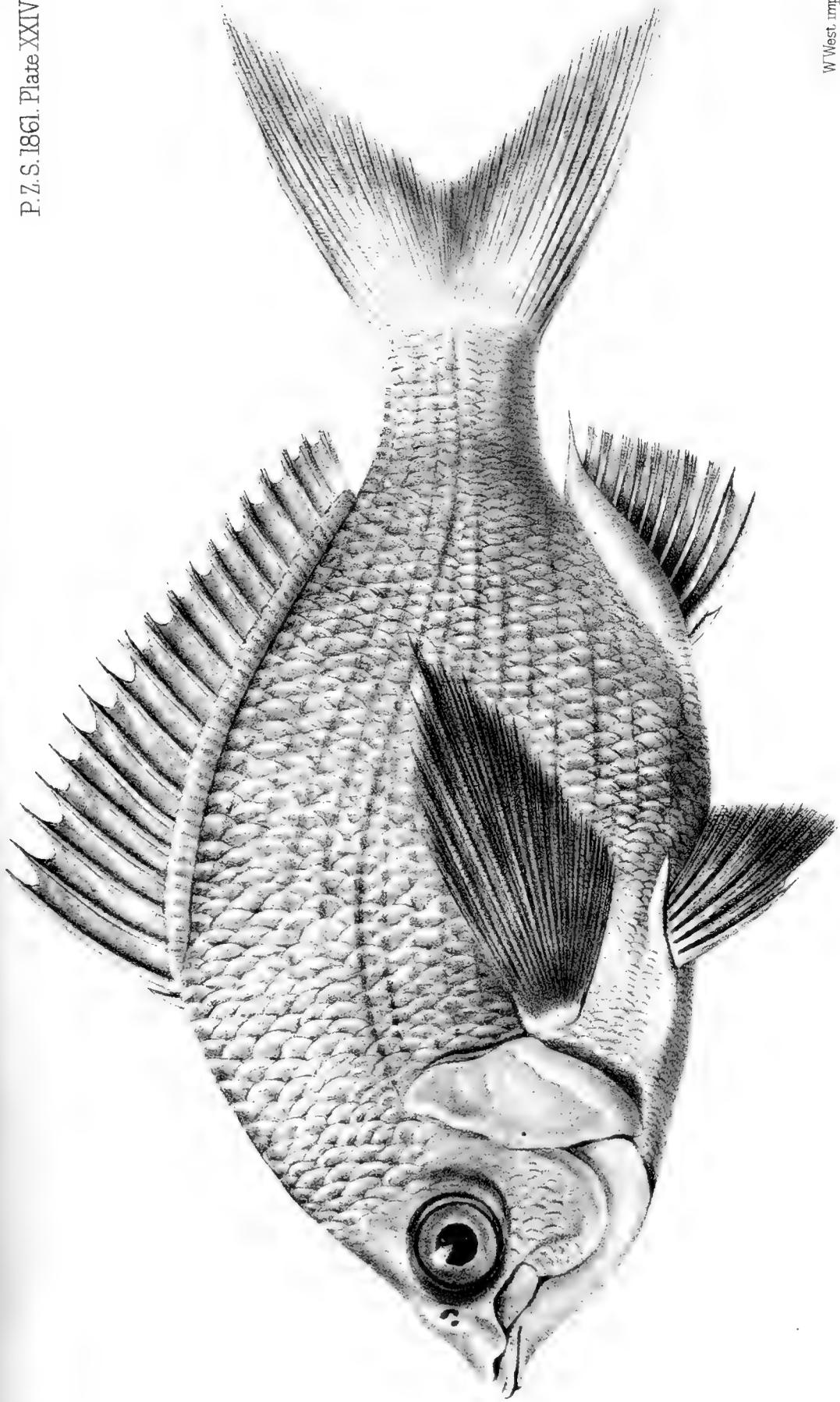
*Hab.* Cape of Good Hope.

This species is distinguished from all the others by the dorsal fin, which has the upper margin even, without any indication of a notch. It has been established by Professor W. von Rapp from specimens in



PELOPHILUS FORDII.







the Museum of Tübingen, and to him I am indebted for the accompanying fine drawing (Pl. XXIV.).

5. DESCRIPTIONS OF A NEW GENUS AND SOME NEW SPECIES OF SHELLS FROM THE COLLECTION OF HUGH CUMING, ESQ. BY H. ADAMS, F.L.S.

Genus OCANA, H. Adams.

*Operculum costa spirali convexa, granosa instructum; valde perforatum; margine externo simplici.*

*Testa turbinata, solida, lævis, imperforata; spira brevis, conica; apertura subcircularis, latior quam longior; labium planatum, excavatum, antice subproductum, callo tenui extenso.*

Operculum with a convex, granular spiral rib; axis deeply perforated; outer edge simple.

Shell turbate, solid, smooth; axis imperforate; spire short, conical; aperture subcircular, wider than long; inner lip flattened, excavated, scarcely produced anteriorly, with an extended thin callus.

Ex. *Ocana helicina*, H. Adams.

*Turbo helicinus*, Born.

*Turbo cidaris*, Gmel.

When this species was included by my brother and myself in *Sarmaticus*, to the shells of which genus it bears considerable resemblance, the operculum was unknown to us. I have, however, recently had an opportunity of examining it, and find it to be entirely different from that of *Sarmaticus*. It approaches more nearly that of *Callo-poma*, but it is without submarginal ribs. The species is from the Cape Colony, which is also the locality of the two known species of the former genus.

Genus PHYSA, Drap.

Subgenus AMERIA, H. Adams.

*Testa anfractibus postice planatis, et angulatis vel carinatis; spira brevi, depressa.*

Shell with the whorls flattened, and angulated or carinated at the posterior part; spire short, depressed.

1. PHYSA (AMERIA) CARINATA, H. Adams.

*P. testa subovata, tenui, pallida flavo-fusca; spira brevissima, apice planato; anfractibus 3, postice planatis et valde carinatis; apertura subovati, plica columellari mediocri.*

Shell subovate, thin, pale yellowish-brown; spire very short, the apex flat; whorls three, flattened and strongly carinated posteriorly; aperture subovate, columellar plait moderate.

Long.  $5\frac{1}{2}$ , diam.  $3\frac{1}{4}$  lin.

*Hab.* Boyne River, Australia.

2. *PHYSA* (*AMERIA*) *TRUNCATA*, H. Adams.

*P. testa truncato-ovali, pellucida, fragili, pallido-fusca; spira truncata; anfractibus 3, valde carinatis; apertura subovali, peritremate continuo; plica columellari obsoleta.*

Shell truncate-ovate, translucent, fragile, pale brown; spire truncate; whorls three, strongly keeled; aperture subovate, peritreme continuous; columellar plait obsolete.

Long. 4, diam.  $2\frac{1}{2}$  lin.

*Hab.* Calliope River, Australia.

3. *PHYSA* (*AMERIA*) *OBESA*, H. Adams.

*P. testa truncato-ovata, brevis, tenui, fusca; spira brevissima; anfractibus 3, postice carinatis et planatis; apertura subovali, lata, peritremate continuo; plica columellari obsoleta.*

Shell truncate-ovate, short, thin, brown; spire very short; whorls three, keeled and flattened posteriorly; aperture suboval, wide, peritreme continuous; columella fold indistinct.

Long.  $3\frac{3}{4}$ , diam.  $2\frac{1}{2}$  lin.

*Hab.* Fitzroy River, Australia.

4. *PHYSA* (*AMERIA*) *CUMINGII*, H. Adams.

*P. testa ovali, tenui, pallido-fusca; spira brevis, anfractibus 4, postice angulatis et planatis; apertura subovata, peritremate continuo; plica columellari mediocri.*

Shell ovate, thin, light brown; spire short; whorls four, angulated and flattened at the posterior part; aperture subovate, peritreme continuous; columellar plait moderate.

Long. 8, diam.  $5\frac{1}{4}$  lin.

*Hab.* Port Essington, Australia; New Zealand.

5. *PHYSA* (*AMERIA*) *MÆSTA*, H. Adams.

*P. testa oblique ovali, tenui, olivaceo-fusca; spira mediocri; anfractibus 5, postice carinatis et planatis; apertura ovali, plica columellari conspicua.*

Shell obliquely ovate, thin, olive-brown; spire moderate; whorls five, carinated and flattened posteriorly; aperture oval, columellar plait distinct.

Long. 7, diam.  $5\frac{1}{2}$  lin.

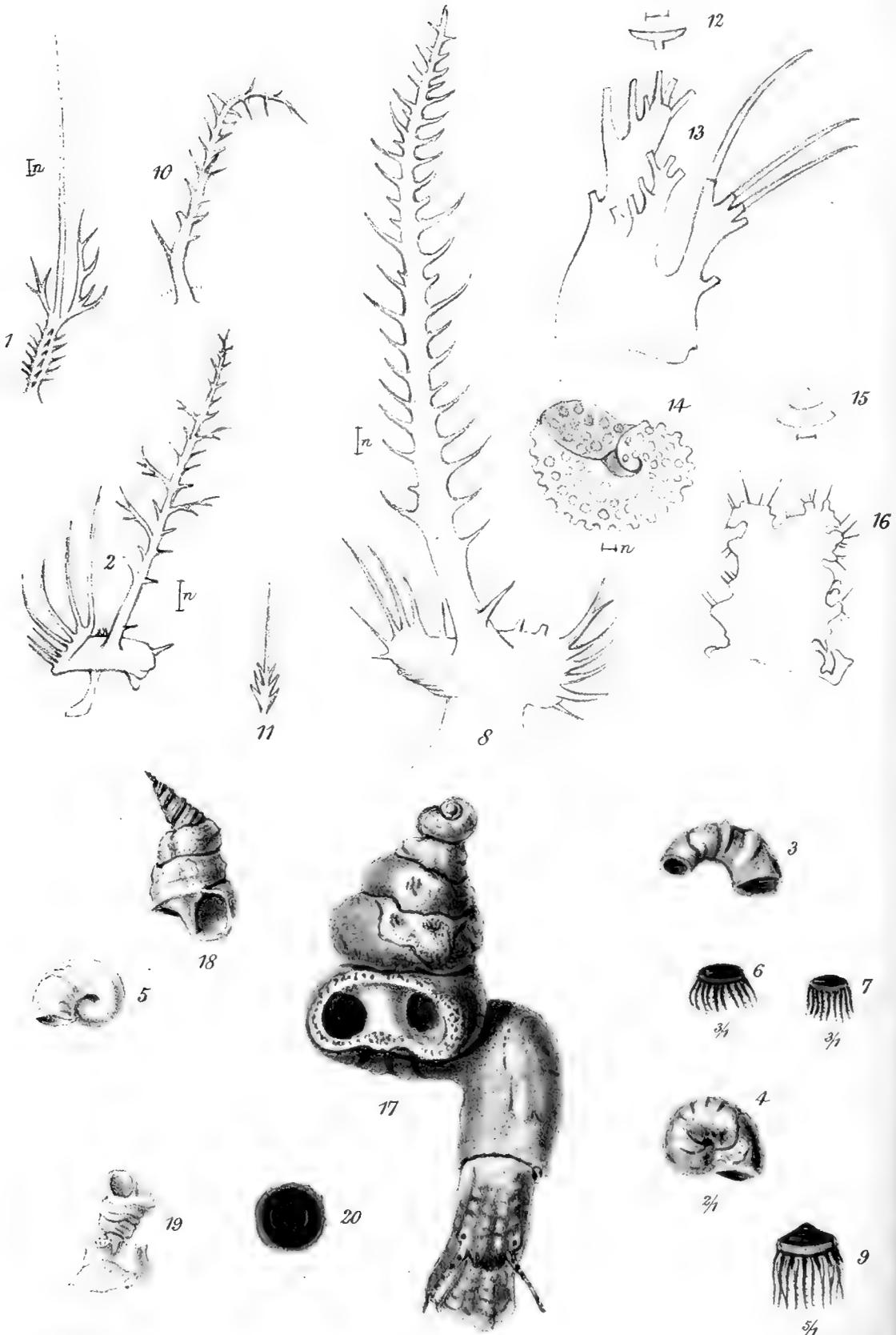
*Hab.* New Zealand.

Genus *PHYSOPSIS*, Krauss.*PHYSOPSIS* *JUKESII*, H. Adams.

*P. testa subglobosa, tenui, albida; spira brevis, obtusa; anfractibus 4, convexis; apertura subovali, peritremate continuo; columella recte truncata.*

Shell subglobose, thin, white; spire short, obtuse; whorls four,





Gen. West.

Structure of the Vermetidæ.

W. West, imp.

convex; aperture subovate, peritreme continuous; columella sharply truncated.

Long. 3, diam. 2 lin.

*Hab.* Port Essington, Australia.

This species was discovered by Mr. Jukes at Port Essington. The only other species of the genus known is that described by Krauss from Port Natal.

### Genus PLANORBIS, Guett.

#### Subgenus HELISOMA, Swains.

#### PLANORBIS (HELISOMA) LAUTUS, H. Adams.

*P. testa subovata, tenui, pari altitudine et latitudine, pallide alba, supra profunde et anguste umbilicata, infra planata; anfractibus 3, celeriter crescentibus, convexiusculis, superne angulatis et angustis, subtus carinatis, subtilissime striis decussatis; apertura subobliqua, subovata, supra anfractum penultimum surgente, peritremate continuo.*

Shell subovate, thin, the height equalling the width, yellowish-white, deeply and narrowly umbilicated above, flat below; whorls three, rapidly increasing, rounded, angulated and contracted above, carinated below, decussated by fine striæ; aperture slightly oblique, subovate, extending above the penultimate whorl, peritreme continuous.

Diam. 2 lin.

*Hab.* New Orleans.

#### Subgenus ADULA, H. Adams. *presc*

*Testa anfractibus convexis et numerosis, supra profunde umbilicata, infra convexa; apertura campanulata.*

Shell with the whorls rounded and numerous, deeply umbilicated on the upper, and convex on the under side; aperture campanulate.

*Ex. P. (Adula) multivolvis, Case.*

This species of *Planorbis*, which is one of the few having campanulate apertures, is so different from the rest in the whorls being numerous and slowly increasing, and in the spire being depressed considerably below the under side, that it appears desirable to separate it from them.

## 6. REVIEW OF THE VERMETIDÆ. BY OTTO A. L. MÖRCH (OF COPENHAGEN). (PART I.)

(Plate XXV.)

The shells of the *Vermetidæ* are at once to be distinguished from those of the *Serpulæ* by the presence of a spiral nuclear shell and of concave smooth interior septa; but these parts are often lost or con-

cealed, and it is then exceedingly difficult to decide with certainty whether the shell is the production of an Annelid or of a Molluscous animal.

If the shell is formed of a solid matter strongly sculptured with longitudinal grooves or scales, or of a brownish colour, it is certainly formed by a *Vermetus*; but if the shell is of a soft earthy matter, feebly longitudinally grooved, it is doubtful to which subkingdom it belongs.

The shells of the *Serpulidæ* have an anal opening (except the genus *Cymospira*), and appear only to be composed of two layers, the *Vermetidæ* having three.

There is a striking analogy between the *Vermetidæ* and *Ostreidæ* in respect of colours, sculpture, and growth. As in the latter family, the sculpture of the *Vermetidæ* is much influenced by the bodies to which they attach themselves, the surface often showing the cast of the sculpture of a coral\* or another shell.

I have convinced myself by the comparison of numerous specimens, chiefly of *Siphonium nebulosum* and *Vermetus decussatus*, Gm., that one and the same species may vary, from being strongly grooved and scaly to being quite smooth and polished.

The form and growth are not less variable; the same species being found nearly regularly spiral, top-shaped, planorbiform, or as a nearly straight tube. The same species is sometimes affixed and solitary, sometimes free and agglomerated, imbedded in mud (*Spiroglyphus glomeratus*, Biv.). Some species (*Siphonium nebulosum*, Dill.) are affixed during the greater part of their lives, and seem then, like *Cæcum*, to "decollate" the shell and live afterwards free in the mud; perhaps this may have relation to the sexual functions †.

The thickness of the shell may vary from being thin and nearly pellucid to being very thick and incrustated; if the shell be laterally affixed, the dilated angular sides are filled out with a solid calcareous mass (Chenu, Illustr. pl. 2. f. 2).

In the interior of several species (*Petalocoynchus*) are found some very long lamellæ, generally regarded of generic value. I have reason to think that these lamellæ are dissolved with age, like the teeth of some species of *Pupa* ‡; or perhaps they are of a sexual nature, like the interior cup of *Beguina* (*Thecalia*) *concamerata*, Chem., from the Cape of Good Hope, which is said to contain the fry.

Daudin and Marcell de Serres thought they had discovered a generic character in the habit possessed by some Wormtubes of burrowing in other shells. Although this character is more developed and constant in some species than in others, it is scarcely of specific value, and is common to nearly all young *Vermeti*. Vertically growing species often show the same dissolving power in removing parts

\* Seba, 'Thesaurus,' vol. iii. t. 93. f. 9, and *Ostrea cumingii*, Dkr. in Philippi Abbildungen, t. 1.

† Siebold (Lehrbuch der vergleich. Anatomie, p. 355) denies the presence of an exterior penis; but Rüppell (Atlas, t. 11. f. 3) has figured a species with an exert male organ. It appears that the large fusiform cells containing undeveloped spermatozooids (Siebold, l. c.) are Spermatophores.

‡ V. Martens, Ueber *Pupa Wienlandi* Kur. Mal. Blätter. 1859, p. 209.

of neighbouring tubes which stop their development. *Saxicava* and other genera of burrowing Bivalves afford sufficient examples of the generic and specific value of this character.

The colours are exceedingly variable in one and the same species, and often offer a good guide to determine the genus in the absence of the operculum. The young shells are generally of a brownish colour; the adults vary sometimes from brown or black to pure white.

It sometimes appears that the *Vermeti*, *Balani*, *Ostreæ* and *Anomiæ* not only borrow the sculpture, but even the colours from other shells. It is frequently the case that animals and plants (chiefly sea-weeds) of the most different families and classes living under the same circumstances, are coloured in the same manner. Brewster has shown that the mother-of-pearl colour is received by a cast of melted wax, and consequently is not chemical but purely mechanical, like the different colours of the clouds. A further inquiry will perhaps prove that this fact does not stand quite alone.

The presence or absence of an operculum is of great generic value; but the tube alone does not seem to afford any character by which the operculated species can be distinguished from the non-operculated. The different manner of interception will perhaps prove of use in this question, but further observations must first be made. The shape of the operculum varies in thickness and convexity according to age, but this seems not to be of great specific value, although it is indispensable for the generic determination.

The long bristles of the lid\* of the genus *Stephopoma* afford excellent specific characters. The surface of the lid of *Siphonium* and some other genera shows nothing particular, even under the lens; but if softened in water and scratched with a knife, some small spiny bodies are obtained, which under the microscope look very like some cylindrical nodulous forms of the Cactus family (see Plate XXV. fig. 16). All the *Vermeti* seem to be viviparous. The unborn shells, easily found in the dried animals, have the same fixed form and sculpture as shells in general, and are of more consequence for the establishment of species in this family than in any other.

#### BURTINELLA, Mörch.

*Moerchia*, Mayer, Journ. de Conch. viii. August, 1860, p. 309, non A. Adams, Ann. and Mag. N. H. April 1860.

*Vermicularia*, Mantell.

*Solarium*, Galeotti.

*Vermetus*, Nyst.

*Serpula*, Phil.

This genus, which has no interior septa, is perhaps most allied to *Siliquarius*, which it resembles in the peculiar exterior sculpture, but it differs from it in wanting the branchial slit, like the upper whorls of

\* The only shell before known to have a ciliated operculum is *Turritella unguilina*, first mentioned by Lovèn and Forbes and Hanley; but it has been overlooked that the cilia have five small equidistant spines on one side.

that genus. All the species are fossil, unless the shell figured by Humphrey (Conchology, t. x. f. 8\*) is a living species of the genus.

1. BURTINELLA CONTRARIA (*Trochus*), Schröter.

1777. Kräusel, Martini, Neue Manigfalt. iv. p. 404, t. 1. f. 2.

1783. Schröter, Einleitung. i. p. 784.

1786. Fragmentum *Trochi contrarii* petrificati, Chem. ix. p. 134. f. 977.

1788. *Trochus contrarius*, Schröter, Register, p. 107.

1791. *Trochus ferrugineus*, Gm. Syst. Nat. no. 70.

Fossil from Rhänden or Rhendenberge near Schafhausen.

The last whorl is strongly angulated. The original specimen is still preserved in the Spenglerian Collection.

2. BURTINELLA NYSTII (*Solarium*), Galeotti.

1784. Burtin, Oryctogr. de Bruxelles, pl. 8. f. 9 (Mayer).

1837. *Solarium nystii*, Galeotti, Mem. Geol. de Brab.

1843. *Vermetus nystii*, Nyst, Polyp. Foss. de Belg. ii. p. 373. pl. 36. f. 8.

1860. *Moerchia nystii*, Mayer, Journ. de Conch. viii. p. 310.

Inferior Tertiary formation (Parisienne et Bartonienne).

3. BURTINELLA TURBINATA (*Serpula*), Philippi.

1846. *Serpula turbinata*, Phil. Verz. Magdeburg. Verstein. in Palæontographica, 1846, August 1, p. 80. t. x. f. 14.

Inferior Tertiary sand (lingurian) near Magdeburg (*Phil., Mayer*).

4. BURTINELLA SOWERBII, Mantell (sp.).

1822. *Vermicularia sowerbii*, Mant. Sussex, p. 111. t. 18. f. 14, 15. Hornsey marl pits (grey chalk marl), *Mantell*.

5. BURTINELLA PHILLIPSII, Mörch.

1835. *Vermicularia sowerbii* (Mantell): Phillips's Yorksh. i. p. 95. pl. 2. f. 29.

Speeton Clay (*Phillips*).

This species, according to the author, is also found dextral.

6. BURTINELLA NODUS, Phillips, 1835.

*Vermicularia nodus*, Phill. Yorksh. i. p. 125. pl. 124. f. 34.

Oolite of Cloughton, Bransby (*Phillips*).

STEPHOPOMA, Mörch, Journ. de Conch. 1860, Jan., p. 42.

*Vermetus*, Quoy & Gaim.

*Siliquarius*, part, Gray.

*Tenagoda*, part, Adams.

*T. adulta affixa, contorta, solitaria vel agglomerata; apertura*

\* That the figured shell is in reality *sinistral*, like the species of this genus in general, is proved by the other *dextral* shells being *sinistral* in the accidentally reversed plate.

*superne leviter inflexa, inferne obsoletissime effusa; striæ incrementi bis arcuatim retroflexæ.*

*Operculum arctispirale, inferne convexum, superne concavum, setis longis multifidis munitum.*

*Animal viviparum, descriptum sequente modo in opere dicto 'Voyage de l'Astrolabe,' "En avant du muflé est un appendice median vertical, évasé en entonnoir, susceptible de s'allonger; un peu plus en avant en est un autre qui se recourbe vers l'opercule, et qui n'est peut-être que le pied lui même renflé. Ce sont les analogues de ceux que nous avons vus pairs dans les espèces précédentes, et dont nous ignorons l'usage. Le pied a de plus, sur le côté droit seulement, un petit tubercule pointu, tel qu' Adanson\* l'indique dans son espèce. La cavité respiratrice est ample, et une branchie, à lamelles jaunes, cylindriques et rigides, se rebrousse par-dessus le manteau et fait saillie à l'extérieur."*

*Testa natalis nautiliformis sed asymmetrica, arcuatim regulariter granulosa; operculum nudum membranaceum planum.*

Cuvier, in 1830†, was the first to mention *Vermeti* with a spiny operculum, a fact probably communicated to him by the naturalists of 'L'Astrolabe,' just returned the preceding year from their second circumnavigation.

The form of the aperture varies in the same species from being exactly circular to ovate or reniform. A peculiar obliquity in the aperture of some specimens in each group led me to recognize the species of this genus before the lids were found; this obliquity is very likely occasioned by the long opercular bristles often forcing the animal to withdraw the operculum obliquely, and, by their frequently touching the border of the aperture, stopping the growth of the tube at that side. The bristles, giving the lid quite the appearance of a broom, are much worn, and have the interstices always filled up with fine clay. The use of these bristles in the economy of the animal it is difficult to guess, but it may very likely be the same as that of the spiny horns on the lid of *Cymospira gigantea*, Pall., and the pallets of *Xylotrya* (Leach), which in shape are not very unlike the bristles of *Stephopoma roseum*, Quoy & Gaim. (see Plate XXV. fig. 11). The bristles seem under the microscope longitudinally canaliculated *outside*; but I believe this canal in reality is the hollow interior, as I have distinctly seen under the compressor the air-bubbles move in the interior and even *out* into the lateral spines. The sculpture of the unborn shells has a striking resemblance to that of *Argonauta oryzata*, Meusch., and is continued in a part of the first whorl of the affixed shell. In *Stephopoma tricuspe*, Mörch, the granules look under the microscope like holes with a dark border. The small holes described by Quoy and Gaimard as covering the shell of *Stephopoma roseum*, and supposed to be formed by some parasitical animal, will perhaps prove to be an optical deception occasioned by the sculpture.

\* Adanson has mentioned a little opening in the border of the mantle, but not in the foot.

† Cuvier, Règ. Animal. 1830, iii. p. 109.

1. STEPHOPOMA ROSEUM, Quoy & Gaim. (Pl. XXV. f. 11).

"*T. minima, spirali porrecta, cylindrica, rugosa et rosea.*

"Long. 6-8 lin.

"Opercule rond, brun, multispiré, recouvert d'une grande quantité de soies cornées, divergentes et multifides."

1833. *Vermetus roseus*, L' Astrolabe, ii. p. 300. t. 17. f. 20-24.

*Siliquaria rosea*, Gray, Figures, iv. p. 83. t. 56. f. 3; Guide, p. 128.

*Stephopoma roseum*, Mörch, J. de Conch. viii. p. 42.

"La rivière Tamise (qui est saline) à la Nouvelle Zelande, par d'assez grandes profondeurs."—*Quoy et Gaimard.*

2. STEPHOPOMA TRICUSPE, Mörch (Pl. XXV. f. 1).

*T. agglomerata tenuiuscula, ferruginea hic illic albescens, laxè spirata, longitudinaliter obsoletissime subtiliter-lirulata; striæ et rugæ incrementi irregulares leviter arcuatæ et reflexæ; anfr. primi 2-3 conjuncti helici- vel planorbiformes, sub lente minutissime arcuatim granulosi; apertura circularis vel reniformi-ovalis, faucibus sæpe badiis.*

Diam. aperturæ 4 m. (circ.).

*Operculum arcte spiratum, superne setis tricuspidibus breviusculis confertissimis instructum; inferne planum, badium, concentricè sulcatum et striatum; disculo centrali subimmerso, fossula declivi circumdato; verruca centrali punctiformi; limbus flavescens, latus, nitidus, margine tenui, reflexo.*

*Setæ triramosæ, stipite brevi crassiusculo supra basin contracto, cingulis 5-6 spiniferis; ramus medianus erectus, gracilis, longissimus, nudus, stipite quadruplo longior; ramus sinister dimidium longitudinis vix attingens, extrorsum quadrispinosus, spinæ infimæ geminæ; ramus dexter oppositus brevissimus, vertice trispinoso (fig. 2).*

*Testa natalis nautiliformis (sed asymmetrica) nitida, pallide iridescens, alba vel pallide cyanea, arcuatim punctato-granulosa; granulæ sub microscopio inspectæ, ocellatæ (centro pellucido annulo obscuro circumdato). Spira subulata, obliqua, vix prominens, ferruginea; sutura impressa, canaliculata; umbilico plano, apertura obliqua subhexagonalis; peristoma superne leviter inflexum; anfr. ultimus carina lata convexiuscula. Striæ incrementi profundæ, unde periphèria crenulata. Inveni circiter x. pullos in specimine desiccato.*

Diam. maj. 1 m.

Australia; massa agglomerata (coll. Cuming).

I cannot see any trace of the specimens having been affixed to foreign objects. It is not unlike *Pyxipoma lacteum*; but all the specimens are agglutinated to each other.

3. STEPHOPOMA SENTICOSUM, Mörch (Pl. XXV. fig. 2 & 14).

*T. alba, crassa, aperturam versus tenuis, contorta vel interdum*

*laxe spirata, umbilico angusto; anfr. primi 1-2 modo testæ natalis oblique arcuatim granosi, anfr. sequentes longitudinaliter lirulati, liræ interdum asperæ, sed plerumque omnino evanescentes; interstitia lirula intercalante, anfr. ultimus obsolete biangulatus, teretiusculus; apertura circularis interdum subovalis, superne obsolete inflexa; faucibus interdum pallide castaneis; striæ et rugæ incrementi irregulares, superne et inferne arcuatim retroflexæ.*

Diam. aperturæ circ. 4 mm.

*Operculum superne concavum setigerum, centro nudo, inferne conico-convexum, badium, limbo nitido castaneo; centro liris concentricis 3-4. Setæ longiusculæ, porrectæ utrinque spinis circ. 12 plerumque suboppositis, spinæ majores inferne spinis 1-2 horizontalibus; scapo nudo basi calcarato; lamina expansa subbasalis, margine setoso, setis quatuor longissimis gracilibus approximatis, basi ramulo conjunctis; seta interna recta longior, tertia arcuata.*

*Testa natalis (fig. 14). Argonautæ oryzatæ non absimilis, sed asymmetrica, arcuatim dense regulariter tuberculata; periphæria mammillis validis circiter 25 ornata; spira immersa bullata, umbilico plano; apertura obliqua orbicularis superne inflexa, inferne obsolete effusa. Color castaneus vel albescens.*

Diam. maj.  $1\frac{1}{8}$  m.

*Operculum membranaceum, planum, circulare, inerme, liris duabus concentricis. Mus. reg.*

*Testæ solitariæ vel geminæ in Tridacna scapha (Meusch.) affixæ.*

#### 4. STEPHOPOMA PENNATUM, Mörch (Pl. XXV. fig. 3-8).

*Stephopoma pennatum*, Mörch, Journ. Conch. 1860, p. 42.

*Stephopoma bispinosum*, Mörch, Malacol. Blätter, 1860, p. 78.  
n. 72.

*T. solitaria spiraliter angulatim contorta, umbilico aperto; anfr. primi, modo testæ natalis, oblique confertissime verruculosi, anfr. sequentes longitudinaliter conferte lirulati, quadrangulares vel obsolete pentagoni; striæ incrementi sigmoideæ, antiquatæ, irregulares, squamoideæ; apertura circularis vel subquadrangularis, superne interdum inflexa; anfr. primi crassi, aperturam versus tenues.*

Diam. ap. 4 m.

*Color albus, badius vel mixtus.*

*Operculum inferne plano-convexum, badium, liris duabus concentricis; disculo centrali ruguloso subprominulo, limbo angusto pallido nitido; superne concavum radiatum setosum, centro nudo læviusculo; setæ confertæ erectæ, utrinque spinis inæqualibus alternantibus subinflexis hic illic ternatis; scapus nudus inferne calcaratus, versus basin lamina expansa cornu Cervi elaphi non absimilis, margine aculeato, spinis quatuor longis erectis inæqualibus.*

*Testa natalis (et juvenilis) lateraliter affixa planorbiformis, anfr. primi pulcherrime arcuatim granulosi; granulæ in quadrata dispositæ.*

Var. BISPINOSA (Pl. XXV. figs. 9 & 10.), an sp. distincta?

*Operculum inferne conico-convexum; setæ spinis utrinque circ. 14 sæpe ternatis, calcar basale validissimum erectum (lamina basalis deest?).*

Although this operculum is smaller than that of the preceding, the basal spur of the bristles is much larger; if this is not in consequence of its being unworn, it may be a different species, especially as it is nearly conic below.

*Hab.* Realejo, on *Callopoma saxosum*, Wood, and *Crucibulum scutellatum*, Gray. On the latter shell the specimens affixed to the light-coloured parts are white, and those affixed to the brown parts brown; having, however, seen this on one specimen only, I cannot decide whether it is accidental.

SIPHONIUM, Mrs. Gray, Figures of Moll. Anim. iv. p. 82.

*Siphonium*, "Browne," Mörch, Journ. de Conch. vii. no. 4. p. 353.  
*Stoa*, M. de Serres, Annales des Sciences Nat. iv. 1855, p. 238.

*Operculum magnum, concavum vel infundibuliforme, obsolete spirale, inferne plerumque mammilla centrali.*

Patrick Browne comprehended under the generic name *Siphonium* nearly all those different forms of "worm-tubes," which Linnæus afterwards included in his genus *Serpula*. The first species is thus characterized in the 'Civil and Natural History of Jamaica,' "*Sub-æquale angulatum et flexuosum.*" The second word very likely signifies triangular (*triqueter*), and by "*flexuosus*," is probably meant creeping horizontally in bends, in opposition to "*contorta*," which applies better to the *Vermeti*. It seems to me therefore likely that the first and typical species is a *Serpula*. The fifth species is without doubt *Vermetus Knorrii*, Desh., a form for which Lister previously had instituted the name *Vermiculus*. The only figured species is a *Teredo*. I have adopted the name after Dr. Gray, as it does not appear to have been used before. *Siphonium*, Link., is very badly described in the 'Catalogue of the Rostok Collection,' iii. p. 9, 1807, thus: "Shell straight, with septa forming rings outside. Here belong the straight *Nautili*. *Siph. fasciatum* is exactly like *Nautilus fascia*, Gm., but larger." The species of Gmelin belongs to the Foraminifera.

M. de Serres has established a genus of "Annelides sédentaires tubicolés," under the name *Stoa*, chiefly on account of their habit of burrowing a bed in the surface of other shells, exactly corresponding to the genus *Spiroglyphus* of Daudin. Both authors have mixed together species of two very different genera, the one with a concave, the other with a thick convex operculum; but as Daudin has selected for illustration of his genus a species with an operculum of the latter kind, I regard the represented species as the type, although

it is the second in order. The genus *Stoa* is characterized thus : "Tube testacé contourné en spirale orbiculaire et irrégulière d'un forme discoïde, renflé et convexe ; dernier tour détaché du premier, et se prolongeant parfois en un tube droit, ouverture ovalaire, terminé par un *opercule solide*, calcaire, conique et surchargé, formé par de très petites bandes circulaires presque subspirales." A conical operculum, which is solid and calcareous, seems so unnatural and without analogy among the Mollusca and Annelida that I suppose a covering of *Nullipora* or some other calcareous matter, which I frequently have observed, has given rise to the above statement. In the figure of *M. de Serres* the last whorl of the operculum terminates abruptly at the edge, just like the lid of *Siliquarius*, represented at p. 321 in *Chenu's 'Manuel,'* which I have never seen so strongly expressed, neither have I seen an operculum of the high conical shape figured. The concavity of the operculum is very different, according to the species. In the centre of the under side there is often a conical wart, sometimes very prominent ; but I do not believe it is of generic value, as in a series of species it decreases more and more, and finishes by disappearing entirely. In all the smaller species the operculum is yellow with a red central spot, which, as well as the central wart below, is wanting in the larger species. The whorls are generally few and indistinct ; *S. megamastus*, Mörch, has two or three concentric erect laminae, which give the operculum the appearance of being threefold. The surface is covered with some exceedingly small bodies—scarcely to be seen with the naked eye—of a cylindrical nodulous form, invested with numerous spicula of a glass-like appearance (Pl. XXV. fig. 13). These bodies would be of great importance for the distinction of species if their form were not altered by exsiccation, and if they were not, on account of their minuteness, exceedingly difficult to be shown in the same position for comparison. They are at once to be distinguished from the bristles of *Stephopoma* by their microscopic size and, as it seems, the silicious nature of the spicula, which are always broken abruptly like a steel needle ; whilst the spines of *Stephopoma* are rarely broken. The axis seems to be of the same substance in both genera. The animal is described by Quoy and Gaimard, and Dr. Gray in the 'Spicilegia.' The propodium is semilunar with projecting corners, with two rather small approximating pedal tentacula, which appear to be rudimentary or wanting in *S. tonganum* and *S. reticulatum*, Q. & G., whilst they are rather large in *S. nebulosum*, Dillw., and considerably exceeding the tentacula in size in *S. platypus*, Mörch ; a dried specimen of the latter species showed a flat leaf-like propodium, bringing to mind the under lip of the pupa of the Dragon-fly.

Sect. *a.* DENDROPOMA, Mörch. *Operculum planiusculum, inferne mammilla centrali validissima, superne laminis 2-3 concentricis suberectis ; asperitates vertice trifidæ, spiculis subulatis leviter arcuatis.*

5. SIPHONIUM (DENDROPOMA) MEGAMASTUM, Mörch (Pl. XXV. f. 12 & 13).

*T. teres repens varie torta, lactea in fundo ferruginea, liris longitudinalibus subremotis, lira mediana sæpe valida, striæ et rugæ incrementi arcuatæ, intersectionibus squamiferis; interstitia lirarum obsolete foveolata; apertura circularis obliqua; diam. 4-5 m. T. juventute læviuscula liris obsoletis, nitida, tenuis, castanea, plerumque planorbiformis.*

*Operculum tenuiusculum flavum, superne sat concavum, laminis 2-3 concentricis suberectis, punctis asperis munitum, area centrali aurantia, centro impresso plerumque flavo; inferne planiusculum, limbo nitido pallido convexo; impressio muscularis opaca, cerea, concentricè ruguloso-striata, lirula circulari terminata; mammilla centrali validissima obtuse conica.*

Diam.  $3\frac{1}{2}$  m.

*Asperitates oculo armatissimo inspectæ arborescentes; stirps robustus brevis, ramis tribus porrectis inæqualibus, lateraliter biaculeatis, vertice aculeis 4-6; aculei longi subulati leviter arcuati sed plerumque fracti (fig. 13).*

California?: numerous specimens burrowing, but not very deeply, in the surface of a *Haliotis nodosus*, Reeve. The small vaulted compressed scales of the grooves seem to be caused by numerous small holes of perforating animals, chiefly those of *Cliona*, which have made the surface of the *Haliotis* very rough; but it must be observed that the *Vermeti* themselves are also attacked.

#### Var. CENTIQUADRA.

*Aletes centiquadrus*, var. *imbricatus*, Carp. Cat. p. 302.

*T. brunnea fundo albescens, planorbiformis, semi-immersa, anfr. planati utrinque obtuse angulati, longitudinaliter lirati; liræ subæquales approximatae, striæ et rugæ incrementi arcuatæ, intersectionibus nodulis obsoletis subremotis, vel in locis obtectis, squamulis asperis remotis munitis.*

Diam. testæ 20 m.; diam. aperturæ 3-4 m. Operculum ignotum. California: a single specimen deeply burrowing in an *Haliotis splendens*, Mawe. The sculpture and colour of this shell, which I only regard as a variety, bring to mind the *Aletes centiquadrus*, Val.

#### 6. SIPHONIUM (DENDROPOMA) LITUELLA, Mörch.

*Stoa ammonitiformis*, M. de Serres, Ann. des Sc. l. c. p. 242, note. *Spiroglyphus*, sp., Carpenter, Report, p. 324 (verisimiliter).

*T. varie torta plerumque lituiformis, profundissime immersa; anfr. graciles plani, utrinque obtuse angulati, sæpe fossula longitudinali mediana, unde carina vel lira obtusa lateris externi; striæ et liræ incrementi arcuatæ, approximatae, regulares; apertura circularis interdum obliqua, nonnunquam soluta; color albescens vel cinereus, interdum fascia obsoleta fusca, anfr. primi badii. T. infantilis nitida, apice bullata.*

Diam. ap. 2 m. (circiter).

*Operculum nudum* (?) *membranaceum, pallide flavum, superne leviter concavum, area centrali vivide coccinea, lirula circulari mediana circumdata; inferne convexiusculum; area muscularis flava opaca, mammilla centrali conica prominente, limbus pallide flavus nitidus.*

Diam.  $1\frac{1}{10}$ —2 m.

California: about ten specimens deeply imbedded in the surface of a young *Haliotis splendens* (coll. Cuming).

This species is to be distinguished from the preceding by its narrower whorls, smaller size, prominent and regular striæ of growth, and the absence of longitudinal liræ. It is difficult without the operculum to distinguish this species from *Spiroglyphus spiruliformis*, Serres. The *Stoa ammonitiformis*, stated by M. de Serres to be found on *Haliotis californiensis*, is very likely the young of this species; but the figured typical form from the East Indies differs in the whorls being broader and cylindrical. If the *Spiroglyphus* from Upper California, mentioned by Carpenter (Report, p. 324), is from the Cumingian collection, it must be this species labelled California. The operculum closely resembles that of the young of the preceding, but wants the microscopical tufts, which are perhaps dependent on age.

#### 7. SIPHONIUM (DENDROPOMA) LEUCOZONIAS, Mörch.

*T. planorbiformis, superficialiter corrodens, tenuis, castanea, fascia pallida vel alba laterali; anfr. teretiusculi, utrinque obtuse angulati, superne (nec lateraliter) liris circiter vi. obsoletissime nodulosi; anfr. ultimus aperturam versus antiquatus; striæ et rugæ incrementi arcuatæ, unde irregulariter reticulatæ; apertura circularis, plerumque subsoluta, rarissime immersa; anfr. ultimus interdum rectus.*

Diam. testæ cir. 8 m., aperturæ  $2\frac{1}{4}$  m.

*Operculum rufescens, superne profunde concavum, opacum, concentricè liratum, periphèria margine angusto obscuro; inferne convexum; area muscularis opaca, concentricè bilirata, centro mammilla valida concentricè subtilissime ruguloso-striata; limbus latus nitidus, lineis duabus concentricis saturate rufis, periphèria margine angusto albo.*

Diam. 2 m.

West Africa; on a specimen of *Purpura neritoidea*, L., var. *columella unimaculata*; about thirty-six specimens with a *Vermetus adansonii*, Daudin? The periphery below the angle is white and without liræ. Most of the specimens do not burrow very deep, except where they meet the nodules or ribs of the *Purpura*.

Var. *datur lituiformis*.

#### 8. SIPHONIUM (DENDROPOMA ?) TEREDULA, Mörch.

*T. albescens, in fundo interdum sordide carnea, repens corrodens, varie torta vel glomerata, anfr. teretes antiquati, liris longitudinalibus alternatim minoribus; striæ vel rugæ incrementi acutæ, subremotæ, sigmoideæ; apertura circularis.*

Diam. circ.  $2\frac{1}{4}$  m.

On *Haliotis tuberculata*, probably from Morocco. Operculum unknown.

Deeply burrowing, about half of the shell being concealed.

*Vermetus annulatus*\*, Rousseau, Chenu's Illustr. pl. 2. f. 2 (the smaller figure) looks very like this shell; but it is a gregarious, not burrowing species. *S. teredula* is perhaps most allied to *S. megamastus*, Mörch.

#### 9. SIPHONIUM (DENDROPOMA?) AFRUM, Gm.

*Le Datin*, Adanson, Senegal, p. 165. pl. 11. f. 4.

*Serpula afra*, Gm. S. N. p. 3745, no. 23.

*T. solidissima, albida, corrodens, lituiformis, versus aperturam tenuiuscula, anfr. antiquati, utrinque obtuse angulati, superne planiusculi, liris longitudinalibus alternatim minoribus obsoletis; sulci incrementi profundi irregulares, striæ incrementi confertæ arcuatæ, inferne lateraliter reductæ; apertura circularis vel subquadrangularis.*

Diam. aperturæ circ.  $3\frac{1}{4}$  m. Operculum ignotum.

*Hab.* Gaboon, Western Africa, on *Chama senegalensis*, R.; two specimens. Closely allied to the preceding, but differs in being very thick; the whorls are nearly regularly quadrangular; the striæ of growth are very prominent, except in the last whorl. According to Adanson, the lid is only one-sixth of a line in diameter; it is therefore doubtful if it belongs to this genus.

#### 10. SIPHONIUM (STOA) POLITUM (Daudin).

*Spiroglyphus politus*, Daudin, Recueil, 1801, p. 49.

"*S. irregulariter spiralis, politus, apertura rotunda.*"

"Diam. de 3 lignes au plus. Tube blanc, poli, roulé en deux tours de spirale irrégulière, et plus gros à son ouverture, qui est cylindrique. Il se creuse un lit et s'attache sur diverses coquillages bivalves de l'Inde, du genre des jambonneaux et des peignes." The expression, "plus gros à son ouverture," and the above measurement, lead me to consider this species as identical with *Stoa perforans* of De Serres.

*a. Stoa perforans*, M. de Serres, Ann. d. Sc. N. 1855, v. p. 241. t. 8 c. f. 3-6.

"Cette espèce, à tube court, à spirale raccourcie, dont la dernier tour est sur le même plan que le second, présente dans son ensemble une forme à peu près discoïde. L'ouverture de la bouche ample, arrondie est analogue à celle des Cyclostomes. Les dimensions dépassent peu 0<sup>m</sup>.010 à 0.012."

Represented on a young specimen of *Tridacna gigas*, L.; but, p. 239, it is indicated to be found on *Tridacna*, *Hippopus*, and *Serpula*; p. 238, the species of the latter genus is named *Serpula panamensis*, Chenu, which is *V. eburneus*, Reeve.

\* It is without doubt *Serpula annulata*, Lam., 1818, v. p. 364, no. 11.

## 11. SIPHONIUM (STOA) PLATYPUS, Mörch.

*T. solidissima, corrodens, spira planorbiformis anfractibus angustis, anfr. ultimus ovalis, aperturam versus planus, utrinque obtuse angulatus, striæ et stratæ incrementi arcuatæ remotæ irregulares in latere externo acutæ; apertura circularis obliqua, peritremate superne crasso; color albus, faucibus fuscescentibus.*

Diam. aperturæ 7 m.

*Operculum tenue pellucidum pallide flavum, superne concavum laminis concentricis circiter 4 obsoletis appressis; inferne convexum, limbo nitido latiusculo; impressio muscularis opaca, centro convexo lato aurantiaco, tuberculo minimo elongato subcentrali (an morbo?).*

Diam.  $6\frac{1}{4}$  m.

*Animal rostro brevissimo; capite depressiusculo, utrinque acute carinato, inferne fornicato excavato et transversim pulcherrime lirato; tentacula brevia obtusiuscula oculos ad basin externam gerentia; os minutum infundibuliforme; propodium foliaceum antice bilobatum, utrinque cornu tentacula duplo vel triplo superante. Mesopodium? postice uti bituberculatum. Capite superne et tentaculis utrinque maculis nigris irregularibus ornatis. Ex specimine desiccato.*

*Hab.* Sandwich Islands, on a *Chama*. The specimen has burrowed in its own spire. This shell resembles very much the larger figure of *Stoa perforans*, M. de Serres, but is considerably larger, and has the whorls flattened. The operculum is more flat than conical.

## 12. SIPHONIUM (STOA) DA-COSTÆ, Mörch.

*Serpula*, Humphrey, Conchology, t. 2. f. 15.

*Spirogyphus da-costæ*, Mörch, Journ. de Conch. 1860, p. 46. n. 8.

Since the above name was published I find in my note-book that I have seen this shell, perhaps the very specimen of Humphrey, in the cases of the British Museum, under a more correct name. Although I have not at present any specimen for comparison, I suppose this species is sufficiently distinguished by its crest and want of longitudinal grooves. It appears to be one of the largest burrowing Worm-tubes.

## 13. SIPHONIUM (STOA) SUBCRENATUM (Lam.).

"*T. repente flexuosa, albida; carina dorsali carinisque lateralibus dentato-crenatis, operculo brevissime conico.*

"Ocean indien, sur le *Spondyle mutique*. Elle se creuse un lit sur la coquille" (coll. Lam.).

*Vermilia subcrenata*, Lam. 1818, v. p. 370; ed. Desh. v. p. 634: Blv. Dict. Sc. t. 57. p. 329.

*Stoa? subcrenata*, M. de Serres, Ann. Sc. 1855, v. p. 240.

The shell represented in Chenu's Illustrations, pl. 9. f. 3, et pl. 10.

f. 16, has not a single character in common with the description of Lamarck. A *Spondyle mutique* is not mentioned in Lamarck's later publications; but I suppose it is the *Spondylus microlepos*, Lam. (no. 16), according to the expression "cet *Spondyle semble mutique*," a species not even mentioned in Chenu's Monograph. A query is added to the locality "Ocean indien." I refer to this species the following varieties:—

Var. α. SQUAMULOSA.

*T. albescens, planorbiformis vel repens, sæpe profunde corrodens, longitudinaliter lirata; liræ approximatae, huc illuc alternatim minores, nodulis transversim compressis sat remotis, et in locis occultis squamis parvis acutis ornatis; liræ 1–3 laterales interdum validiores; striæ incrementi obliquæ, obsoletæ, squamiferæ; apertura subcircularis.*

*Operculum membranaceum, diaphanum, pallide flavum, superne sat concavum, vix striatum, inferne convexum, limbo latissimo planulato, flavo, nitido, liris concentricis tribus; mammilla centrali prominente obtusa, obscure purpurea, fascia basali aurantia circumdata.*

Diam.  $1\frac{3}{4}$  m.

On *Tridacna scapha*, Meusch. (Mus. reg.)

Var. β. BIFUNICULARIS.

*T. crassa, profunde erodens, transversim oblique ruguloso-squamosa, longitudinaliter subtilissime lirulata, liris duabus latis subtilissime longitudinaliter liratis.*

Diam. 4 m.; diam. operculi 3 m.; liræ circiter  $\frac{1}{2}$  m. latæ.

On *Turbo margaritaceus*, var.? The two broad longitudinal grooves look like a cast of the furrows of the *Turbo*.

Var. γ. CRISTATA.

*T. triquetra, crassiuscula, carina mediana squamis validis remotis; utrinque angulis acutis, squamis latis angulatis ornatis; liræ incrementi pulcherrimæ, regulares, arcuatæ, leviter flexæ in interstitiis; apertura superne rectangularis.*

Diam.  $2\frac{1}{2}$  m.

On the same shell as the preceding, burrowing in the suture. Not unlike *Vermetus carinatus*, Rouss. (Chenu, Ill. t. 2. f. 4).

Var. δ. SUBDECUSSATA.

*T. repens, profunde immersa, obtuse quadrangularis, antiquata, lirulæ longitudinales subtilissimæ, interruptæ, striæ et lirulæ incrementi subtilissime conferte undulatæ, unde obsolete granulosa.*

Diam. 2 m. Operculum differt a præcedentis macula coccinea centrali latiore.

This variety, as well as the preceding, is very like *S. lituella*, no. 6. On the operculum was found a bristle with minute distant spines; but I am not sure that it is not quite a foreign body.

Var. *ε*. SPINOSA (Pl. XXV. fig. 16).

*T. gracilis, candida, irregulariter spinoso-squamosa, vix lirulata, intus lactea politissima.*

Diam. 3 m.

*Operculum pallide aurantiacum, superne infundibuliforme, centro impresso, spiraliter conferte lirulato, nodulis microscopicis subcylindricis vertice medio inflexo spiculis obsitis; inferne breve conicum, area muscularis parva, margine concentrico elevato terminata, centro acuto submammillato rufo; limbo latissimo nitido, pallide aurantiaco, margine angusto peripherico pallidissimo terminato.*

Diam. 2 m.

*Hab.* Ins. Philippin. (H. Cuming, Mus. Reg.); imbedded in the lower valve of a *Spondylus nicobaricus*. Some parts of the tube are quite free, but near the aperture it is closely imbedded: it seems consequently not to be burrowing except perhaps in the very first whorls. The spines resemble those of the *Spondylus*; it may prove to be a distinct species.

#### 14. SIPHONIUM (STOA ?) TEXTUM, Mörch.

*T. corallicola, albida planorbiformis, omnino immersa; anfr. utrinque rectangulati acuti, aperturam versus ampliati, superficie planissima vel leviter concava; laminæ incrementi arcuatæ, margine conferte undulatæ, regulares erectæ obtusæ, interstitiis profundis angustis; lirulæ longitudinales 5-6 spuria obsoletæ, aperturam versus lirulis obliquis tenuissimis; apertura circularis, obliqua.*

Diam. testæ 15 m., diam. aperturæ  $5\frac{1}{2}$  m.

*Operculum pallide flavum, pellucidum, superne profunde concavum, laminis concentricis confertis appressis obsoletis; inferne convexum, area muscularis spiraliter obsolete lirulata, centro cocineo prominulo obtuso; limbus latus nitidus.*

Diam.  $5\frac{1}{4}$  m.

*Hab.* Ins. Philippin. in *Porite* emortuo, profundissime corrodens. H. Cuming. legit; extat in collectione Dr. Hornbeckii.

#### Var. *a*. SCAPHITOIDES.

*T. scaphitiformis, spira occulta; apertura circularis resupinata æqua, margine postico extus undulato, punctis duabus aurantiis.*

Diam. aperturæ fere 7 m.

*Hab.* Ins. Philippin., in *Porite* emortuo profundissime corrodens (coll. Cuming.).

*Testa juvenilis planorbiformis, umbilico lato planiusculo; anfr. primi fuscii, rugæ incrementi arcuatæ geminæ, antice insculptæ, cinereæ; intus fascia columellari latissima castanea, marginibus pallidis.*

Diam. 4 m.

(Coll. Dr. Hornbeck.)

The sculpture looks very like the knitting of a stocking, and would

be taken for a cast of the coral, if several other specimens of *Vermeti* on the same kind of *Porites* did not show a different sculpture. This species is the deepest burrowing of all the *Vermeti*, the surface being exactly in the same plane as the surface of the dead coral in which it burrows. The young shell closely resembles *Spiroglyphus spiruliformis*, M. de Serres, but the whorls are broader and flatter. The operculum is covered with microscopical bodies similar to those shown in fig. 16 of the plate.

Var.  $\beta$ . UNGUICULATA.

*T. corallicola erodens semi-immersa, spira planorbiformis badia, anfr. utrinque obtuse rectangulati, superne plani, liris obsoletis subremotis, versus aperturam sæpe linea castanea (interdum undulata) marginatis; laminæ incrementi tenuissimæ appressæ margine irregulari, in locis occultis, præsertim in antico latere varicum, crassiores, conferte undulatæ; apertura circularis libera, faucibus albis, columella badia, colore in latere sinistro perspicuo; pone aperturam varicibus duabus erectis, validis, acutis, antice excavatis.*

Diam. apert.  $5\frac{1}{2}$ –6 m.

I have no hesitation in referring this shell to *S. textum*, and the presence of the characteristic undulated laminæ of growth in a few concealed places, and the two small ferruginous spots in var. *a* corresponding to the brown lines in the present variety, seem to be sufficient reasons for this opinion. In the two varices, the form of the whorls, and the manner of burrowing, it approaches *Siphonium maximum*, Sow. The brown lines sometimes bordering the longitudinal *liræ* point to some affinity with *S. pictum*.

15. SIPHONIUM (STOA) SCAPHITELLA, Mörch.

*T. scaphitiformis affixa vix corrodens; spira planorbiformis late umbilicata; anfr. affixi unde planissimi; superne convexi versus aperturam ampliati, longitudinaliter lirulati; liræ plerumque alternatim minores, lira mediana et liræ lateris interni tres validiores squamiferæ; squamæ compressæ, acutæ, remotæ; latus externum oblique varicoso-rugosum; laminæ incrementi brevissimæ, tenuissimæ, regulares, præsertim in regione umbilicali prominentes, aperturam versus obsoletæ; apertura circularis, obliqua, libera. Color albus; stratum internum lateris affixi denudatum, badium.*

Diam.  $5\frac{1}{2}$  m.

*Operculum flavescens pellucidum, superne concavum centro impresso; inferne convexum; impressio muscularis spiraliter conferte tenuissime lirulata; centro aurantio, disculo obtuso cocineo; limbus latus nitidus.*

Diam. 5 m.

The lid is much thinner and somewhat flatter than that of the preceding, the centre is also more blunt and flattish.

*Hab.* Ins. Philippin.; a single detached specimen in Mr. Cuming's collection.

The affixed side wants the thick exterior layer, so that the thin interior brown one is exposed, which seems to indicate that the animal has been slightly burrowing, although it is quite flat, without any trace of convexity. The size and form are those of *S. textum*, M.; but the sculpture and semicylindrical vaulted shape of the whorls are quite different.

16. SIPHONIUM PICTUM, Mörch.

*T. tenuiuscula, repens, superficialiter corrodens; anfr. subcylindrici, superne planiusculi, liris noduliferis compressis 4-5, utrinque linea ferruginea terminatis, lira externa interrupta; noduli obsoleti, elongati, remoti (subsquamosi), antice interdum fissi; interstitia lirulis duabus inæqualibus; laminæ incrementi tenuissimæ, appressæ, margine leviter rimosæ, in interstitiis arcuatis; apertura ampla, circularis; intus ubique badia vel castanea.*

Diam. aperturæ 10 m.

*T. juvenilis planorbiformis. Operculum ignotum.*

*Hab.* India orientalis; in specimen pedale *Tridacnæ gigantis* leviter corrodens (Mus. Regium).

Humphrey, Conchology, pl. 10. f. 12, 12 (verisimiliter).

This shell is rather thin in proportion to its size. The *laminæ* of growth are arcuate between the grooves, and are not unlike those of *S. textum*, var.  $\beta$ , which it also resembles in the *liræ* being most strongly coloured at the sides.

Var.  $\alpha$ . TURBOIDES.

*T. crassa, candida, turbinata; anfr. ultimus superne planiusculus, antiquatus, fulvus, liris 4-6 ferrugineis, nodulis elongatis, subsquamosis, compressis, badiis; interstitia lirulis 1-2 parvis; latus externum inæquale, noduloso-rugosum, internum planum; laminæ et striæ incrementi arcuatæ, unde interstitia leviter imbricata; apertura subovalis, intus candida, inferne fuscia tosta intrante pellucente.*

Apert. 8 m. lata, 10 alta; diam. anfr. ult. 12-13 m. (coll. Cuming. sine loco).

*Hab.* India orientalis.

A detached specimen with the impression of the ribs of a *Pecten*, small remains of a yellow coral, and an agglutinated dark-green spine of *Stella spengleriana*, Chemnitz, to which it was very likely attached.

This variety differs chiefly from the type in its great thickness and in having only a dark basal band inside, while the whole interior of the type is brown. The sides are pure white without longitudinal grooves. The under side shows, close to the mouth, a part of the interior dark band. On the upper side are four or five not very prominent arched varices, gaping a little in the front. From the var.  $\gamma$  of *S. nebulosum* it differs in its proportionately larger calibre, but chiefly in its yellow band and brown-coloured grooves, of which I have never seen any trace in the numerous specimens of its West Indian analogue.

## 17. SIPHONIUM NEBULOSUM, Dillwyn, 1817.

*Tuyaux de mer*, Davila, Cat. 1767, i. p. 100. t. 4. f. H (typus); Favanne, i. p. 652. t. 6. f. 3 (copy).

*Serpula nebulosa*, Dillw. ii. p. 1076. no. 19; Wood, Index, *Serpula*, fig. 18 (copy).

*T. juvenilis planorbiformis, corrodens, castanea, aurantiaca vel alba, leviter spiraliter lirulata.*

*T. ætate media affixa, spiraliter varie contorta, alba pallide aurantiaca variegata, longitudinaliter lirata, superne carinis tribus squamiferis; stricæ et rugæ incrementi sigmoideæ, inæquales; apertura circularis, libera, interne fascia basali intrante tosta vel anthracina, ferrugineo terminata.*

*T. grandæva libera, tubulata, leviter torta, teres, æqualis, antiquata, liris longitudinalibus obsoletis et subobliquis, annulatim rugosa et sulcata, inferne septo convexo obliquo terminata. Color candidus, intus juxta aperturam macula interrupta castanea.*

Long. 80 m., diam. 10 m., diam. apert. 9 m.

*Operculum pellucidum, flavescens, superne concavum, laminis approximatæ concentricis, inferne convexum; impressio muscularis magna, rufa, concentricè ruguloso-striata, linea coccinea peripherica terminata, vertice obtuso lato prominulo; limbus elevatus, nitidus.*

Diam. 7 m.

The concentric *laminæ* seem to form a distinct upper layer, which can be separated with a knife. The spiniferous bodies are clavate, and of the same kind as shown in fig. 16, but more elongate, and dilated at the base. The surface is sometimes entirely occupied by a young specimen or a *Serpula*.

## Var. α. SERRATA.

*T. liris destituta, carina laterali squamis 6-7 subremotis, compressis, acutis, inæquilaterali-triangularibus; latere externo plano; fascia interna nigra ferrugineo terminata.*

Diam. 6-7 m.

*Hab.* Honduras; on a branch of dead coral (coll. Cuming.).

## Var. β. ACULEATA.

*T. carina submediana, squamis 7-8 compressis, angustis, longis, liris duabus aculeato-squamosis in regione umbilicali, unde apertura superne trispinosa, latere externo liris obsoletis nodulosis, inferne transversim rugosa, latere affixo glauco et castaneo variegato; intus fascia nigra tosta.*

Diam. ap. 5 m.

*Hab.* Honduras (coll. Cuming.).

## Var. γ. TURBOIDES.

*T. liris 6 subæqualibus, leviter nodulosis.*

*Serpula bicarinata*, Sow. Man. f. 4; Humphrey, *Conchology*, pl. 10. f. 9 & 10.

*Vermicularia arenaria*, var. *a*, *b*, *c*, Gravenh. Tergestina, p. 51 (ex specim. orig.?).

Var.  $\delta$ . IMBRICATA.

*Serpula? dentifera*, Sow. Gen. f. 6.

*Vermetus dentiferus*, Gray, Philos. Trans. 1833, p. 816.

Var.  $\epsilon$ . PLANORBOIDES.

*T. affixa*, carina submediana acuta, squamis remotis munita; regione umbilicali bilirata, latere externo lirulis 6-7, interstitiis lirula intercalante.

Diam. 20 m., diam. ap.  $5\frac{1}{2}$  m.

Hab. St. Thomas, on *Avicula columbus*, Bolt.

Var.  $\zeta$ . RUGOSA.

*T. antiquata et annulatim rugoso-striata*; anfr. primi liris granulosis, aperturam versus evanescentibus.

Diam. 7 m.

Humphrey, Conchology, t. 10. f. 8.

Var.  $\eta$ . ANAULAX.

*T. liris carens*, lamina variciformi pone aperturam ampliatam, intus fascia basali castanea.

Diam. apert. 9 m.

Hab. Honduras (coll. Cuming.).

Var.  $\theta$ . FISSURATA.

*Anfr. ultimus conferte et regulariter annulatim rugosus.*

This variety looks very like a *Siliquarius*.

*Serpula dentifera*, Lam., no. 24, var. *b*, testis majoribus subsolitariis (Mus.), and var. *d*, testis subrugulatis, glomeratis, belong very likely to this species; it would at least be very remarkable if this exceedingly common shell were not known to Lamarek.

## 18. SIPHONIUM GÆDEROPI, Mörch.

*Serpula* (an *Vermetus*?) *turboides*, Chiereghini, Venez. 1847?; Chenu, Monogr. du Spondylus, pl. 12. f. 3?.

*T. solitaria*, contorta, spira affixa; anfr. ultimus solutus, costulis spiralibus 1-3 squamis compressis remotis munitis, interstitio dorsali bilirato; striæ incrementi subtilissimæ, arcuatim flexæ, huc illuc antiquatæ vel rufæ. Color albus vel sordide carneus.

Operculum superne profunde concavum, rufum, laminis spiralibus confertis brevissimis appressis flavis, unde annulis angustis alternantibus flavis et rufis, centro profunde immerso fundo lato; inferne convexum; impressio muscularis obscura, concentricè rugoso-striata, sulco lato plano pallido terminata, centro obtuso lato prominente pallido, limbo latissimo nitido, lineis 4 flavis concentricis.

Diam.  $2\frac{3}{4}$  m.

Var.  $\alpha$ , *costulis æqualibus, circiter 12-14, approximatis, asperis, oblique tortis, præsertim in regione umbilicali, ubi squamiferæ; apertura circularis leviter constricta.*

Var.  $\beta$ , *carina mediana prominente.*

Diam. apert. 5 m.

*T. juvenilis candida crystallina, pallide fusco tincta, verrucis cylindricis munita* (Algir. Guyon, Mus. Reg.).

On *Spondylus gæderopus*: probably from Spain.

The young shell is of a white, chalcedony-like appearance.

#### 19. SIPHONIUM LURIDUM, Mörch.

*T. contorta, tenuiuscula, subdiaphana, pallide lurida; anfr. teretes, rapide crescentes, soluti, angulatim contorti, longitudinaliter striati et lirati; liræ prominulæ, circiter 20, squamis fornicatis compressiusculis, præsertim aperturam versus, validis, interdum transversim confluentibus; striæ incrementi in interstitiis costarum leviter arcuatæ; anfr. primi graciles, laqueati, albi, sculptura evanescente; apertura circularis, soluta, faucibus strato tenuissimo sericeo obtectis.*

Diam. apert. 18 m.

*Hab.* Society Islands (coll. Cuming.).

The colour and sculpture remind one of certain varieties of *Pinna pernula*, Ch. The longitudinal flat and feeble *liræ* are almost obsolete on the scales; there are about three to six between the keels. The inner thin layer scarcely conceals the outer brown colour. Some of the keels show small indistinct white spots. The sculpture on the infero-marginal side is entirely rubbed out, and shows the cast of some foreign body: on one of the first whorls are distinctly to be seen the cast and rests of the cells of a *Bryozoon*. The lid is unknown, and the genus of course a little doubtful.

#### 20. SIPHONIUM MARGARITARUM, Val.

*Vermetus margaritarum*, Val. Voy. Venus, pl. 11. f. 2 (the larger).

*Vermetus margaritaceus*, Rouss., Chenu, Ill. t. 4. f. 2 (the same).

*Aletes margaritarum*, Carp. Cat. Reigen, p. 303.

*Siphonium margaritarum*, Mörch, Journ. Conch. 1859, p. 359.

*Hab.* Panama (*Val.*); Mazatlan (*Reigen*).

I refer this species to the genus *Siphonium*, on account of the circular mouth, and some likeness to the much smaller *S. nebulosum*, Dw. The lid is unknown. In Mr. Cuming's collection there is a shell, without locality, very like the quoted figure; but the aperture is much higher than broad, of an oblong trapezoid shape, and the outer basal angle of the aperture is very sharp, while the upper is obtusely rectangular (alt. max. obliq. 22 m., lat. 14 m.). In the interior is a broad blackish basal band spreading on the sides like that of *S. nebulosum*, but broader. This shell will very likely prove to be generically distinct, as all the specimens of *Siphonium* I have seen have a circular mouth, depending on the large operculum.

## 21. SIPHONIUM SUBGRANOSUM, Mörch.

*Siphonium costale*, "Lam.," Mörch, Journ. Conch. 1859, p. 358.

*T. crassiuscula*, spiraliter contorta, spira affixa, alba vel flavescens; anfr. teretes vel latere inferno dilatati, longitudinaliter conferte lirulati; liræ subæquales, sæpe 5-6, prominentiores, lira mediana plerumque valida prominens; interstitia lirula intercalante; stricæ et lamellæ brevissimæ, incrementi sigmoideæ, regulares, unde liræ subtiliter granulosæ et in locis occultis minutissime undulato-squamosæ; apertura circularis, libera nec soluta, intus candida.

Diam. circ. 5 m.

Operculum superne concavum, laminis confertis concentricis lateris, rufum, zona submediana flava, centro nudo excavato; inferne convexum, impressione musculari parva, cruentata, concentricè ruguloso-striata, linea coccinea terminata, centro conico valido prominente, apice obtuso læviusculo pallide flavescente; limbus convexiusculus, nitidus, bicolor, dimidio interno flavo, externo coccineo.

Diam. fere 7 m.

Hab. India orientalis (Tranquebar?), on *Malleus vulgaris* (L.), *Delphinula distorta* (L.), *Voluta lapponica* (L.), and *Margaritifera inflata* (Schum.).

Var. α. CARINATA.

*T. affixa*, spiraliter torta, umbilico lato, subtilissime conferte lirulata; liræ æquales, subtilissime granulosæ, carina valida compressa mediana, squamis remotis obsoletis, lira prominula in regione umbilicali. Color flavescens.

Diam. ap. 8-9 m. (Mus. Reg.).

Var. β, varice erecta intus incrassata.

Var. γ, triquetra.

*T. tenuiuscula*, decliviter contorta, umbilico clauso lira prominula circumdato, unde anfr. subtriquetris, longitudinaliter pulcherrime lirulatis et granulosis, interstitias lirula intercurrente; anfr. primi teretes, planorbiformes; apertura circularis, contracta.

Diam. ap. 3½, diam. anfr. ult. 5-6 m.

Operculum pallidum unicolor (desiccatione verisimiliter), superne laminis solutis concentricis, unde uti duplicatum, limbo obscuro, centro infundibuliformi fundo excavato; inferne mammilla valida, conica, prominente acutiuscula.

Diam. 3½ m.

Several specimens on an *Avicula* resembling *A. ægyptiaca*, Chemn. xi. f. 2019, but posteriorly deeply inflected.

This species is not very unlike *V. costalis*, Chenu, t. 10. f. 6; but I have never seen any specimen of that size with such broad grooves, nor with a protracted last whorl.

## 22. SIPHONIUM CARINIFERUM, Gray, 1843.

*Vermetus cariniferus*, Gray, Dieffenbach, New Zealand, p. 242.

"Shell thick, irregularly twisted, opaque white, with a high compressed wavy keel along the upper edge; mouth orbicular, with a tooth above it, formed by the keel. Operculum orbicular, horny."

New Zealand, Parengarenga, North Cape, North Island (*Dr. Dieffenbach*).

According to the description of the operculum, Dr. Gray is no doubt correct in referring this shell to the *Vermetidæ*. From the dorsal keel I suppose it must be a *Siphonium*, which is the only genus among the *Vermetidæ* which has this character, most common among the *Serpulidæ*.

23. *SIPHONIUM MAXIMUM*, Sow., 1825.

*Serpula maxima*, Sow. Tank. Cat. App. p. 93. n. 23.

"*T. irregulariter contorta, læviuscula, carina dorsali antice in spinam nonnunquam desinente; apertura expansa, testarum juniorum subtrigona, operculo corneo.*"

Several specimens exist in collections; they are attached to, and some of them deeply imbedded in coral. It is a very large species, the tubes being almost an inch wide. The aperture in the older shell is round (*Sow.*).

*Vermetus maximus*, Gray, Spicileg. 1829, 1. p. 3, cum fig. anim.

"*T. junior adhærens, irregulariter contorta, subtriangularis, dorso carinato, superius erecto, rotundato; apertura orbicularis; peristomate tenui*" (*Gray*).

Pacific Ocean, with coral, Stutchbury (*Mus. Brit.*).

*Vermetus gigas*, Gray, Fig. of Moll. iv. p. 28. t. 128. f. 1.

*Siphonium maximum*, *ib.* p. 82.

*Serpula maxima*, *Brit. Mus. Wood*, Index Supp. t. 8. f. 2 (8 inches).

I have never seen a triangular young shell with a prominent keel running out into a spine; such a shell is, however, represented by Wood, creeping on the old individual; perhaps it is a *Serpula*. The figure of Wood, from a specimen in the British Museum, is probably not only the very specimen of Gray's, but also of Sowerby's description.

Var.  $\alpha$ . *T. grandæva, repens, aperturam versus ampliata, superne undulato-varicosa, varice præcipitante juxta aperturam; striæ incrementi membranaceæ, confertissimæ.*

Diam. aperturæ 33 m.; diam. cavitatis postice 14 m., long. cavitatis circiter 230 m.; diam. max. tubæ antice 40 m., postice 20 m. (*coll. Chr. viii.*).

*Vermetus gigas*, A. & G., Chenu, Ill. t. 5. f. 6 a (but smaller).

Var.  $\beta$ , *teres; læviuscula.*

*Karang surumbung\**, Javanorum, Junghuhn, Java, 1854, iii. p. 68. (*tabula ultima*).

\* *Karang* signifies a tube or quiver, and *surumbung* a coral reef or rock; the former is probably the same as the Malayan *cappang*, according to Rumphius, used for *Cuphus* and *Tenagodus*.

*T. adulta elongata, tubulosa, recta aut subflexuosa, e partibus lateralibus septorum concreta, inde concentricè lamellosa et stratificata, crassa, extus transversim striata et subannulatim rugosa et aspera, sæpius subtuberculosa et inæqualis, intus lævissima, nitida (testa junior ad basin infimam attenuata et spiraliter torta); septa transversa, remota, imperforata, tenuissima, tubuloso-hemisphærica (cupuliformia) se invicem amplectentia (superiora inferioribus incumbentia); partes laterales in testam concretæ; basis septorum libere prominula, clausa, hemisphærica, papyraceo-tenuissima, fragilis, rarius hemisphærico-conica et subobliqua; habitus orthoceratitoides, sed siphon nullus (Junghuhn).*

Diam. testæ 8-14 lin., cras. testæ  $\frac{3}{4}$ -2 lin.; septæ internæ diam. 6-7 lin.

According to the inhabitants this shell is only found in Java, at Karangitam, which forms a part of the broad reefs at the mouth of the small river Kalapatjondong, in the district Djampang, on the south coast of Java. The tubes, which at flood-tide are covered with 8 feet of water, stand upright in slightly bent positions, like organ-pipes, so closely together on the rock which they form, that it is only by touching the many small holes of the apertures that their presence is recognized. To this variety belongs very likely the shell brought from Sumatra by Capt. Griffiths, and described by Home, Phil. Transact. 1806, pp. 276 & 287 (Woodward, in Proceed. 1857, p. 245).

*Vermetus gigas*, Owen, Mag. of Nat. Hist. 1838, Aug., p. 408, f. 20.

*Vermetus gigas*, A. & G., Chenu, Ill. pl. 5. f. 6.

*Siphonium gigas*, Chenu, Man. p. 320. f. 2304 (copy).

*Serpula gigantea*\*, or great Oriental Worm-shell with its operculum: a young specimen (Seba, t. 94), Port. Cat. 1786, p. 6, no. 97.

The figures of Owen and Chenu seem to unite Junghuhn's shell with the following form, which is the typical:—

Var.  $\gamma$ . SCANDENS.

*T. contorta, inter ramos Heteroporæ scandens; anfr. teretiusculi superne et inferne subplanati, rugis transversis latis obsolete arcuatis, varicibus crassis præcipitibus 1-2; striæ incrementi membranaceæ, confertæ, sæpe ferrugineæ; apertura circularis, intus candida, peritrema intus carneum.*

Diam. 21 m.

*Operculum pellucidum castaneum; superne profunde concavum, area centrali opaca, periphæria elevata; limbo lævissimo, margine angusto flavo, uti cote attenuato; inferne elevato-convexum; impressio muscularis rotundata, prominula, concentricè interrupte rugulosa; limbus planissimus, latus, nitidus, margine interno canali plano angusto terminato.*

Diam.  $18\frac{1}{3}$  m., lat. limbi 5 m., alt. operc. circiter 7 m.

\* The middle figure on pl. 97 of Seba is very likely meant, which perhaps is a *Cuphus*. The specimen was obtained by Sykes for 9s. at the auction.

*Hab.* Lord Hood's Island (coll. Cuming.); a specimen twisted among the branches of a dead *Heteropora*, agreeing very well with Wood's figure, which distinctly shows close to the mouth one of the characteristic abrupt feebly excavated varices. The operculum of *Vermetus giganteus* from Guam, represented by Quoy and Gaimard, pl. 67. f. 14, differs in having an impressed line close to the periphery, and in having the muscular impression concentrically furrowed with lines of alternately different sizes. The operculum in Chenu's 'Illustrations' has a central red spot, which I have not observed in any of the present specimens. This shell shows a tendency to grow vertically, and unites thus the form described by Junghuhn with the other varieties, which are all creeping.

Var. δ. OPERCULO MEGACENTRO.

*Operculum inferne convexum (nec elevato-convexum), limbo convexiusculo prominulo angusto; impressio muscularis magna, subtiliter concentrice striata.*

Diam.  $17\frac{1}{3}$  m., lat. limbi 4 m., alt. operc. 5 m.

*Hab.* Lord Hood's Island (without shell).

This lid is flatter than that of the preceding, and, although the diameter is only a little smaller, the central area is notably larger, and the brim consequently narrower; the exterior yellow peripheral band is marked by an elevated margin as if scratched thin. The concentric lines of the muscular impression are more feeble, sharper, and more regular towards the periphery; they are more distinct, and form small elongate areas.

Var. ε. BIANGULARIS.

*Karang surumbung*, var., Junghuhn, Java, f. 3 (optime).

*T. repens, corrodens, semiimmersa, aperturam versus lente crescens, utrinque obtuse angulata, lateribus planatis, superne planiuscula vel leviter concava varicibus arcuatis præcipitibus; striæ incrementi membranaceæ, plerumque ferrugineæ; apertura circularis (vel in specimine incompleto utrinque dilatata ex angulis).*

*Color anfr. primi ferrugineus.*

Spec. majoris long. cavitatis int. 120 m.; diam. ap. 15 m., alt. 14 m.

Spec. minoris long. cavitatis int. 90 m.; diam. ap. 15-16 m., alt. 13 m.

*Operculum tenue, convexum, pallide castaneum, superne plano-concavum, laminis appressis concentricis obsoletissimis, uti farinosum; area centrali magna, obscura periphæria elevata; limbo obsoletissime radiato, periphæria pallide flava; inferne plano-convexum; impressio muscularis opaca, concentrice ruguloso-striata, læviuscula; limbus nitidus, castaneus, linea obscura interna terminatus, periphæriæ margine angustissimo pallido.*

Diam. 15 m., limbi lat.  $3-3\frac{1}{4}$  m., alt. circ.  $2\frac{1}{2}$  m.

The upper side is covered with a farinaceous layer, which, seen under the microscope, seems to show some bodies of the same

character as those seen in fig. 16. In the brim of the under side are here and there some of the kind, shown by small sharp points, which look like imbedded sand-corns.

*Hab.* Lord Hood's Island; two associated specimens half sunk in the surface of a dead coral (coll. Cuming.).

The smaller specimen has the aperture incomplete, and shows on both sides an auriculated production formed by the lateral angles; the upper side of the aperture is inflected like the striæ of growth, whilst that of the adult specimen is straight. The first part of the whorls is entirely concealed by the coral which, perhaps, has overgrown it. This, however, is not clear, because a saw has been used to diminish the size of the coral.

Var. ζ. PRÆLONGA.

*T. repens, corrodens, gracilis, fere per totam longitudinem æqualis, utrinque obtuse rectangulata, inferne elevato-convexa, tenuis, superne crassa, plana, lævis, sebacea, sordide alba, varicibus huc illuc parvis acutis oblique arcuatis; striæ et rugæ incrementi obsoletæ, arcuatæ, granulis oblongis obsoletissimis; anfr. primi laqueati conjuncti, lateribus inferne dilatatis; septa frequentissima, cylindræco-convexa, tenuia; apertura parva, superne arcuata reducta, lateribus rectis.*

Long. 64–82 dm., long. cavitatis 12 dm., diam. transv. aperturæ 10–11 m., crassitie superne 6 m.

*Hab.* Lord Hood's Island, a detached specimen; the exterior layer of the shell is wanting on the under side, which proves it has been burrowing. This enormously long and very narrow shell differs chiefly from the preceding by its smooth tallow-like, slightly shining surface; the striæ of growth are only a little foliaceous in unexposed places; it has nearly the same diameter throughout its length from the mouth, whilst var. ε increases somewhat more rapidly. The transition between the above-described varieties seems so evident to me, that I do not dare to distinguish any of them specifically, not even the last. An allied species from the island of Tubal, in the Red Sea, collected by Rüppell, is indicated by Leuckart, 'Neue Wirbellose Thiere,' 1827, p. 39.

VERMICULUS, Lister, Hist. Conch. 1688, t. 548.

*Tubulus*, Schwammerdam, Bibl. 1738, p. 50. t. 7. f. 5, 6.

*Siphonium*, no. 3, Browne, Jamaica.

*Vermicularia*, Lam. Prod. 1799; System, 1801; Bowd. Elem. 1827.

*Vermetus*, Gray, Gould, Adams, Stimpson, Carp., non Adanson.

*Testa varie torta, juventute turritelloidea.*

*Operculum magnum, superne concaviusculum, laminis concentricis suprapositis margine laciniato, limbo reflexili; inferne convexiusculum, impressione musculari confertissime concentricè lirulata.*

Stimpson has described the animal thus:—"Mantle fringed at its

margin with short filaments. The foot is very short and broad, dilated into rounded auricles anteriorly. The muzzle is broad, not cleft; the tentacula are short, conical, having their eyes at their exterior base. An elevated ridge runs along the back, becomes flattened into a membrane at the head, and passes round under the right tentacle, forming a kind of canal, near which is the anus. Its colour is a light brown, with spots and patches of black; viviparous. The young shell is helicoid and reversed. The operculum is corneous, black and hard on the inner, and lamellated on the outer surface. It is surrounded by a thin, membranous, flexible portion, about one-fourth its diameter; thus it is enabled to close its shell perfectly at the aperture, and yet to retreat far into the narrower whorls." This latter assertion is not quite correct; an operculum of *V. lumbricalis*  $\beta$ , has a diameter of  $6\frac{1}{2}$  m., whilst the aperture of the shell has a diameter of 7 m.

Sowerby, in his 'Genera,' was the first to give a representation of the lid, but this is not very satisfactory. A drawing of *V. eburneus* from life by Prof. Oersted shows considerable differences, as will be described below.

#### 24. VERMICULUS TORTUOSUS, Soldr. 1784.

*T. laxa contorta*; anfr. latere externo plano vel etiam concaviusculo, lævissimo, superne et inferne rectangulato, costa marginato, spira conica abbreviata (ex icone).

1784. *Le Quadrilatère*, Fav. Cat. de Latour d'Auvergne, no. & f. 1412; Humphrey, Conchology, t. 11. f. 4 (typus).

*Serpula tortuosa*, Sol., Port. Cat. p. 184. no. 3939.

*Vermetus costalis*, Rouss., Chenu, Ill. t. 3. f. 1 & 1 b; Man. f. 2295.

*Vermiculus tortuosus*, Mörch. Journ. Conch. vii. p. 30.

#### Var. $\alpha$ . UNICOSTALIS (ex icone).

*Vermetus costalis*, Rouss., Chenu, Ill. t. 3. f. 1 a & c.

*T. latere externo convexiusculo, liris duabus æqualibus, inferne costa prominula marginato, superne nudo convexo; aperturam versus strigis aurantiis transversis.*

#### Var. $\beta$ . NIDIFICANS.

*T. tenuiuscula, fusco-lurida, strigis ferrugineis obsoletis transversis, spiraliter torta; anfr. uno latere contigui, obtuse quadrangulares, longitudinaliter lirati et confertissime striati; latere externo declivi, inferne acutangulo, carina pallida albescente maculis ferrugineis notata; superne liris tribus, lirula intercalante, angulo obtuso mutico; latere interno angulo juxta umbilicum lira gemina munito, liris duabus tribusve, lirula intercalante; regio umbilicalis conferte plano-lirata; apertura ampla, orbicularis, obtuse quadrangularis; spira gracilis, ferruginea; anfr. ultimus carinis obtusis tribus interstitiis striatis, anfr. cæteri lævigati, nitidi, medio carinis duabus subæqualibus, interne lirula suturali obsoleta.*

Diam. ap. 11, alt. 12 m.; long. spiræ circ. 9 m.

*V. costalis*, Chenu, pl. 3. f. 1 *a*, quoad sculpturam; Humph. t. 10. f. 5, quoad formam.

*Hab.* Ins. Philippin. (*Cuming*).

Three specimens affixed to the branches of a furcate coral, not unlike *Trymohelia eburnea* in shape, but very likely allied to *Leptastræa*.

This species is not quite without doubt distinct from *V. lumbricalis*. The *V. indicus* (Rous. t. 3. f. 2 *b*) seems to be a transition. The spire of var.  $\beta$  is entirely different from that of fig. 1 in Chenu, but agrees with that of *V. lumbricalis*, var.

## 25. VERMICULUS SOLARINUS, Mörch.

*T. solidissima, alba, strigis transversis pallide aurantiis in intersectionibus costarum saturatoribus; anfr. laxi, subquadrangulares, latere externo rectangulato, carinis tribus æquidistantibus crenulatis; interstitia fundo lævi nitido, longitudinaliter lirulata, liris duabus validis obsolete nodulosis; latere interno semitereti, conferte grosse-lirato, interstitiis profundis hic illic lirula intercalante; liræ incrementi regulariter subremotæ, in intersectionibus lirarum incrassatæ, unde superficie rudi; apertura latere externo rectangulato, interno arcuato.*

Long. fere 27 dm. ; diam. ap. 9–10 m.

*Spira turritelloidea, nitida, alba, basi plana, concaviuscula, carina prominente marginata, superne carina acuta approximata; anfr. angulo inframediano carina acuta munito, inferne lirula suturali subocculata.*

Long. fere 6 m.

*Hab.* Ins. Philippin. (*Cuming*). One specimen.

The first whorls are planorbiform. The spire is very like that of *Turritella carinifera*, Lam., and agrees in this respect with the vars.  $\delta$  and  $\delta\delta$ , of the following species.

## 26. VERMICULUS LUMBRICALIS, L.

“*T. quasi cornea, teres seu versus apicem obsolete angulata, sensim angustior.*” L. Mus. L. Ulr. 689. no. 431.

*Serpula lumbricalis*, Linn. S. N. x. p. 787, no. 698; xii. p. 1206, no. 801.

Professor Liljeborg of Upsal has favoured me with a drawing of the original specimen in the Museum of the Queen. I do not know any figure corresponding exactly with it, except perhaps *V. indicus*, Chenu, Ill. t. 3. f. 2 *a*. It agrees very well with the var. *a* in size and form; but the keels are not continued to the mouth, and the longitudinal grooves, rather strong between the keels, are not represented in the drawing.

### Var. *a*. DIAPHANA.

*T. tenuis, diaphana, dilute castanea; anfr. laxè contorti, inferne carinis duabus leviter crenatis, maculis vel punctis obsolete albis et castaneis, interstitio plano vel leviter excavato, liris*

3-4 *approximatis*; *latere externo plano, læviusculo, obsoletissime lirulato, superne obtuse angulato, liris tribus approximatis, latere interno convexo subtilissime lirulato: spira elongato-conica, turritelloidea (figura in Gen. Sowerbyi non absimili sed minore), ferruginea, basi lata plana vel concaviuscula, carina prominente marginata, superne carina compressa approximata, versus suturam lira sursum evanescente; anfr. primi inferne carinis duabus subæqualibus.*

Diam. ap. fere 7 m.

Buonanni, f. 20? (aggregata?).

*Operculum superne concaviusculum, flavescens, laminis concentricis suprapositis margine laciniatis; inferne convexiusculum, badius; impressio muscularis conferte concentrice sulcata, centro prominulo convexo; limbus bipartitus, parte externa flava flexili, interna nitida badia, juxta aream canali circulari plana.*

Diam. circ.  $6\frac{1}{2}$  m.

Coll. Cumingii, sine loco.

Var.  $\beta$ . CORNEA, KNORR, Vergn. t. 2. t. 13. f. 1 quoad colorem.

*T. solidissima, badio et castaneo variegata, laxè contorta, longitudinaliter subtilissime lirulata; anfr. graciles (præsertim superne) latere inferno plano, utrinque carina irregulariter subnodulosa, interstitio lira gemina mediana; latere externo inferne lira acutiuscula carinam approximante, superne angulo obtuso, liris 3-4 approximatis subæqualibus; latere interno pallido convexo, lirulis inæqualibus; striis et rugis incrementi sigmoideis, aperturam versus antiquatis; spira deficiente sed verisimiliter ultra solitum parva; apertura circularis inferne incrassata.*

Diam. 7 m.; diam. septi (fracturæ) circ.  $\frac{3}{4}$  m.; long. testæ  $22\frac{1}{2}$  m.

Coll. Cumingii, sine loco.

Differs from the preceding by its great solidity, and chiefly in the outer side being of a very dark, nearly black-brown colour.

Var.  $\gamma$ .

"*Apertura biangulata.*"

*Vermetus bicarinatus*, Desh. Anim. s. Vert. 1843, ix. p. 67.

Var.  $\delta$ . AMPLIATA.

*Vermetus bicarinatus*, Desh., Chenu, Leçons Elém. p. 182. f. 602.

*V. indicus*, Rouss., Chenu, Ill. t. 3. f. 2 *b* (idem).

*T. tenuiuscula, dilute castanea, laxè contorta; anfr. approximati, subtilissime lirulati, superne graciles versus aperturam ampliati, oblique quadrangulares subgibbosi, latere interno declivi planiusculo, liris geminis in medio, superne carina acuta pallida, inferne carina obtusa subnodulosa terminato; latere externo superne obtusissime angulato; apertura transversa, ovata, latere interno angustato; spira turritelloidea et ei *V. solarini* simil-*

*lima; anfr. infimus inferne bicarinatus, anfr. 6 primi angulati, carina acuta, lira suturali suboculta.*

Diam. ap. circ.  $9\frac{1}{2}$  m.; alt 9 m.

A specimen very like the quoted figure is in Mr. Cuming's coll. (sine loco).

Var.  $\delta\delta$ . RUGULOSA.

*T. parva, alba, versus spiram pallidissime castanea, laxè contorta, subtilissime lirulata, latere inferno planiusculo lirato, præsertim aperturam versus, angulo externo carina acutiuscula, punctis ferrugineis fere æquidistantibus notata, angulo interno obtuso; rugæ et stricæ incrementi validæ, sigmoideæ, approximatae; spira uti præcedentis.*

Diam. ap. circ. 5 m.

*Hab.* Ins. Philippin. (Cuming).

A specimen not unlike Gualt. t. 10. f. Q, attached by the aperture to another specimen chiefly differing in its uniform pale-brown colour, more slender whorls (diam. 4 m.), and very feeble sculpture.

The spire is of the form of *Turritella carinifera*, Linn., like the preceding. This var. and the preceding approach to *V. tortuosus*.

Buonanni, f. 43 (spira parva) verisimiliter.

Var.  $\zeta$ . TERES.

*T. laxè contorta, latere interno albescente, externo badio, subtilissime longitudinaliter striata; anfr. 4 primi inferne plani, carina acutiuscula externa longitudinaliter lirata et conferte striata, latere externo longitudinaliter lirati et striati, superne obtuse angulati; anfr. ceteri teretiusculi, inferne obtusissime biangulati, rugis incrementi sigmoideis; apertura triangulari-ovata.*

Alt. 10 m., diam. 9 m.

*Spira turritelloidea gracilis; anfr. convexi, trilirati; liræ duæ medianæ in anfractibus primis æquales, lira superior minor in anfr. cæteris, evanescens in ultimo anfractu, lira tertia suturalis.*

Long. 10 m.

*Hab.* Ins. Philippin. (Cuming), from the specimen represented in Reeve's Conch. Syst.

*Vermiculus longus eleganti clavicula tortili desinens*, List. p. 548. f. 1.

*Tubulus anguinus*, Mart. i. t. 2. f. 12 B (copy).

*Serpula lumbricalis*, Wood, Index, t. 38. f. 1, Amboina (copy).

*Vermetus lumbricalis*, Reeve, Conch. Syst. t. 152. f. 1.

*Serpula*, Humphrey, Conchology, t. 10. f. 9.

*Vermetus lumbricalis*, Desh., Cuv. Regn. An. t. 62. f. 3.

*Vermetus indicus*, Rouss., Chenu, Ill. t. 5. f. 2 a.

*Hornschlange*, Rumph. t. 41. f. 1.

*Serpula lumbricalis*, Burrow, Elem. t. 22. f. 2.

*Vermiculus*, D'Argenv. t. 29. f. 1.

*Hab.* Ins. Philippin. (H. Cuming).

Notwithstanding the very different turritelloid portion, I doubt

whether this is specifically distinct, the var.  $\alpha$  showing a transition. A part of the keel shows some small, equidistant brown spots like those of the preceding variety.

*Serpula vermetus* of Sowerby's 'Genera,' seems to be most nearly allied to var.  $\alpha$ , chiefly by the spire. The operculum represented in the mouth of the shell, and the much smaller free specimens, are very likely rather inaccurate.

27. VERMICULUS SPIRATUS, Phil. 1836.

Var.  $\alpha$ . MELANOSCLERA.

*T. solida, badia, strigis transversis atris; anfr. obtuse quadrangulares; latere externo medio angulato, carina pallida, longitudinaliter lirulata; latere interno fortiter lirato, apertura subquadrangularis.*

Diam. 8-9 m.

*Hab.* Vera Cruz (*Rathsak*).

Var.  $\beta$ . QUADRANGULARIS.

*Rufescens.*

*Vermetus quadrangulus*, Phil. Mal. Zeitschr. 1848, p. 17. no. 77.

*Hab.* Yucatan (*Philippi*).

Var.  $\gamma$ . BICARINATA.

*Hornschlange*, Hühnerdarm, Knorr, iv. t. 17. f. 2.

*V. spiratus*, Phil. Wieg. Archiv. 1836, p. 244. t. 7. f. 5 a-c.

*V. knorrii*, Desh. Anim. s. vert. 1843, ix. p. 68.

*V. lumbricalis*, d'Orb. Hist. Nat. Cuba, p. 234.

*V. lumbricalis*, Bowd. Elem. p. 23. t. 9. f. 17. (1822).

*V. d'adanson*, Blainv. Man. 1825, t. 34. f. 1 (copy).

*V. lumbricalis*, Sow. Man. f. 345.

*V. indicus*, Chenu, Ill. t. 3. f. 2 (verisimiliter).

*Hab.* Havanna (*C. B. Philippi, d'Orb.*).

Var.  $\delta$ . CINEREA.

*Vermetus lumbricalis*, Gould, Invert. Massach. p. 287.

*Vermetus radricula*, Stimps. Shells of New Engl. p. 38.

*Vermetus radricula*, Gray, Guide, p. 126.

*Hab.* New Bedford Harbour (*Gould*); Buzzard's Bay southward (*Stimps.*).

Var.  $\epsilon$ . UNGULINA.

*Spira magna, turritelloidea, spiraliter striata et trilirata; liræ duæ infimæ subæquales, majores; umbilicus pervius; color castaneus.*

Long. 7 m., lat. bas. 8 m.; diam ap. circ. 4 m.

*Vermetus lumbricalis*, Woodward, Man. t. 9. f. 7, simillima.

*Hab.* Ins. St. Thomas (*A. H. Rüse*).

The spire of this shell is still larger, as in the quoted figure. I have never seen a depressed aperture, as in Woodward's plate; but a somewhat similar one is to be seen in Schwammerdam (t. 7. f. 5, 6).

It is very like in sculpture the last variety of *V. lumbricalis*. I have seen a specimen in which the three first whorls are angular and smooth, and the rest of the spire flat and trilirate.

Var. ζ. SCALARIS.

*T. castanea, tenuiuscula, laxe spiralis; anfr. teretiuseculi superne et inferne subplanulati unde obtusissime biangulati, longitudinaliter lirulati et striati; rugæ incrementi regulariter approximatae, conferte undulatae; stricæ incrementi interdum membranaceæ; spira parva, turritelloidea, pallida; anfr. primi obliqui, infra medium acutanguli, anfr. ult. carinis duabus æqualibus, basi concaviuscula.*

Diam. apert. 6 m.

*Serpula*, Humphrey, Conchology, t. 10. f. 5 & 7.

*Hab.* Ins. St. Thomas.

All the specimens show remains of sponges; they are all twisted in the same manner as the spongicole *Tenagodi*. The transverse undulated rugæ remind one very much of the varices of *Cirsostrema*. To this variety belongs, according to the original specimen, *Vermicularia glomerata*, var. 2 c (Gravenh. Tergestina, p. 61 c).

Var. η. TERES.

*Vermetus lumbricalis*, Pictorial Museum, f. 2820.

*Lumbricoid Vermetus*, Knight, Encyclop. 1856, iv. p. 1134. fig. (copy).

*Vermetus lumbricalis*, Illustrirte Naturg. f. 3743. p. 193 (copy).

A group affixed on a *Chama* (probably *C. macrophylla*) is very likely a variety of this species.

28. VERMICULUS ANGUIS, Forbes.

*Vermetus? anguis*, Forbes on Fossil Invert. from Southern India; Geol. Trans. vii. 3. p. 124. t. 13. f. 1 (1845-56).

Uncoiled spiral of two loose turns of angulated rugose whorls, spirally striated and semiplicated.

*Hab.* Pondicherry, cretaceous (*Grant*).

The sculpture of this shell is very like that of *V. spiratus*, var. ζ.

29. VERMICULUS COCHLEIFORMIS, Jos. Müller.

*Vermetus cochleiformis*, Müll. Mon. Aachener Kreide, 2. p. 6. t. 3. f. 3.

*Hab.* Greensand of Königsthorn on Lusberg and near Vaels (*Müller*).

Not unlike in shape some forms of *V. spiratus*, var. ζ. This and the preceding have very likely lived in sponges.

30. VERMICULUS? CIRCUMCARINATUS, Stoppani.

*Serpularia circumcarinata*, Stop. Pal. Lombard. t. 6. f. 4-6.

Fossil in triassic formation. This shell is perhaps more allied to *Eccyliomphalus*, Portlock.

31. VERMICULUS TURRITELLA, Rousseau.

*Vermetus turritella*, Rouss., Chenu, Ill. t. 4. f. 3.

*Vermetus turritella*, Rouss., Chenu, Man. p. 319. f. 2298 (copy).

This shell is perhaps most allied to *V. lumbricalis*, var.  $\beta$ ; it is very likely not full-grown.

32. VERMICULUS ROUYANUS, D'Orb., 1842.

*Vermetus rouyanus*, D'Orb. Ter. Cretac. 2. pl. 233. f. 5-7.

*V. rouyanus*, D'Orb., Chenu, Man. p. 319. f. 2296.

*Hab.* Couches aptiennes ou terrain néocomien sup. des bassins méditerranéen et parisien (D'Orb.).

33. VERMICULUS ALBENSIS, D'Orb., 1842.

*Vermetus albensis*, D'Orb. Ter. Cret. 2. p. 386. pl. 233. f. 8-9.

*Hab.* Couches aptiennes des environs d'Evry (Aube) (Dupin).

The descriptions of the last two species do not seem to correspond with the quoted figures; but whether the names on the plate or the diagnoses are displaced I cannot decide. It is doubtful if these two species are not *Turritellæ*, as neither of them is known in a distorted state.

34. VERMICULUS CARINATUS, Hörnes.

*Vermetus carinatus*, Hörnes, Geol. Reichsanst. 3. p. 486. t. 46. f. 17.

*Vermiculus triqueter*, Dujard. Mém. Géol. ii. p. 283.

*Vermetus adansonii*, Defr. Dict. Sc. Nat. lvii. p. 326 (nec Daud.).

*Serpula vermeti* aff., Sow. Gen. 1824, f. 4.

*T. trochiformi-acuminata, irregulari, anfractibus lævibus medio acute carinatis, supremis trochleiformibus, ultimo ad aperturam coarctato, basi linea elevata instructa, apertura rotundata.*

Long. 27 m., ap. 7 m. (Hörnes).

*Hab.* Tertiary formation of Steinbrunn and Lapagg (Hör.); Touraine (Sow. et Duj.); Thorigné near d'Angres (Defr.).

Sect. B. *Animal tentaculis longis subulatis; pallio simplici.*

*Operculum magnum planum. Testa anfractibus ampliatis.*

Professor Oersted's drawing of *V. eburneus* differs from the description of Stimpson in the long subulate tentacula, and in not showing any filaments at the brim of the mantle.

35. VERMICULUS DIMORPHUS, Mörch.

*Serpula*, Humphrey, Conchology, t. 10. f. 6.

*T. solida, spiraliter contorta, cinnamomeo cinereoque variegata; anfr. laxi, lateraliter connati et affixi, ampliati, teretiusculi, longitudinaliter confertissime striolati, latere externo convexiusculo, liris tribus inæqualiter remotis, latere inferno convexo lirato, liris regionis umbilicalis approximatis, interstitiis lirula parva intercalante, latere superiore plano albo liris destituto; rugæ et striæ incrementi rectiusculæ, unde indistincte cancellata; apertura orbicularis vel subtriangularis.*

Diam. 11 m.

*Spira turritelloidea, candida, anfr. planis confusis, triliratis, lira mediana valida compressa acuta.*

*Hab.* Ins. Philippin. (*H. Cuming*).

A specimen affixed to the tube of a *Rocellaria* (?). The sutures of the spire are very difficult to distinguish; it looks as if the two equal liræ between the two carinæ were situated on one and the same whorl.

? Var. *α*. LITUINA.

*T. irregulariter planorbiformis, anfr. latere affixo plano per totam longitudinem; latere libero tereti, liris inæqualibus planis, lira peripherica lata; latere interno liris confertis, interstitiis lirula intercalante; rugæ incrementi irregulares, approximatae; anfr. ultimus flavus, strigis confertis confluentibus lividis; apertura orbicularis, subangulata.*

Diam. 12–14 m.

*Hab.* Ins. Philippin. (*H. Cuming*).

A detached specimen, showing the cast of the denudated layers of a pearl-oyster, and exhibiting a feeble pearly lustre. Spire typical. I have found two specimens with about three detached whorls in a mass of *Petalonchus flavescens*, Carp., said to be from Sicily; they only differ in the colour being of a dull white, and not glossy white as in the two forms described.

36. VERMICULUS PELLUCIDUS, Brod. & Sow., 1829. (Pl. XXV. figs. 17–20.)

*T. pellucida, longitudinaliter striata, apicem versus carinata.*

The striæ, which become carinated towards the apex, are best seen in the young shell. The species in texture has somewhat the appearance of *Magilus*, Sow. & Brodr.

*Vermetus pellucidus*, Brodr. & Sow. Zool. Journ. iv. p. 369.

Var. *α*. PLANORBOIDES.

*Serpula regularis*, Chenu, Ill. t. 10. f. 14.

*T. tenuiuscula, irregulariter planorbiformis, lateraliter affixa; anfr. longitudinaliter pulcherrime dense striati et plano-lirati, liræ in anfr. primis fortiores, latere interno plano; apertura obliqua orbicularis, latere interno affixo.*

Diam. 9 m.

*Spira turritelloidea, anfr. vix convexiusculi, carina valida compressa acuta submediana, superne juxta suturam lira prominula et inferne lirula suturali in anfr. primis minutissima.*

A specimen without locality in Mr. Cuming's collection, a little smaller than the quoted representation; the affixed side shows some agglutinated shell-rudiments, and two or three flat marks, very likely, from the lustre, those of a *Margaritifera*.

Var. *αα*. LAQUEARIS.

*T. ut in præcedente, sed anfractus connati teretiusculi; anfr. ultimus*  
PROC. ZOOL. SOC.—1861, No. XII.

*ampliatus, tenuis, resupinatus; apertura orbicularis latere interno connato; rugæ incrementi irregulares, confertæ.*

Diam. ap. 15 m.

*Hab.* West Columbia (*Cuming*).

This shell differs from the preceding chiefly in having a whorl more, which is bent back and attached by the aperture to the penultimate whorl, giving it the appearance of the figure 8 or letter S.

Var.  $\beta$ . CINNAMOMINA.

*T. irregulariter planorbiformis; anfr. hic illic soluti, latere affixo plani, longitudinaliter subtilissime lirulati, et regulariter lirati, lira peripherica latiuscula; rugæ incrementi irregulares, unde obsolete nodulosæ in intersectionibus; anfr. ultimus aperturam versus pallide cinamominus, strigis transversis obscuris: spira ut præcedentis.*

Diam. ap. 14 m.

*Hab.* West Columbia (*Cuming*).

On the affixed side are agglutinated rudiments of shells and parts of an ochraceous stone, &c. This variety is very like the var. *a* of *V. dimorphus*, M.; it differs chiefly from the latter in its greater calibre and thinner shell. It is not impossible that the var. *lituina* belongs to this species, and that the locality Philippines is a mistake, particularly as the two small liræ on the spire are not quite equal, as in the three typical specimens of *V. dimorphus*.

Var.  $\gamma$ . VOLUBILIS (Pl. XXV. figs. 18 and 19).

*T. eburnea, subobesa, laxè volutata, longitudinaliter costata, costis distantibus, subobsoletis.*

Long.  $\frac{3}{16}$ , diam.  $\frac{1}{16}$  poll. (*Reeve*). "Mus. *Cuming*."

*Vermetus eburneus*, *Reeve*, Proc. Zool. S. 1842, p. 197; *Conch. Syst.* 2. p. 46. pl. 152. f. 2.

*Lumbricoid Vermetus*, *Pictorial Museum*, f. 2820.

*Vermetus lumbricalis*, *Knight*, *Encycl.* p. 1134; *Illustrirte Naturg.* f. 3741.

The three latter representations from the aperture are from the same specimen shown from the dorsal side in *Reeve's Conch. Syst.*

Var.  $\delta$ . VOLUBILIS (ADULTA) PICTA.

*Vermetus eburneus*, *Carp.* Cat. p. 304.

*T. candida, in parte anfr. ultimi flavescens, strigis lividis (6-7) transversis confertis; anfr. ultimus aperturam versus ampliatus.*

Long 35 diam., diam. testæ 18-20 m.

*Hab.* West Columbia (*Cuming*). Two aggregated specimens. *Puntarenas (Oersted: Mörch, Journ. de Conch. viii. p. 30).*

Var.  $\epsilon$ . CRASSA.

*Serpula panamensis*, *Chenu*, Ill. t. 10. f. 5.

*Vermiculus eburneus*, *Mörch*, *J. de Conch. viii. p. 30.*

*Liræ prominentes: animal viride, albo maculatum, unde reticulatum,*

*tentacula longa subulata, interrupte-lineata; proboscis brevis rotundata.*

*Hab.* Puntarenas (*Oersted*).

The diameter of the aperture is 10 to 10½ m.; the thickness of the shell 2 m. Fossil at Newburn, N. Carolina (*Carp.*).

Var. ζ. TIGRINA.

*T. solida, sordide flavescens, strigis transversis badiis confluentibus; anfr. obtuse quadrangulares, longitudinaliter expresse lirati, latere externo liris latioribus, latere superiore albo, liris destituto; lira peripherica lata; rugæ incrementi prominentes, confertæ, unde interstitiis hic illic foveolatis; apertura circularis, faucibus fuscis: spira sic ut præcedentis.*

Diam. ap. circ. 16 m.

*Hab.* West Columbia (*H. Cuming*).

Four agglomerated specimens of different size, showing on the flattened attached side remains of a grey sandstone. The colour, very like that of *Turritella tigrina*, Kien., gives this variety a very strange aspect; but the nearly white var. δ shows on a part of the whorl the same colour, but feebler.

Var. η. CASTANEA.

*Versus aperturam strigis albis.*

Diam. ap. 7 m.

A planorbiform specimen on a spine of *Murex melanoleucus*, Mörch. The numerous minute striæ which cover the liræ as well as the interstices, is nearly the only constant character.

The operculum is well described by Carpenter (*Cat.* p. 304) from specimens in Mr. Cuming's collection; but I have only found one specimen, labelled West Columbia, without shell; perhaps another may be found in the specimen figured by Reeve. I have not been able, even under the microscope, to discover the punctated lines mentioned by Carpenter.

*Operculum concaviusculum, laminis 3-4, latis, confertis, laceris, radiatim striatis, area centrali parva arcte spirali leviuscula; inferne planum, badium; impressio muscularis lira elevata peripherica terminata, confertissime concentricè lirulata; limbus nitidus tripartitus: zona interna lineis tribus concentricis, zona mediana latior convexiuscula, externa pallida tenuis flexilis.*

Diam. 9 m.; diam. impress. musc. 2¾ m.

*Hab.* West Columbia (*H. Cuming*).

Var. ι. from var. δ.

*Hab.* Puntarenas (*Oersted*).

Diam. apert. 15-16 m.

*Operculum superne planum, laminis confertis (detritis?) brevissimis; impressio muscularis liris concentricis confertis subirregularibus, lira elevata terminata, centro immerso; limbus nitidus, tripartitus; zona interna angustior excavata, externa pallida angusta subreflexa.*

Diam. 12 m., impress. musc. 4½ m.

*Vermetus hindsii*, Gray, Adams, Gen. t. 38. f. 8 a, b?

Var. 2. DISCIFER, from var.  $\delta$ .

*Hab.* Puntarenas (Oersted): a smaller specimen.

*Operculum superne laminis brevibus detritis, centro disco pallido prominulo plano, concentricè confertissime striolato; inferne planum, badium; area centralis irregulariter concentricè lirata.*

Diam. 11 m., diam. impress. musc. fere 5 m.

Var. 3, from var.  $\epsilon$ , of which the animal is described, fig. 17.

Diam. 10 m., diam. impress. musc.  $3\frac{1}{2}$  m.

The muscular impression is proportionately much larger than that of the first described, which is much thinner.

Var. 4. SUBGRANOSA, from var.  $\eta$ .

*Operculum superne concaviusculum, lamina concentrica juxta peripheriam, laminis medianis obliteratedis, inferne badium; impressio muscularis conferte granuloso-rugosa (an morbo?), canali irregulari circumdata; zona interna rugis obliquis approximatis.*

Diam. 6 m., impress. musc.  $2\frac{1}{2}$  m.

On the surface are some cylindrical detached bodies like blunt spines, which look as if they were broken off at the base, but I believe they scarcely belong to the operculum.

*Operculum testæ juvenilis.*

Diam. aperturæ 3 m.

*Hab.* Puntarenas (Oersted).

*Op. inferne spiraliter liratum; impressio muscularis indistincte terminata, annulo centrali.*

Diam.  $2\frac{1}{2}$  m.

The operculum is very variable, it varies from black to pale brown; the channel surrounding the muscular impression becomes deeper with age, whilst it is very indistinct in the young state. The radiating striæ of the *laminæ* form small denticles in the border if looked at under the microscope. The operculum of *Serpula panamensis*, represented by M. de Serres, Ann. Sc. Nat. 1855, v. p. 243. t. 8. f. 7, is perhaps of this species; but fig. 8 is very likely erroneous.

#### Sect. C. *Spira minuta helicoidea.*

The two following species are referred to this genus on account of the operculum, notwithstanding the very different form of the shell.

#### 37. VERMICULUS RASTRUM, Mörch.

*T. lateraliter affixa, laqueatim contorta, alba pallide flavescens; anfr. semiteretes, inæquales, marginibus dilatatis, superne liris 10-12 compressis, squamas confertas fornicatas amplectentibus, interstitiis lira plana interdum duplicata, squamis confertissimis arcuatis brevibus, anfr. ultimo juxta aperturam libero, cylindrico, coarctato; apertura circularis.*

*Operculum superne concaviusculum, laminis laciniatis confertissimis, centro conferte lirulato leviusculo; inferne planiusculum, badium;*

*impressio muscularis conferte lirata, opaca, peripheria leviter impressa; limbo nitido tripartito; zona interna sulcis 2-3 spiralibus, mediana parva vix sulcata, externa tenuis flavescens reflexa.*

Diam.  $9\frac{1}{4}$  m., impress. musc. fere 3 m., apert. testæ 9 m.

*Aletes* not unlike *A. squamigerus*, Carp. Cat. p. 304, lin. 28 (coll. Cuming.), sine loco.

The operculum is very like that of *V. eburneus*; but the muscular impression is not limited by an elevated line and flat channel. The affixed side shows four or five diverging channels, very likely the impression of the branches of a *Gorgonia*: on a part where the outer shell is broken is to be seen a very long oblique septum, perhaps pathological. The first whorls are lost; but a specimen from Puntarenas (*Oersted*) seems to correspond with it very well, only the scales are much feebler; its nuclear shell is helicoid and glossy. Another specimen from the same locality, perhaps even the latter whorls of the same specimen, has six to eight marked liræ, with three close-set small liræ in the interspaces. The scales are very numerous, small, and close-set; the colour is ferruginous, variegated with a foreign green hue.

Diam. of aperture 6-7 m.

The striæ of growth of *V. eburneus* are sometimes raised; but I have not seen them forming scales.

### 38. VERMICULUS EFFUSUS, Valenc.

*Vermetus effusus*, Val., Chenu, Ill. pl. 5. f. 4 a-c; Mörch, J. de Conch. viii. p. 38.

*Siphonium effusum*, Chenu, Man. p. 320, f. 2301.

Fig. 4 of Chenu is taken from the very same specimen represented as *V. centiquadrus* in 'Voy. de Vénus'; the specific name seems best to suit fig. 4 a. The lid, if represented of the natural size, seems too large for the shell.

### EXPLANATION OF PLATE XXV.

- Fig. 1. *Stephopoma tricuspe*. Spine of operculum.  
 2. *Stephopoma senticosum*. Spine of operculum.  
 3, 4, 5. *Stephopoma pennatum*. Shell.  
 6, 7. *Stephopoma pennatum*. Operculum.  
 8. *Stephopoma pennatum*. Spine of operculum.  
 9. *Stephopoma pennatum*, var. *bispinosa*. Operculum.  
 10. *Stephopoma pennatum*, var. *bispinosa*. Spine of operculum.  
 11. *Stephopoma roseum*. Spine of operculum.  
 12. *Siphonium (Dendropoma) megamastum*. Operculum.  
 13. *Siphonium (Dendropoma) megamastum*. Spine of operculum.  
 14. *Stephopoma senticosum*. Young shell.  
 15. *Siphonium (Stoa) subcrenatum*, var. *spinosa*. Operculum.  
 16. *Siphonium (Stoa) subcrenatum*, var. *spinosa*. Spine of operculum.  
 17. *Vermiculus pellucidus*, var. *volubilis*.  
 18, 19. *Vermiculus pellucidus*, var. *volubilis*. Shell.  
 20. *Vermiculus pellucidus*, var. *volubilis*. Operculum.

April 23rd, 1861.

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

Mr. Gould made some remarks on a species of Woodpecker from Siam, which he believed to be referable to the *Meiglyptes jugularis* of Blyth.

The following papers were read :—

1. DESCRIPTION OF A NEW SPECIES OF THE FAMILY CAPRIMULGIDÆ. BY JOHN GOULD, ESQ., F.R.S., ETC.

CHORDEILES? PUSILLUS.

Crown of the head, back, and lesser wing-coverts dark brown; mottled with grey and rufous, produced by each feather being crossed by interrupted bars of grey on the basal three-fourths, and with rufous near the tip; the greater wing-coverts, tertiaries, and scapularies are similarly marked, but the bands are larger and more freckled, and are mingled grey and rufous, these feathers are also largely tipped with rufous; primaries very dark brown, the three outermost crossed at about two-thirds from their base with a broad band of white, which on the fourth feather assumes the form of a large oval spot; the remaining primaries are marked near their bases with buffy white; upper tail-coverts brown crossed by irregular bands of buffy grey, and encircled with rufous at the tip; two central tail-feathers the same, the lateral ones brown, crossed by bands for three parts of their length from their base, and the two on each side next the central ones with a large spot of white at the tip; on the throat a large arrow-head-shaped mark of white; feathers of the chest brown, tipped with buff, forming a band across this part of the body; under surface crossed by numerous narrow, blackish-brown and greyish-white bars, which latter become larger and whiter as they proceed towards the vent; under tail-coverts white; tarsi naked and, with the feet, mealy-brown.

Total length  $5\frac{1}{2}$  inches; wing 5; tail  $2\frac{1}{2}$ ; tarsi  $\frac{1}{2}$ .

*Hab.* Supposed to be Bahia.

*Remark.*—This is by far the smallest Goatsucker I have ever seen, the size of its body not exceeding that of a common Sparrow (*Passer domesticus*). Its gape is entirely destitute of bristles. I believe I have placed it in the right genus; at the same time I may observe that the wings are more curved, and the primaries less resistant, than in the other members of the genus *Chordeiles*. It is doubtless a fully adult male.

2. NOTE ON THE EGG OF THE PIPING CROW OR MAGPIE OF NEW SOUTH WALES (*GYMNORHINA TIBICEN*). BY GEORGE BENNETT, M.D., F.Z.S.

It is not uncommon for eggs of the same species of bird to vary so much both in form and colour, as to cause doubts to arise in the minds of ornithologists as to the possibility of their being produced by the same species. This has been well exemplified in the case of the Red-tailed Tropic Bird (*Phaëton phoenicurus*) more particularly, as well as in others. On examining a number of eggs of the Piping Crow (*Gymnorhina tibicen*), at Sydney, N. S. Wales, I was surprised to observe in how many instances they differed, both with respect to their form as well as in the markings of colour, so as to appear to belong to distinct species, although those differing so much both in form and colour were procured from the nest of the same bird.

The eggs I had so recently an opportunity of carefully examining were collected by two zealous young naturalists, Mr. Edward Ramsey and Mr. Henry Norton. The former gentleman has sent me his notes on the eggs of the Australian Magpie, from which I have collected the following information. He states that "the Piping Crow (*G. tibicen*) lays eggs differing from one another in the same nest, both in form and colour; some being long and others round, and the coloured spots varying very much. On August 25th, 1860," he says, "the first Magpie's eggs were taken this season. I have six varieties of the eggs of this bird; and so much do they differ from each other, that, had I not taken them from the nest, I could not have believed they were the eggs of the same bird. All the young birds I have taken from the nest have had the breast of a dull-brown colour; and a young bird brought home from the nest in 1859 is now (1860) changing the plumage of the breast from the dull-brown colour to black."

3. NOTE ON THE GENUS *BASILORNIS*.

BY G. R. GRAY, F.L.S., ETC.

The genus *Basilornis* was established some years back by the late Prof. Temminck on a bird from Celebes. Since then Mr. Wallace has met with another species in his wanderings in Ceram. As there exists some confusion with regard to these two species, I have thought it right to address to the Society a few remarks on them, with a view of pointing out their distinctive characters. They are easily distinguished from one another by the form of their crests. That of Celebes possesses a short, compressed, keel-like crest, which extends from the culmen to behind the head, and is composed entirely of scale-like and convex feathers; whilst that of Ceram has an occipital, erect and elongated crest, which, when viewed sideways, assumes somewhat of a subtriangular form, and is composed of truncated, rather broad and lax plumes. It also differs in having the nostrils exposed and a naked space round each eye. In the species of Celebes

the nostrils are covered by the frontal plumes, and there is scarcely any naked space round the eyes.

Wagler in 1827 described a bird from Java (?) under the name of *Pastor corythaix*, the characters of which agree with the Ceram and not the Celebes species, with which it has been confounded by Pr. Bonaparte and other writers.

The specific characters of the two species are subjoined—viz.



Fig. 1.

**BASILORNIS CORYTHAIX** (fig. 1).

Top of the head rich glossy purplish black ; crest bronzy black ; nape, back, and beneath the body glossy chalybeous ; wings fuscous, paler at the base of the inner web ; tail bronzy black, with the outer feathers black with green edges ; spot below each eye, a patch on each side of breast, and some scattered hairs on the throat, white.

*Pastor corythaix*, Wagl. Syst. Av.

*Basilornis corythaix*, Pr. B. Consp. Av. p. 420.

*Hetærornis corythaix*, G. R. Gray, Gen. of B. ii. p. 335.

*Hab.* Ceram (*Wallace*).

**BASILORNIS CELEBENSIS** (fig. 2).

Head rich glossy steel black ; crest rich glossy purplish black ; back, breast, and abdomen chalybeous ; quills fuscous black ; tail bronzy black, with the outer feathers greenish black ; a spot beneath

each eye, and a patch on each side of breast, white, partly tipped with buff; throat with some scattered white plumes, hair-like at base and dilated at the tip of each; nape and upper part of back furnished with a few scattered buff plumes.

*Basilornis celebensis*, Temm. MS.

*Basilornis corythaix*, p., Pr. B. Consp. Av. p. 420 (descrip.).

*Hab.* Celebes (Menado, Makassar) (*Wallace*).



Fig. 2.

4. ON A NEW SPECIES OF THE GENUS COPSYCHUS FROM BORNEO. BY P. L. SCLATER, M.A., PH.D., SECRETARY TO THE SOCIETY.

COPSYCHUS SUAVIS.

*Nigro-sericea, alis extus fusciscentioribus; abdomine saturate castaneo; dorso imo et caudæ reatricibus lateralibus candidis, harum quatuor mediis et proximæ utrinque pogonio interiore nigris: rostro nigro, pedibus pallide fuscis.*

Long. tota 9·0, alæ 4·0, caudæ 4·5.

*Hab.* In Borneo meridionali.

*Obs.* Affinis *Copsycho macruro*, sed statura majore, cauda brevior et reatricum pictura diversus.

I have selected two examples of this pretty species of *Copsychnus* out of a small collection of bird skins from Banjermassing in Southern Borneo, now in the hands of Mr. S. Stevens. Its nearest ally is that well-known beautiful songster the *Copsychnus macrurus* of India, from which, however, it is readily distinguished by its larger size, shorter tail, and the three lateral retrices, as well as the outer web of the next pair, being wholly of a pure white. There are, however, blackish edgings at the base of the inner web of the second and third pair in one of the specimens, which I take to be a male. In the other, which is probably the female, these are absent, and the three

external pairs of rectrices are wholly white, the belly is paler chestnut, the plumage above more dusky, and the size smaller.

I think this species having the tail of *Copsychus* and the colours of the so-called genus *Kittacincla*, justifies us in uniting these two groups, which, as far as I can see, only differ in the elongation of the tail in the latter. The following appear to be the described species of the group.

#### a. COPSYCHUS.

##### 1. COPSYCHUS SAULARIS

(*Gracula saularis*, Linn. — *Copsychus saularis*, Wagl. ; Moore, Cat. B. E. I. C. i. p. 275.—*Gryllivora intermedia*, Sw.), from continental India (where it is one of the best-known birds), Nepal, Arakan, and Tenasserim.

##### 2. COPSYCHUS CEYLONENSIS

(*Gryllivora brevirostris*, Blyth, J. A. S. B. xvi. p. 139, et Cat. p. 166, nec Swainson), from Ceylon, is stated by Mr. Blyth to be invariably distinguishable from peninsular specimens, and as such would require a separate name, Swainson's term '*brevirostra*' being referable to the Javan species.

##### 3. COPSYCHUS MINDANENSIS

(*Turdus mindanensis*, Gm.—*Copsychus mindanensis*, Blyth, *l. c.* —*Lanius musicus*, Raffles.—*Gryllivora intermedia* et *G. rosea*, Sw.) replaces *C. saularis* in Malacca, and extends apparently into Siam, the Philippines (if *Turdus mindanensis* is really referable here), and China. At Amoy it is said by Mr. Swinhoe (see '*Ibis*,' 1860, p. 54) to be a "common resident."

##### 4. COPSYCHUS AMÆNUS

(*Turdus amœnus*, Horsf. Trans. Linn. Soc. xii. p. 147.—*Copsychus amœnus*, Moore, Cat. p. 279.—*Gryll. brevirostra*, Sw.) is the Javan representative species of the true *saularis* group.

##### 5. COPSYCHUS PLUTO

(Temm. in Mus Lugd. ; Bp. Consp. p. 267 ; Hartl. Cab. Journ. f. Orn. 1853, p. 34) inhabits Borneo and Labuan. Specimens from the latter locality, collected by Mr. Motley, are in Mr. Dillwyn's collection.

##### 6. COPSYCHUS LUZONIENSIS.

(Bp. Consp. p. 267.—*Turdus luzoniensis*, Kittlitz, Mém. prés. Acad. Sc. Pet. ii. p. 5. pl. 7. 1835) is a beautiful species from the Philippines (Island of Luzon), of which there are examples in the British Museum and Mr. Gould's collection.

β. KITTACINCLA.

7. *COPSYCHUS SUAVIS*, described above, from Southern Borneo.

8. *COPSYCHUS MACRURUS*

(*Turdus macrurus*, Gm.—*Copsychus macrurus*, Wagler.—*Kittacincla macrura*, Gould.—*Gryllivora longicauda*, Sw.) is the well-known Shámá of Bengal, and renowned for its song. It is found in India, Ceylon, the Malay countries, Sumatra, Java, and as far east as Siam, whence M. Mouhot has lately transmitted the specimen which I now exhibit.

9. *COPSYCHUS STRICKLANDI*

(Motley and Dillwyn, Nat. Hist. Labuan, p. 20 cum fig.), from Labuan, is easily distinguished from the preceding by its white head.

10. *COPSYCHUS ALBIVENTRIS*

(*Kittacincla albiventris*, Blyth, J. A. S. B. xxvii. p. 269), lately described by Mr. Blyth, from the Andaman Islands.

The preceding are the only Asiatic species that I have any knowledge of. *Copsychus pica* (v. Pelz. Sitz. Akad. Wien, xxxi. p. 323; Hartl. Orn. Beitr. Madagascar. p. 38), from Madagascar, must be accurately examined and compared before being allowed a place in the same genus.

5. SECOND LIST OF SIAMESE REPTILES. BY DR. ALBERT GÜNTHER, FOR. MEM. ZOOL. SOC.

Having examined the Saurians, Ophidians, and Batrachians of M. Mouhot's collection, lately transmitted from Chartaboum, on the coast of Siam, to this country, I shall first describe the new species, and then add a complete list of the whole series. Typical specimens of them have been retained for the British Museum.

1. *DRACO TÆNIOPTERUS*.

Tympanum not scaly; nostrils above the face-ridge, directed upwards; a low longitudinal fold on the neck. Scales on the back of equal size, obscurely keeled. Gular sac covered with large smooth scales, uniformly coloured. Wings dark-greenish olive, with five arched black bands, not extending to the margin of the wing, some being forked at the base.

2. *ACANTHOSAURA CORONATA*.

The upper orbital edge serrated, without elongate spine posteriorly; a short spine on each side of the neck; a yellowish-olive band, edged with black across the crown, from one orbital edge to the other; an oblique, short, yellowish band, broadly edged with brown, from below the orbit to the angle of the mouth.

This and the following species belong to the genus *Acanthosaura*, as defined by Dr. Gray (Catal. Liz. p. 240). The tympanum is distinct; a short spine between it and the dorsal crest, which is rather low. No femoral or præanal pores. A short spine behind the orbital edge, and separated from it by a deep notch. Back and sides covered with small, smooth scales, slightly turned towards the dorsal line, and intermixed with scattered larger ones, which are keeled; belly and legs with larger, keeled scales. Tail slightly compressed at the base, the rest being round and without crest; all its scales are keeled, those on the lower side being oblong and provided with more prominent keels. Throat without cross-fold and without distinct longitudinal pouch; a slight oblique fold before the shoulder.

### 3. ACANTHOSAURA CAPRA.

The upper orbital edge not serrated, terminating posteriorly in a long moveable horn; no spine above the tympanum or on the side of the neck. Nuchal crest high, not continuous with the dorsal crest, which is rather elevated anteriorly. Crown and cheek without markings.

The tympanum is distinct; no femoral or præanal pores. Back and sides covered with small, smooth scales, which become gradually larger and more distinctly keeled towards the belly; no large scales intermixed with the small ones, only a few appear to be a little larger than the rest. Tail slightly compressed at the base, surrounded by rings of oblong, keeled scales. Throat expansible; a very slight fold before the shoulder.

### 4. DILOPHYRUS MENTAGER.

Dorsal crest not interrupted above the shoulder, interrupted above the hip; caudal crest as high as that on the back; no large scales on the side of the neck; sides of the throat with large convex or tubercular scales.

This species belongs to the genus *Ditophyrus*, Gray (Catal. Liz. p. 238). A high crest, composed of sabre-shaped shields, extends from the nape of the neck to the second fifth of the length of the tail, being interrupted above the hip. Scales on the back and the sides of equal size, very small, with an obscure keel obliquely directed upwards; those on the belly smooth, on the lower side of the tail rather elongate, strongly keeled. Tympanum distinct. Throat with a cross-fold. Orbital edges and sides of the neck without spines. Tail transversely banded with black.

One stuffed specimen is 30 inches long, the tail taking 21.

### 5. TROPIDOPHORUS MICROLEPIS.

Snout rather narrow and produced. Scales on the back strongly keeled, the keels not terminating in elevated spines. Back of the tail with two series of moderately elevated spines, the series not being continuous with those on the back of the trunk. Scales of the throat smooth, or very indistinctly keeled. Tail with a series of plates below, which are much larger and broader than the scales of the

belly. Three large præanal scales. A single anterior frontal shield (internasal) \*.

#### 6. SIMOTES TÆNIATUS.

Scales in nineteen rows. Brownish-olive, with a brown longitudinal dorsal band enclosing an olive-coloured line running along the vertebral series of scales; another brownish band along the side of the body; belly whitish, chequered with black.

One loreal shield; one anterior and two posterior oculars; eight upper labials, the third, fourth and fifth of which enter the orbit; 155 ventral plates; anal entire; 44 pairs of subcaudals. Head with the markings characteristic of the genus; each half of the dorsal band occupies one series of scales and two halves; the lateral band runs along the fourth outer series, touching the third and fifth.

We were previously (Proc. Zool. Soc. 1860, p. 113) enabled to enumerate 25 species of Siamese Reptiles, which number is raised to 42 by the following list.

Those which have been mentioned in the account of the first collection are marked with an asterisk.

- |  |   |
|--|---|
| 1. <i>Dracunculus maculatus</i> ,<br>Gray.     | 12. <i>Hemidactylus frenatus</i> ,<br>Schleg.       |
| 2. <i>Draco tæniopterus</i> , Gthr.            | *13. <i>Gecko verus</i> , Merr.                     |
| 3. <i>Bronchocela cristatella</i> ,<br>Kuhl.   | 14. <i>Cylindrophis rufa</i> , Laur.                |
| 4. <i>Acanthosaura armata</i> ,<br>Gray.       | 15. <i>Python reticulatus</i> , Schneid.            |
| 5. — <i>coronata</i> , Gthr.                   | 16. <i>Simotes tæniatus</i> , Gthr.                 |
| 6. — <i>capra</i> , Gthr.                      | 17. <i>Homalopsis buccata</i> , L.                  |
| *7. <i>Calotes versicolor</i> , Daud.          | *18. <i>Tropidonotus quincunciatus</i> ,<br>Schleg. |
| 8. <i>Dilophyrus mentager</i> , Gthr.          | 19. <i>Dendrophis picta</i> , Gm.                   |
| 9. <i>Leiolepis bellii</i> , Gray.             | 20. <i>Rana tigrina</i> , Daud.                     |
| 10. <i>Tropidophorus microlepis</i> ,<br>Gthr. | *21. <i>Oxyglossus lima</i> , Tschudi.              |
| 11. <i>Platyurus schneiderianus</i> ,<br>Shaw. | *22. <i>Bufo melanostictus</i> , Schu.              |
|  | *23. <i>Polypedates maculatus</i> ,<br>Gray.        |

\* This is the third species of *Tropidophorus*. The two others are:—

1. TROPIDOPHORUS COCHINCHINENSIS (Cuv.): Dum. Bibr. v. p. 556. pl. 57.  
f. 1.—*Tropidosaurus montanus*, Gray in Griffith, Anim. Kingd. ix. App. p. 35.

Snout rather obtuse. Scales on the back strongly keeled, the keels terminating in slightly elevated spines. Two series of moderately elevated spines along the middle of the back of the tail, the series being continuous with those on the back of the trunk. Tail with a band of large hexagonal plates below; two large præanal scales. Two pairs of anterior frontal shields.

Cochinchina.

2. TROPIDOPHORUS GRAYI, n. sp. (*T. cochinchinensis*, Gray, not Cuv.).

Snout rather narrow and produced. Scales on the back as well as those on the tail with an exceedingly strong, lamelliform keel, elevated and spinous posteriorly. Two series of spinous keels on the back of the tail, continuous with those on the back of the trunk. Tail with rhombic scales below, which are not much larger than those of the belly. Scales of the throat strongly keeled. Three large præanal scales. Two pairs of anterior frontal shields.

Philippine Islands. Three specimens in the British Museum.

6. DESCRIPTIONS OF NEW LAND-SHELLS, IN THE COLLECTION OF H. CUMING, ESQ. BY DR. LOUIS PFEIFFER.

1. *HELIX URANUS*, Pfr. (§ 28, n. 394 a). *T. subclausa perforata, depressa, solida, conferte leviter striata, et striis inæqualibus concentricis subtiliter decussata, castanea; spira parum elevata, obtusa; sutura levissima; anfr. 4½, vix convexiusculi, regulariter accrescentes, ultimus non descendens, carinatus, basi antice subinflatus; apertura perobliqua, rhombea, intus cærulescenti-albida; perist. rectum, marginibus callo subflexuoso junctis, subparallelis, basali arcuato, subincrassato, ad perforationem dilatato, adnato.*

Diam. maj. 68, min. 57, alt. 28 mill.

*Hab.* Polillo Islands (Mr. Porte).

2. *HELIX NEPTUNUS*, Pfr. (§ 33, n. 594 a). *T. mediocriter umbilicata, depressa, solidula, striis incrementi et lineis spiralibus subtilissime foveolata, fulva, nitidula; spira breviter conoidea, obtusula; anfr. 5½, convexiusculi, ultimus non descendens, inflatus, periphæria obsolete subangulatus, subtus interdum fasciis nonnullis angustis rufescentibus pictus; apertura obliqua, late lunaris, intus nitide margaritacea; perist. simplex, rectum, marginibus subconniventibus, basali non dilatato, columellari leviter fornicato-reflexo.*

Diam. maj. 74, min. 63, alt. 41 mill.

*Hab.* Siam (M. Mouhot).

This shell is evidently allied to the still unknown *H. pernobilis*, Fér. (pl. 74. f. 4 = *Limax lampas*, Martyn), and appears to differ from that figure only by its greater size, the obsolete keel, and the lower part of the peristome not being broadly reflected.

3. *HELIX LACTIFLUA*, Pfr. (1276 a). *T. imperforata, globosotrochiformis, tenuis, leviter striata, alabastrina, strigis filiformibus lacteis fere obducta; spira turbinata, vertice obtuso; anfr. 4, convexi, ultimus non descendens, infra medium subcarinatus et fascia opaca cretacea cinctus; apertura fere diagonalis, rhombeo-lunaris; perist. album, undique expansum, et reflexiusculum, margine supero antrorsum flexuoso, columellari valde dilatato, adnato, intus angulatim descendente.*

Diam. maj. 24½, min. 20, alt. 17 mill.

*Hab.* New Georgia (Mr. Macgillivray).

4. *HELIX POLILLENIS*, Pfr. (n. 1306 a). *T. imperforata, ovato-conoidea, solida, striata, castanea; spira convexo-conoidea, obtusula; anfr. 5, modice convexi, summi pallidi, interdum castaneo-unifasciati, penultimus albo-strigatus, ultimus epidermide crassiuscula subhydrophana fusculo-albida fere omnino obductus; columella subdeclivis, parum arcuata, compressa, lata; apertura obliqua, lunato-ovalis, intus cærulescenti-alba; perist. album vel rubellum, breviter incrassato-expansum, marginibus convergentibus, dextro subflexuoso.*

Diam. maj. 47, min. 38, alt. 38 mill.

β. *Minor, castanea, superne pallidior et fasciata, anfractibus 2, ultimis epidermide albida vel fuscula fasciatis et strigatis.*

Diam. maj. 42, min. 35, alt. 35 mill.

*Hab.* Polillo Islands (*Mr. Porte*).

5. *HELIX PORTII*, Pfr. (n. 1308 a). *T. imperforata, globoso-conoidea, tenuiuscula, striatula, pallide lutescens, ad suturam fascia nigro-castanea ornata; spira convexo-elata, obtusa; anfr. 5, convexiusculi, summi nudi, albidii, ultimi strigis copiosis epidermidis hydrophanæ albidæ picti, ultimus ventrosus, non descendens; columella alba, vix arcuata, compressa, excavata, area nigricante cincta; apertura obliqua, rotundata lunaris, intus margaritaceo-alba; perist. breviter reflexum, margine dextro antrorsum subflexuoso.*

Diam. maj. 44–45, min. 37, alt. 36 mill.

*Hab.* Polillo Islands (*Mr. Porte*).

6. *HELIX AJAX*, Pfr. (n. 1342 a). *T. imperforata, conoideo-globosa, solidula, striatula, nigro-castanea, fasciis et strigis epidermidis hydrophanæ albidæ dense reticulata; spira convexo-conoidea, apice pallida, obtusula; anfr. 4½, convexiusculi, regulariter accrescentes; columella alba, lata, compressa, obliqua; apertura parum obliqua, rotundato-lunaris, intus margaritaceo-micans; perist. album vel rubellum, undique breviter expansum, marginibus convergentibus, basali cum columella angulum obsoletum formante.*

Diam. maj. 42, min. 35, alt. 30–31 mill.

*Hab.* Polillo Islands (*Mr. Porte*).

7. *HELIX HECTOR*, Pfr. (n. 1349 a). *T. imperforata, subglobosa, tenuis, striatula, straminea, castaneo-plurifasciata, epidermide hydrophana lactea strigatim fere obducta; spira brevis, convexa, obtusula; anfr. 4, convexiusculi, summi nudi, carneo-fulvi, ultimus subdepresso-rotundatus, antiæ vix descendens; columella tenuissima, fere verticalis, subtruncata; apertura obliqua, rotundato-lunaris, intus lutescens, castaneo late trifasciata; perist. simplex, tenue, undique breviter expansum.*

Diam. maj. 38, min. 31, alt. 27 mill.

*Hab.* Polillo Islands (*Mr. Porte*).

8. *HELIX ANDROMACHE*, Pfr. (n. 1349 b). *T. imperforata, subglobosa, tenuiuscula, striatula, castanea, parum nitens; spira convexa, vertice minuto; anfr. 4–4½, modice convexi, summi albidii, penultimus fulvicans, ultimus globosus, non descendens, interdum liris spiralibus leviter cinctus; columella alba, subverticalis, compressa; apertura obliqua, lunato-rotundata, intus margaritacea; perist. simplex, albidum, undique breviter expansum, marginibus convergentibus, dextro subflexuoso.*

Diam. maj. 37, min. 30, alt. 28 mill.

*Hab.* Polillo Islands (*Mr. Porte*).

9. *HELIX LEUCOTHÖE*, Pfr. (n. 1631 a). *T. anguste umbilicata, trochiformis, tenuiuscula, striatula, superne striis antrorsum descendentibus, subtus striis subconcentricis sublente decussatula, albida; spira turbinata, apice obtusula; anfr. 4½, convexi, ultimus antice vix descendens, periphæria acute carinatus, subtus prope carinam castaneo-unifasciatus, minus convexus; apertura diagonalis, rhombeo-lunaris; perist. expansum, margine supero tenui, basali medio incrassato, columellari dilatato, purpurascente.*

Diam. maj. 20½, min. 17, alt. 12½ mill.

*Hab.* New Georgia (Mr. Macgillivray).

10. *HELIX XANTHOCYLA*, Pfr. (n. 1641 a). *T. oblique perforata, trochiformis, tenuiuscula, sublævigata, alabastrina, nitida, diaphana; spira conica, vertice minuto, fusculo; anfr. 6½, superiores planiusculi, penultimus convexiusculus, ultimus subinflatus, non descendens; columella tumida, vix declivis; apertura diagonalis, lunato-ovalis; perist. luteum, undique late expansum et reflexiusculum, margine columellari subflexuoso.*

Diam. maj. 33, min. 26, alt. 36 mill.

*Hab.* Salomon Islands.

11. *HELIX GROSSULARIA*, Pfr. (n. 1689 a). *T. angustissime umbilicata, turbinato-depressa, tenuiuscula, striis incrementi confertissimis antrorsum descendentibus decussata, pallide isabellina, maculis carneis subfasciatim dispositis variegata; spira conoidea, vertice subtili; anfr. 4½, modice convexi, ultimus subinflatus, antice breviter descendens; apertura obliqua, sinuato-lunaris; perist. album, marginibus convergentibus, dextro anguste expanso, antrorsum flexuoso, basali reflexo, columellari superne fornicatim dilatato.*

Diam. maj. 18, min. 16, alt. 12 mill.

*Hab.* New Georgia (Mr. Macgillivray).

12. *HELIX CERAMENSIS*, Pfr. (n. 1879 a). *T. umbilicata, depressa, tenuiuscula, leviter striata, unicolor castanea; spira plana, medio vix immersa; sutura mediocris; anfr. 5½, primi convexi, sequentes convexiusculi, ultimus subdepresso rotundatus, antice descendens, subtus in umbilicum sensim attenuatus; apertura obliqua, dilatata, rotundato-lunaris, intus lilaceo-margaritacea; perist. tenue, expansum, marginibus conniventibus, supero prope insertionem impresso, columellari parum dilatato, patente.*

Diam. maj. 37, min. 29, alt. 14-15 mill.

*Hab.* Island of Ceram (Mr. Wallace).

13. *HELIX ERINACEUS*, Pfr. (n. 1880 a). *T. mediocriter umbilicata, depressa, tenuis, foveolato-striata pilisque brevibus rigidis obsita, rufescens; spira plana; anfr. 4½, convexi, ultimus leviter descendens, inflatus, circa umbilicum infundibuliformem compressus; apertura obliqua, rotundato-lunaris, intus marga-*

*ritacea; perist. tenue, liiaceo-fuscum, nitidum, expansum, marginibus convergentibus, callo tenui junctis, columellari dilatato.*  
 Diam. maj.  $25\frac{1}{2}$ , min. 21, alt. 15 mill.  
*Hab.* New Georgia (*Mr. Macgillivray*).

14. *HELIX MARTENSI*, Pfr. (n. 1886 a). *T. umbilicata, depressa, tenuiuscula, striatula, diaphana, unicolor castanea; spira plana, medio subimmersa; anfr.  $4\frac{1}{2}$  convexi, ultimus tumidus, juxta suturam et ad peripheriam obsolete subangulatus, antice descendens, subtus sensim in umbilicum mediocrem attenuatus; apertura fere diagonalis, irregulariter rotundato-lunaris; perist. rubello-albidum, anguste reflexum, marginibus convergentibus, columellari vix dilatato, patente.*

Diam. maj.  $18\frac{1}{2}$ , min. 16, alt.  $7\frac{3}{4}$  mill.

*Hab.* Island of Ceram (*Mr. Wallace*).

15. *HELIX EUTERPE*, Pfr. (n. 1062 a). *T. subclausa perforata, depressa, solida, conferte radiato-striata striisque spiralibus exilissimis undique subgranulata, sericea, albido-carnea; spira breviter conoidea, obtusula; anfr. 6 vix convexiusculi, regulariter accrescentes, ultimus rotundatus, supra medium obtuse angulatus; apertura fere verticalis, oblique lunaris, intus margaritacea; perist. intus albo-callosum, margine supero brevi, recto, basali reflexiusculo, ad perforationem lente ascendente, vix dilatato.*

Diam. maj. 28, min. 25, alt. 16 mill.

*Hab.* Siam (*M. Mouhot*).

16. *BULIMUS PORTII*, Pfr. (n. 1 a). *T. imperforata, ovato-conica, solidula, lævigata; spira convexiusculo-conica, apice obtusula; anfr.  $5-5\frac{1}{2}$ , summi nudi, rubescentes, 2 ultimi præter fascias varias diaphanas olivaceas epidermide hydrophana pallide fuscula saturatius strigata obducti, ultimus spiram subæquans; columella callosa, violaceo-nigricans, superne albo-plicata; apertura obliqua, truncato-auriformis, intus cærulescens; perist. violaceo-nigricans, æqualiter sublata expansum, margine basali cum columella extus angulum prominentem formante.*

Long. 79, diam. 46 mill.

*Hab.* Polillo Islands (*Mr. Porte*).

17. *BULIMUS COMES*, Pfr. (n. 129 b). *T. dextrorsa vel sinistrorsa, subimperforata, ovato-conica, solida, striatula, nitida; spira subregulariter conica, acutiuscula; anfr. 7 vix convexiusculi, 5 primi carnei, supremi ad suturam nigro-marginati, 2 ultimi lutei, livido-virescente varius fasciati, strigati vel nebulosi, ultimus spira paulo brevior, basi rotundatus; columella crassiuscula, subverticalis, alba; apertura parum obliqua, irregulariter semiovalis, basi subangulata, intus alba; perist. patens*

*et reflexiusculum, marginibus callo candido intrante junctis, externo arcuato.*

Long. 47, diam. 24 mill.

*Hab.* Camboja.

18. **BULIMUS MOUHOTI**, Pfr. (n. 218 a). *T. sinistrorsa, subperforata, oblongo-conica, tenuis, subtilissime striatula, parum nitens, lutea, strigis viridibus filaribus confertis picta; spira elongato-conica, vertice acutiusculo, rubello; anfr. 7 vix convexiusculi, superi interdum fusco-tessellati, ultimus  $\frac{3}{4}$  longitudinis subæquans, medio subangulatus, basi attenuatus, subcompressus; columella parum incrassata, torta, pallide lilacea; apertura obliqua, semiovalis, basi subeffusa; perist. tenue, expansum, lilaceo-roseum.*

Long. 34, diam. 14 mill.

*Hab.* Siam (*M. Mouhot*).

19. **BULIMUS FLAVUS**, Pfr. (n. 222 a). *T. sinistrorsa, vix perforata, ovato-conica, tenuis, sublævigata, nitidula, unicolor sulphurea; spira conica, vertice albido, acutiusculo; anfr.  $6\frac{1}{2}$  convexiusculi, ultimus  $\frac{3}{4}$  longitudinis fere æquans, basi tumidus; columella vix inflata, subverticalis; apertura fere diagonalis, obauriformis; perist. tenue, expansum et reflexiusculum.*

Long. 25, diam. 12 mill.

*Hab.* Siam (*M. Mouhot*).

20. **BULIMUS ZEBRINUS**, Pfr. (n. 222 b). *T. sinistrorsa, subperforata, oblongo-conica, solidula, leviter striata, alba, strigis latiusculis subrectis vel undulatis nigro-fuscis dense picta; spira gracilis, conica, vertice acutiusculo nigro; sutura levis, alba; anfr.  $6\frac{1}{2}$ , supremi convexi, reliqui convexiusculi, ultimus  $\frac{2}{5}$  longitudinis subæquans, basi vix attenuatus; columella subinflata, substrictè recedens; apertura obliqua, semiovalis; perist. simplex, latiuscule expansum, margine columellari fornicatim reflexo.*

Long. 25, diam.  $10\frac{1}{2}$  mill.

*Hab.* Siam (*M. Mouhot*).

21. **BULIMUS AREOLATUS**, Pfr. (n. 222 c). *T. sinistrorsa, subperforata, ovato-conica, tenuis, striatula, nitidula, lutescenti-albida, flammis fuscis, sursum plerumque divisis picta; spira conica, vertice minuto, fusco; sutura submarginata; anfr.  $6\frac{1}{2}$  modice convexi, ultimus spira paulo brevior, basi rotundatus, ad columellam area rosea, tum fascia fusca et fascia lutea cinctus; columella subtumida, leviter torta; apertura obliqua, obauriformis; perist. tenue, sublata expansum, margine columellari breviter reflexo.*

Long. 13, diam. 6 mill.

*Hab.* Siam (*M. Mouhot*).

22. **BULIMUS RHOMBOSTOMUS**, Pfr. (n. 222 d). *T. sinistrorsa,*

*anguste umbilicata, ovato-conica, tenuis, subtiliter striata, diaphana, carneo-albida, fascia unica rufula peripherica, ad suturam ascendente ornata; spira conica, vertice obtusulo; anfr. 6 convexiusculi, ultimus  $\frac{1}{3}$  longitudinis subæquans; columella brevis, subverticalis; apertura diagonalis, subrhombea; perist. tenue, marginibus conniventibus, externo superne arcuato, expanso, columellari late patente.*

Long.  $15\frac{1}{2}$ , diam. 11 mill.

*Hab.* Camboja (*M. Mouhot*).

23. *CLAUSILIA CAMBOJENSIS*, Pfr. (§ 12. n. 130 a). *T. vix rimata, cylindraceo-turrita, solidula, capillaceo-striata, sericea, cornea; spira turrita, apice obtusula; sutura profunda; anfr. 11-12 convexi, ultimus basi rotundatus, obsolete gibbosus; apertura semiovalis; lamellæ fortes, supera marginalis, infera stricte ascendens, sursum furcata; lunella imperfecta, interrupta; plica palatalis 1 supera, 2 inferæ breves supra lunellæ rudimenta; plica subcolumellaris juxta lamellam inferiorem emersa; perist. carneum, expansum et reflexiusculum, margine dextro substricto, sinistro arcuato.*

Long. 30, diam. 6 mill.

*Hab.* Camboja (*M. Mouhot*).

24. *HELIX GUINARIA*, Pfr. (n. 1860 a). *T. sublata umbilicata, depressula, tenuiuscula, striata et undique granulata, diaphana, rufo-cornea; spira parum elata, vertice obtuso; anfr. 5, juxta suturam turgiduli, ultimus medio obsolete angulatus, antice constrictus et deflexus; apertura perobliqua, fere circularis; perist. simplex, marginibus approximatis, supero expanso, basali reflexo.*

Diam. maj. 14, min. 12, alt. 7 mill.

*Hab.* Camboja (*M. Mouhot*).

25. *HELIX REPANDA*, Pfr. (n. 1135 a). *T. late umbilicata, subtrochiformis, carinata, solidula, oblique distincte striata, subdiaphana, cornea; spira convexo-conica, vertice minuto; sutura carina subexserta marginata; anfr. 6 convexiusculi, ultimus non descendens, acute striato-carinatus, basi convexior; apertura obliqua, irregulariter rotundato-lunaris, ad dextram angulata; perist. simplex, marginibus subconvergentibus, supero recto, basali repando, reflexo, columellari subverticali, patente.*

Diam. maj.  $12\frac{1}{2}$ , min.  $11\frac{1}{2}$ , alt.  $8\frac{1}{2}$  mill.

*Hab.* Camboja (*M. Mouhot*).

26. *LEPTOPOMA MOUHOTI*, Pfr. (n. 19 a). *T. perforata, globoso-turbinata, tenuis, spiraliter conferte striata et liris 6 acutiusculis, quarum infima peripherica, cariniformi, cincta, pallide fulvida, maculis rufulis picta, vel albida, infra carinam fusco-fasciata; spira elata, acutiuscula; anfr.  $5\frac{1}{2}$  convexi, ultimus spiram subæquans; apertura obliqua, subcircularis; perist. obsolete duplicatum; internum album, adnatum, externum*

*tenuë, patens, acutum, marginibus callo tenui junctis. Operc. tenuissimum, normale.*

Diam. maj,  $9\frac{1}{2}$ , min. 8, alt.  $8\frac{1}{3}$  mill.

*Hab.* Camboja (*M. Mouhot*).

27. PUPINA MOUHOTI, Pfr. (n. 8 a). *T. ovato-subacuminata, tenuis, lævigata, pellucida, fusco-cornea; anfr.  $5\frac{1}{2}$  convexiusculi, ultimus spiram subæquans, antice vix ascendens; sutura levissime marginata; apertura verticalis, subcircularis; paries aperturalis lamella obliqua, marginem dextrum fere tangente munitus; columella oblique dissecta, processum linguiformem subtriangularem exhibens; perist.reflexiusculum, margine dextro sinuato. Operc. tenuë, concolor.*

Long. 9, diam. 5 mill.

*Hab.* Camboja (*M. Mouhot*).

---

May 14th, 1861.

Dr. J. E. Gray, F.R.S., V.P., in the Chair.

The Secretary called the attention of the meeting to several important additions recently made to the Menagerie.

The Hon. James F. Stuart Wortley had presented to the Society, on his recent return from China, thirty-four living specimens of the Three-toed Sand-Grouse of Pallas (*Syrrhaptes paradoxus*), and had given the following answer to a request for particulars concerning his acquaintance with this scarce bird:—

“I fear that I can tell you but little about the Sand-Grouse. The specimens I sent you I bought in the market at Tientsin, where numbers of them were exposed for sale, alive and dead; but whether they were supplied chiefly with a view to the demand caused by the presence of the troops, or whether they naturally form a large article of consumption among the Chinese, I could not say. I rather fancy, however, that the former idea is the correct one. I saw none as far up the country as Pekin; they hardly seemed to range further than Tientsin, but abounded between that place and the mouth of the Peiho. They were always to be seen in large packs, such as you see Grouse in when they get wild in September; and seemed to like being by the side of the river on the mud banks when left dry by the tide.

“On our voyage up to Tientsin in the end of August not a bird was to be seen; and as far as I could learn, they had only just begun to appear at Tientsin when we arrived there, on our return, in the beginning of November. Where they arrived from, or at what time they disappeared again in the spring, I regret to say I never thought of inquiring. Their food must consist of the grain (millet) that covers the whole of that part of China; and I should mention that

I fed them on millet the whole way home. They appeared to like tidal waters, as they seemed to hang about the Peiho banks; but, of course, as our line of march never took us any distance from the river-bank, I could not say that they may not be found more inland. The temperature at the time the birds first began to be seen was about 20° Fahr., and later on considerably lower; and on the day we finally steamed down through the ice, which covered the Peiho for fifty miles of its course, the temperature was as low as 10° Fahr., and the Grouse were in large flocks on each side.

"I lost a good many at first in confinement; and later on, in the hot climate of Java, I lost more, particularly during the wet weather we experienced there. After that I had but few casualties; and I consider myself very fortunate in having been able to hand over as many as thirty-four out of seventy-three which I started with from Tientsin. I regret that my want of scientific knowledge does not enable me to give you a better account of this interesting bird; but I feel sure Mr. Swinhoe will give you any detailed account you may ask him for. I may mention that Major Sarel, one of your Fellows, considered the bird identical with one that he has shot on the lakes in Thibet\*."

A few days subsequent to the arrival of these birds, the Society had received two more pairs of the same species from Capt. Hand of H. M. S. 'Sampson,' with the following note:—

"Capt. Hand begs leave to send the Zoological Society two brace of birds brought from Tientsin, described by Huc as being called there "Dragons' Feet." They were known to us as being called Sand-Grouse. The flesh resembles that of black game; and they feed upon millet and other small seeds—at least have been so fed for the last five months."

The passage referred to by Capt. Hand, in Huc's 'Tartary, Thibet and China,' appeared to be the following (Mrs. Sinnett's translation, London, 1857, p. 93):—

"Tartary is peopled with migratory birds.....Amongst these was one which I believe to be unknown to our naturalists. It is about the size of a quail, of an ash colour, with black spots, its eyes of a brilliant black, and surrounded with a bright sky-blue rim. Its legs have no feathers, but are covered with long rough hair; and its feet are not like those of any other bird, but resemble those of the green lizard, and are covered with a shell so hard as to resist the sharpest knife. This singular creature, which seems to partake at once of the character of the bird, the quadruped, and the reptile, is called by the Chinese *Loung-Kio*, that is, Dragon's Foot. They generally arrive in great flocks from the north, especially when much snow has fallen, flying with astonishing rapidity, so that the movement of their wings is like a shower of hail. When caught they are extremely fierce: the hair on their legs bristles up if you approach them; and if you venture to caress them, you are sure to receive some violent blows from their beak."

\* This was no doubt Mr. Gould's new species of the genus—*Syrrhaptes tibetanus*, figured in Part 2 of his 'Birds of Asia.'—P. L. S.

Another example of the same bird has since been received from Capt. Commerell, R.N., V.C., of H. M. S. 'Magicienne.'

A ship recently arrived from Sydney had brought examples of several very beautiful specimens of Australian *Fringillidæ*, which had been secured for the Menagerie. They belonged to the following species, and were said to have been captured in the vicinity of Port Curtis in the new colony of Queensland.

1. *Estrelida bichenovii*, Gould, Birds of Australia, vol. iii. pl. 80.
2. *Estrelida phaëton*, *ibid.* pl. 83.
3. *Estrelida ruficauda*, *ibid.* pl. 84.
4. *Poëphila cincta*, *ibid.* pl. 93.
5. *Donacola castaneothorax*, *ibid.* pl. 94.

Of these, *Estrelida ruficauda* and *Donacola castaneothorax* had been received in the previous year; but the other three species were new to the Society's collection.

Mr. Leadbeater exhibited examples of both sexes of the *Perdix hodgsoniæ* which had been shot by Major J. C. Hay, of Hopes, Haddington, N. B.,—one near the Buddhist Monastery at Hanlee in Thibet, and the other near the foot of the Lanak Pass on the Hanlee side, 1856. In two former tours in the same district Major Hay had not met with this bird, and on the occasion alluded to had only seen five.

Dr. Gray made some observations on the species of Mammals of which specimens had been obtained by M. Du Chaillu in Western Equatorial Africa.

The Secretary called the attention of the meeting to a stuffed example of a young male Gorilla (*Troglodytes gorilla*) on the table. This animal had been shipped alive for the Society by John Buchanan, Esq., from the Gaboon in June 1859, but had died on the passage, and reached England in a cask of spirits.

The following papers were read:—

- I. DESCRIPTIONS OF TWO NEW SPECIES OF HUMMING-BIRD, BELONGING TO THE GENUS HYPUROPTILA. BY JOHN GOULD, ESQ., F.R.S., ETC.

#### HYPUROPTILA UROCHRYSA.

Head and upper surface dark green, becoming of a bronzy hue on the wing- and tail-coverts; wings purplish brown; tail rich golden-bronze both above and beneath; throat and breast grass-green; thighs, vent, and under tail-coverts pure white; upper mandible black; under mandible fleshy-red, with a black tip; tarsi yellow or flesh-colour.

Total length  $4\frac{3}{4}$  inches; bill  $1\frac{1}{8}$ ; wing  $2\frac{3}{4}$ ; tail  $1\frac{7}{8}$ ; tarsus  $\frac{1}{2}$ .

*Hab.* Panama.

*Remark.*—This species closely resembles the *H. buffoni* in size

and in the colouring of its body; but the rich golden bronzy hue of its tail at once distinguishes it from that and every other species.

#### HYPUROPTILA ISAURÆ.

Head, all the upper surface, wing-coverts, flanks, and abdomen coppery-bronze, inclining to purple on the lower part of the back and upper tail-coverts; wings purplish brown; tail very dark bronze, inclining to purple; throat and breast grass-green; under tail-coverts white; upper mandible black; under mandible fleshy, with a black tip; tarsi yellow or flesh-colour.

Total length  $4\frac{5}{8}$  inches; bill  $1\frac{1}{16}$ ; wing  $2\frac{5}{8}$ ; tail  $1\frac{3}{4}$ ; tarsi  $\frac{1}{4}$ .

*Hab.* Bocca del Toro, in Costa Rica.

*Remark.*—The specimen from which the above description was taken is somewhat immature; it is, however, sufficiently advanced to show that it would have, when adult, a fine green breast; but whether the green colour would extend over the abdomen I am unable to say. It is nearly equal in size to the *H. urochrysa*, *H. buffoni*, and *H. ceruleigastrea*; but it has a shorter wing and a more rounded tail than either of those species, and the under tail-coverts, although white, are less plume-like in form than in the typical *Hypuroptila*. It is just possible that it may be necessary to separate this bird into a new genus when we see it in its fully adult state; but it appears at present to be most nearly allied to the members of the group in which I have provisionally placed it. I received this bird from M. Edouard Verreaux, of Paris, many years ago, since which I do not remember to have seen another.

The specific name *isauræ* was suggested to me by my late highly valued friend the Prince Charles Lucien Bonaparte, who wished thus to convey a compliment to Madame la Baronne de la Fresnaye, the niece of Montbeillard, the able coadjutor of the celebrated Buffon.

## 2. NOTES ON SOME BIRDS COLLECTED BY DR. JERDON IN SIKKIM. BY EDWARD BLYTH, CORR. MEMB.

### TICKELLIA, Jerdon & Blyth, n. g.

Allied to *Culicipeta* and *Abornis*, but with the bill depressed throughout, and not compressed towards the tip; the rictal vibrissæ well developed. Rest as in *Abornis*, Hodgson.

#### TICKELLIA HODGSONI.

*Abornis? hodgsoni*, Moore, Horsfield's Catal. i. p. 412.

#### ABRORNIS ALBIVENTRIS, Jerd. & Blyth, n. s.

Allied to *A. castaneiventris*, Hodgson, but distinguished by having the abdominal region white; no white on the tail-feathers, nor yellow band on wing, but the lower tail-coverts yellow; the ear-coverts, in addition to the crown, pale chestnut; throat white, and

breast moderately bright yellow; rest of upper parts yellowish-green, more yellowish on the borders of the tail-feathers; bill shorter and broader than in *A. castaneiceps*, which latter species is rather a *Reguloides*.

Length about  $3\frac{3}{4}$  in., of wing  $1\frac{1}{6}\frac{3}{8}$  in., and tail  $1\frac{1}{2}$  in.; bill to gape  $\frac{3}{8}$  in., and tarsi  $\frac{1}{2}$  in.; short first primary  $\frac{5}{8}$  in., the next  $\frac{7}{16}$  in. long, and the third  $\frac{1}{8}$  in. shorter than the fourth.

*Hab.* Sikkim.

*ABRORNIS ALBIGULARIS* Jerd. & Blyth, n. s.

Yellowish green above, with a rufescent tinge on the tail-feathers; head greyish; throat and fore neck white, and rest of lower parts bright yellow; legs pale; no trace of band on wing.

Length about 4 in. or nearly, top of wing  $1\frac{7}{8}$  in., and tail  $1\frac{1}{2}$  in.; bill to gape  $\frac{7}{16}$  in., and tarsi  $\frac{3}{4}$  in.; first short primary  $\frac{3}{4}$  in., the next  $\frac{3}{8}$  in. longer, and the third less than  $\frac{1}{8}$  in. shorter than the fourth.

*Hab.* Sikkim.

*ABRORNIS MELANOPS*, Jerd. & Blyth, n. s.

Yellowish olive-green above, yellow on the rump and on the throat and breast, white on the belly and inside of wing; the outer webs of all but the medial pair of tail-feathers white; a very broad bright-yellow supercilium; the ear-coverts grey, and lores and ocular region black; bill rather short; feet apparently plumbeous.

Length about 4 in., of wing  $1\frac{3}{4}$  in., and tail  $1\frac{1}{2}$  in.; bill to gape  $\frac{7}{16}$  in., and tarsi  $\frac{5}{8}$  in.; first short primary  $1\frac{1}{16}$  in., the next  $\frac{3}{8}$  in. longer, and the third  $\frac{1}{8}$  in. shorter than the fourth.

*Hab.* Sikkim.

*REGULOIDES VIRIDIPENNIS*, Blyth, J. A. S. B. xxiv. p. 275.

This species, hitherto known only from Borneo, was obtained by Dr. Jerdon at Darjeeling. *Abrornis superciliaris*, Tickell (Blyth, J. A. S. xxviii. p. 414) as yet is known only from Burmah.

*ORTHOTOMUS CORONATUS*, Jerd. & Blyth, n. s.

Green above, with a golden-fulvous crown and ashy nape; throat and breast white: the rest of the lower parts and also the fore part of the wings underneath bright yellow; a slight whitish supercilium; the lores and ear-coverts ashy; inner webs of the outermost and penultimate tail-feathers white; rest of tail dusky; bill duskyish, and legs pale fleshy yellow; tail less graduated than usual in this genus.

Length  $4\frac{1}{2}$  in.; expanse  $5\frac{3}{4}$  in.; of wing  $1\frac{7}{8}$  in., and of tail  $1\frac{1}{2}$  in.; bill to gape  $\frac{3}{4}$  in.; tarsi  $\frac{3}{4}$  in.

*Hab.* Sikkim.

Allied to *O. cucullatus*, Temminck, of Sumatra. Common in Sikkim.

## BRACHYPTERYX, Horsfield.

Four species of this genus were obtained at Darjeeling by Dr. Jerdon.

## (1.) BRACHYPTERYX CRURALIS, Blyth.

Allied to *B. montana*, Horsfield, but smaller.

## (2.) BRACHYPTERYX NIPALENSIS, Hodgson.

*Brachypteryx nipalensis*, Moore, Horsfield's Cat. i. p. 367.

## (3.) BRACHYPTERYX HYPERYTHRA, Jerd. &amp; Blyth, n. s.

Female? Dusky olive-brown above, ferruginous below, save the middle of the belly, which is white; lores tinged with ferruginous; bill corneous, and legs pale.

Length about 5 in., of wing  $2\frac{1}{2}$  in., and of tail  $1\frac{3}{4}$  in.; bill to gape  $\frac{5}{8}$  in., and tarsi  $1\frac{1}{8}$  in.

## (4.) BRACHYPTERYX RUFIFRONS, Jerd. &amp; Blyth, n. s.

Female? Dull greenish olive-brown above, paler brown with a rufescent tinge on the throat and front; middle of the belly albescent; forehead brightish ferruginous; bill dusky, and legs dusky red.

Length  $5\frac{1}{2}$  in., of wing  $2\frac{5}{8}$  in., and tail  $1\frac{3}{4}$  in.; bill to gape  $\frac{5}{8}$  in., and tarsi  $1\frac{1}{8}$  in.

## SIPHIA ERITHACUS, Jerd. &amp; Blyth, n. s.

Form typical. Colour dusky-slate above and on the side of the throat and neck; middle of throat, breast and flanks bright ferruginous; vent, lower tail-coverts, and base of all but the middle pair of tail-feathers white; rest of tail and wings dusky; the great alars slightly bordered with brown; bill blackish, and feet brown.

Length about 5 in., of wing  $2\frac{3}{4}$  in., and tail 2 in.; bill to gape  $\frac{1}{2}$  in.

*Hab.* Sikkim; Himalaya.

## Genus NITIDULA, Jerd. &amp; Blyth.

Resembles *Muscicapula*, Blyth, but has a slender undepressed bill, like that of *Phylloscopus*.

## NITIDULA CAMPBELLI, Jerd. &amp; Blyth.

Colour bright dark-indigo-blue above, passing to ultramarine on the crown; slight frontal band, lores, ear-coverts, and sides of neck black; wings and tail the same, a little margined with the hue of the back; throat, breast, and belly clear bright ferruginous; the axillaries, tibial plumes, vent, and lower tail-coverts white; bill blackish, and legs pale plumbeous.

Length about 4 in., of wing  $1\frac{7}{8}$  in., and tail  $1\frac{1}{4}$  in.; bill to gape  $\frac{1}{2}$  in., and tarsi  $\frac{5}{8}$  in.

*Hab.* Sikkim; Himalaya.

MINLA CINEREA, Blyth, J. A. S. B. xvi. p. 449.—*Leiothrix cinerea*, Moore, P. Z. S. 1854, p. 142.

In new plumage, this species has a greenish wash on the back, and the lores, supercilia, and under parts are strongly tinged with yellow.

IXULUS STRIATUS, Blyth, J. A. S. xxviii. p. 413.

This species was described from the mountains of Burmah. A second specimen from Sikkim has a strong rufous-chestnut tinge on the supercilia and ear-coverts, but not on the crown, or it might be considered absolutely identical with *I. castaneiceps* (Moore, P. Z. S. 1854, p. 141). The latter, it may be remarked, is, *of course*, not from Afghanistan, as stated by Mr. Moore, but doubtless from the Khásh'ya hills. (*Vide* note to J. A. S. B. xxviii. p. 413.)

### 3. DESCRIPTIONS OF THREE NEW SPECIES OF BIRDS FROM GUATEMALA. BY OSBERT SALVIN, M.A., F.Z.S.

The three birds I propose to describe in this paper form part of a collection lately brought to this country by Mr. Robert Owen, Corresponding Member of this Society, from Vera Paz, Guatemala. The greater part of this collection was formed by one of the collectors I employed during a visit to Coban in the early part of last year: the low-lying lands of Central Vera Paz in the neighbourhood of a village called Chisec, situated on one of the confluent of the Rio de la Passion, is the locality from which they were derived. The rest of the collection was formed by Mr. Owen himself at Coban, or in the adjacent mountains. Amongst the known forms are many of considerable rarity, besides several additions to our knowledge of the Avi-fauna of the country from which they come.

#### 1. CYPHORHINUS PHILOMELA.

*Supra brunneus, plumis anguste nigro marginatis, pileo et uropygio obscurioribus: subtus fuliginosus, plumis medialiter nigris, et nigro terminatis, gula pallidiore, lateribus brunneis nigro transfasciatis: alis caudaque nigris, plumis tectricum remigum macula parva subapicali ochraceo-alba: rostro nigro, pedibus fuscis.*

Long. tot. 4, alæ 2·3, caudæ 1 poll. angl. et dec.

*Hab.* In Prov. Veræ Pacis sylvium montium.

*Obs.* Affinis *Cyphorhino bamblæ* ex Cayenna, sed tectricibus alarum maculatis et non albo vittatis facile notabilis.

This Wren belongs to the division of this genus which Dr. Sclater has classed under the name of *Microcerculus*. It is known to the natives as the 'Ruisseñor,' or Nightingale—a name it has acquired from its great vocal powers.

#### 2. EMBERNAGRA CHLORONOTA.

*Supra olivacea, pileo cinereo: subtus cinerea, gula et ventre medio albis, crisso flavidiore, lateribus olivaceis: vitta utrinque*

*pilei vittaque angusta per oculos transeunte nigra: alis fuscis, extus dorso concoloribus: tectricibus subalaribus et camptero late flavis: rostro superiore nigro, inferiore corneo, pedibus carneis.*

Long. tot. 5·75, alæ 2·6, caudæ 2·5.

*Hab.* In Prov. Veræ Pacis regione calida.

*Obs.* Affinis *Embernagræ conirostri* ex Nova Granada, sed statura minore, dorso olivaceo pectoreque cinereo dignoscenda.

Several specimens of this *Embernagra* are in the collection, all closely agreeing in the above characters.

### 3. APHANTOCHORA ROBERTI.

*Aureo-viridescens, supra unicolor: subtus gula cum mento lateribusque obscurioribus, ventre medio vix viridi lavato, plumis late pallido ochraceo terminatis, ventre imo albo: crisso viridescenti-fusco, plumis albo clare marginatis: alis purpurascenti-nigris, tectricibus subalaribus viridescens: cauda aureo-viridescens; rectricum duarum externarum media parte nigra, parte apicali alba: rectricibus reliquis nigro terminatis: rostro omnino nigro, pedibus nigerrimis.*

Long. tot. 4·75, alæ 2·75, caudæ 1·9, rostri a rictu 1.

*Hab.* In Prov. Veræ Pacis regione calida.

*Obs.* Affinis *Campyloptero cuvieri* Gouldi, ex Costa Rica, sed rostro omnino nigro, et caudæ fascia nigra latiore distinguenda.

A single specimen, marked male, is in the collection; I have dedicated it to Mr. Robert Owen.

### 4. REMARKS ON PALLAS'S SAND-GROUSE (*SYRRHAPTES PARADOXUS*). BY ALFRED NEWTON, M.A., F.Z.S.

Our Secretary having entrusted to my charge an example of *Syrrhaptēs paradoxus* which died at the Gardens a few days ago, I am desirous of recording the results of my examination of it.

I must apologize to the meeting for the imperfection of the observations I am about to offer. I have not been able to compare the skeleton of this bird with that of other Sand-Grouse, except from memory; and I prefer to confine my remarks to the structure of the sternal apparatus. This, as is the case in other species of the peculiar group to which *Syrrhaptēs* belongs, offers at first sight an unquestionable resemblance to that of many of the *Columbidæ*, particularly of those members of the family which possess terrestrial habits. The similarity seems principally to arise from the form of the lateral processes of the sternum, which in *Syrrhaptēs* are widened and partially united to the main portion as in *Chamæpelis* and *Geopelia*, instead of being singularly prolonged and acuminate as in the more typical *Gallinæ*. The resemblance is also increased by the exceedingly deep keel, which is of similar conformation to that of the *Columbidæ* generally. But here the likeness ends. The

coracoid bones, which I am inclined to regard as the most characteristic in, as they are the most peculiar to, the ornithic skeleton, are plainly framed on the true Gallinaceous model. The furculum is very different from that of any other group of birds which I happen to remember, and bears no resemblance to the same bone in the *Phasianidæ* or *Tetraonidæ*. Still less, however, does it indicate any approximation to the same part in the *Grallæ*, or I may say of the *Columbidæ*, with both of which groups the Sand-Grouse have been supposed to have affinity. From the peculiarities, therefore, of the sternal apparatus I am fully of opinion that Bonaparte, and those authors who have followed him, are quite right in elevating the Sand-Grouse to the dignity of a family (*Pteroclidæ*), though I imagine they were chiefly led to that conclusion by an examination of the external characters only.

I should have felt it incumbent upon me to have made some remarks on the information possessed by naturalists respecting this rare and curious bird; but almost all that can be said on the subject has recently been admirably recapitulated in a paper by my friend Mr. T. J. Moore in 'The Ibis' for last year\*. I would, however, observe that though the illustrious Pallas has the credit of first giving a *description* of this bird, he does not appear to have seen more than a single example of it, which was obtained in the Kirghis steppes by Nicolas Rytschkof, and mentioned by him in his Journal †. And of this example, judging from the figure given of it, not only, as Pallas himself says "*Cauda in specimine deerat*," but it also appears to have lost the elongated portion of the shafts of the outer remiges, which form so singular a feature in the species, and which, as we see by the state of the birds in our Gardens, are no doubt easily broken off. I must be allowed to add that I think this circumstance greatly favours the supposition that the specimens which were obtained in Western Europe in July and August 1859, were not indebted to any human interference for their transport; for I have had the good fortune to examine all four of them, and each possessed these extraordinary appendages in nearly perfect preservation.

5. ON A NEW SPECIES OF WATER-TORTOISE (*GEOCLEMMYS MELANOSTERNA*) FROM DARIEN. BY DR. J. E. GRAY, F.R.S., V.P.Z.S., ETC.

The British Museum has just received a very distinct species of the more terrestrial kind of Terrapins, or Freshwater Tortoises, from Cherunha in the Gulf of Darien.

It is easily known from the other described species by the black colour of the upper and lower surface, and pale-yellowish sides, and

\* The Ibis, 1860, p. 105.

† 'Kirgis-kaisazkoi Stepie, &c. St. Petersburg, 1772, p. 40.' I have not been able to see this work, and only quote the reference at second hand.—A. N.

the distinct bright-yellow superciliary streak on each side of the head, extending from the nostril to the occiput.

**GEOCLEMMYS MELANOSTERNA.**

Shell black, one-keeled; the first vertebral plate longer than broad, truncated behind; second and third six-sided, about as broad as long, the fourth broader than long; the keel low, rather interrupted; the areola of the dorsal and marginal shield posterior; the margin rather acute, slightly bent up in front and on the sides; the nuchal shield more distinct; the sternum flat, black, with rather paler edges to the shields; the sterno-costal slope rather convex, pale yellowish; the under surface of the marginal plates pale; the axillary plate moderate, the inguinal plate small, both pale-coloured. The head moderate, rather acute in front, black, with a distinct bright-yellow streak diverging over the eyes and extending from the nostril to the back of the head. The legs and tail brown with black spots, forming more or less distinct streaks; toes 5·4, short, strong, subequal, covered with distinct band-like scales; the claws strong, conical, black.

*Hab.* The Gulf of Darien: Cherunha.

**6. DESCRIPTIONS OF NEW SHELLS FROM THE COLLECTION OF H. CUMING, ESQ. BY DR. H. DOHRN.**

(Plate XXVI.)

**1. EPIDROMUS CUMINGI.** (Pl. XXVI. fig. 5.)

*T. ovato-turrita, costis spiralibus et longitudinalibus fenestrata, alba, passim flavo-maculata; varicibus arcuatis, longitudinaliter striatis, transverse costatis; sutura valde impressa; anfr. 8-9, valde convexi, lente accrescentes, ultimus antice ascendens; apertura ovata; margine columellari callo lato granulato tecto, labro dentato.*

Long. 31, lat. 12; ap. long. 12 mill.

*Hab.* In Insulis Philippinis.

Differt ab *E. clathrato*, Sow., costis eorumque nodis validioribus, varicibus arcuatis, anfractibus convexioribus.

**2. MITRA AURORA.** (Pl. XXVI. fig. 3.)

*T. ovato-fusiformis, nitida, spiraliter punctato-striata, aurantiaca, ad suturam fascia alba irregulari cincta, maculis et punctis albis adpersa; sutura crenata, marginata; spira acuminata; anfr. 8, plani, ultimus basi attenuatus et sulcatus; apertura fere verticalis, intus cærulescenti-albida; labrum crenatum; columella callo 5-plicato tecta.*

Long. 35, lat. 13; ap. long. 18, lat. 6½ mill.

*Hab.* In insulis Sandwich.

Accedit ad varietates quasdam *M. coronatæ*, Lam.

**3. MITRA ADAMSI.**

*T. solida, ovata, longitudinaliter costellata, costis albidis, interstitiis*

*fuscis, spiraliter strigillatis; anfr. 7, planiusculi, ultimus ventrosior, medio fascia alba cinctus, basi spiraliter sulcatus; apertura intus livida, columella 4-plicata.*

Long. 16, lat. 8; ap. long.  $8\frac{1}{2}$ , lat. 3 mill.

*Hab.* In Insulis Sandwich.?

Affinis *M. dermestina*, Lam., sed differt costis planioribus, striis spissis intercostalibus.

4. MITRA ARABICA. (Pl. XXVI. fig. 4.)

*T. fusiformis, nitida, laeviuscula, fulva, sub epidermide decidua cornea, supra medium fascia lata alba, basi lineis fuscis albipunctatis cincta; spira acuminata; anfr. 6-7, planiusculi, ultimus basi attenuatus, medio cylindraceus; apertura intus cærulea; labrum crenatum, columella oblique 4-plicata.*

Long. 21, lat. 8; ap. long. 12, lat. 3 mill.

*Hab.* In Mari Rubro.

Color *M. maculosæ*, Reeve, a qua spira elevata, acuta valde discrepat.

5. MITRA GAMBIANA.

*T. fusiformis, spiraliter sulcata, ad suturam carinata, sub epidermide olivaceo-cornea albicans vel flavescens; spira elongata, acuta; anfr. 7-8 angulati, ultimus basi attenuatus; apertura intus alba, labrum simplex; columella 4-plicata.*

Long. 20, lat. 6; ap. long.  $10\frac{1}{2}$ , lat.  $2\frac{1}{2}$  mill.

*Hab.* In Senegambia.

Differt a *M. carinata*, Swains., sculptura; ceterum proxime ei affinis.

6. NERITINA PRITCHARDI. (Pl. XXVI. fig. 2.)

*T. semiglobosa, sordide fusco-olivacea, striis et squamis triangularibus rugosa, supra medium angulata, angulo irregulariter spinis brevibus recurvis armato; spira exserta; apertura et area columellaris flavæ; labium album, parte media arcuata, obsolete multidentata, ceterum rectum, edentulum. Operculum semiovale, crasum, calcareum, flavo-rubens, margine corneo purpureo, latere externo concaviusculo obsolete striato, interno linea mediana angulato, dentibus duobus validis marginalibus armato, quorum superior arcuatus, lamelliformis, inferior brevis, aduncus.*

*Hab.* In Insulis Fidji (Dr. Seemann).

Accedit ad *N. squamosam*, Récl., differt labio, operculo.

7. NERITINA WALLACII. (Pl. XXVI. fig. 1.)

*T. ovato-globosa, striis incrementi vix rugulosa, læte olivacea, lineis et fasciis nigris eleganter cingulata; spira exserta; apertura semicircularis, alba; area columellaris crasse albicallosa; labium parte basali edentulum, ceterum crenatum, supra medium fortius unidentatum. Operculum?*

*Hab.* In Insulis Aru (Wallace).

Forma et colore hæc species pulchra accedit ad varietates quasdam *N. dubiæ*, Chemn., a qua differt testa non lævi, labio crenato.

8. *BULIMUS GLAUCOLARYNX*. (Pl. XXVI. fig. 7.)

*T. rimata, ovato-turrita, tenuiuscula, lævigata, sub epidermide cornea lutea, cærulescenti-vel purpureo-fusco late strigata et fasciata; spira conica, obtusiuscula, purpurea, raro livida; sutura submarginata, late albocincta; anfr. 6-7 convexiusculi, ultimus  $\frac{3}{5}$  longitudinis æquans, basi subangulatus et fascia lata straminea cinctus; apertura obliqua, semiovalis, basi effusa, intus violacea; peristomium expansum, violaceum, marginibus callo tenui junctis.*

Extant in Museo Cumingiano varietates major et minor, dextrorsa et sinistrorsa; item varias anfractu ultimo medio albizonato.

*α*. Long. 45, lat. 17; ap. intus long.  $17\frac{1}{2}$ , lat.  $9\frac{1}{2}$  mill.

*β*. Long. 31, lat. 14; ap. intus long. 13, lat. 8 mill.

*Hab.* In regno Siam.

Accedit forma ad *B. contrarium*, Müll. et *B. adamsi*, Reeve.

9. *BULIMUS SEEMANNI*. (Pl. XXVI. fig. 6.)

*T. subobtecte perforata, oblongo-fusifformis, solidiuscula, longitudinaliter ruguloso-striata, carneo-rufescens vel flavescens; sutura marginata; spira elongato-conica; anfr. 5 vix convexi, ultimus  $\frac{3}{5}$  longitudinis superans, medio compressus, antice valde descendens; columella torta et valide plicata; apertura parum obliqua, auriformis, basi effusa; peristomium album late et crasse labiatum, ad columellam reflexum, marginibus callo crasso junctis.*

Long. 70, lat. 21; ap. c. perist. long. 40, lat. 18 mill.

*Hab.* In Insulis Fidji (*Dr. Seemann*).

Species pulcherrima proxime accedit ad *B. cleryi*, Petit; differt sculptura, numero anfractuum, labro albo, calloso, expanso. Speciminibus allatis epidermis deesse videtur decidua, sicut illi; exstant item juniora, quorum labrum imperfectum, callus minus crassus.

7. NOTE ON THE OCCURRENCE OF FILARIA SANGUINEA IN THE BODY OF THE GALAXIAS SCRIBA, A FRESHWATER FISH FROM AUSTRALIA. BY W. BAIRD, M.D., F.L.S.

In the beginning of this year, some time in February, several freshwater fishes belonging to the genus *Galaxias* were brought over to this country, alive, from the Murray River, Australia. Though several survived the passage across the Atlantic, only one reached the hands of the importer, Mr. Lloyd, alive.

This little fish was then placed in the freshwater Vivarium in the Zoological Gardens, Regent's Park, but it only lived about a week there, dying in the beginning of March. Upon an inspection of the body after death, an intestinal Worm was discovered making its appearance through the skin near the left pectoral fin. A more minute examination discovered the existence of an abscess in that part of

the body, upon opening which I took out five specimens of a small Worm which occupied the cavity of the abscess, and were apparently making their way through the integuments of the fish. The abscess communicated with the peritoneal cavity of the *Galaxias*, and had evidently caused its death. Upon examining the Worms, they appear to be identical with the species first described by Rudolphi as being found by him lodged under the integuments of the caudal fin of the *Cyprinus gibelio*, or Crucian Carp, and named by him *Filaria sanguinea*. This species has since been found by Creplin in the cavity of the abdomen of the *Leuciscus rutilus*, or common Roach, and by Siebold in the *L. erythrophthalmus*, the Red-eye or Rudd. The specimens taken from the *Galaxias* are from  $1\frac{1}{4}$  to 3 inches in length, and, as Rudolphi has described them, they are thickish in form, obtuse at both extremities; and the larger ones were of a blood-red colour, which, however, has disappeared since they were placed in spirits. It was interesting to discover whether this was a new species or not, and whether it had existed in the body of the fish before it left Australia. A comparison with the specimen of *Filaria sanguinea* in the collection of Entozoa in the British Museum, transmitted to us by Mr. Siebold, leaves no doubt on my mind of its identity with that species; and therefore in all probability these Worms have been developed in the cavity of the abdomen of this little *Galaxias* since it was placed in the tank at the Zoological Gardens, or during its passage from Australia to this country.

---

May 28th, 1861.

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

The Secretary called the attention of the meeting to a fine collection of animals presented to the Society by H.E. Sir George Grey, K.C.B., Governor of the Cape Colony, which had arrived in the Gardens on the previous Saturday, May 25th, under the care of the Society's agent Mr. James Benstead. The losses during the voyage had been very few, and the state of the animals on their arrival reflected great credit on the care and skill of Mr. Benstead.

The species received were the following:—

#### MAMMALS.

1. A female Koodoo Antelope (*Strepsiceros kudu*). This animal, which was believed to be the first example of this beautiful Antelope received alive in Europe, unfortunately died suddenly in the Gardens a short time after its arrival.

2. A female Bless-bok Antelope (*Damalis albifrons*). A single example of this Antelope had been previously received by Lord Derby, and was sold at the sale of the Knowsley Menagerie.

3. A female Reh-bok (*Heleotragus capreolus*). Of this Antelope the Society already possessed a female example.

4. A female Stein-bok (*Calotragus tragulus*); received in Europe for the first time.

5. A female Grys-bok (*Calotragus melanotis*); previously received living by Lord Derby, but new to the Society's collection.

6. A male Blau-bok (*Cephalophus pygmaeus*). Sir George Grey had on a former occasion sent to the Society specimens of this Antelope.

7. A female Zebra (*Equus burchelli*); differing from the ordinary specimens of this animal in having the stripes further extended down the legs, and rather different markings on the back.

8. A Maugé's Dasyure (*Dasyurus maugæi*); imported from Australia (purchased at the Cape).

9. A Pig-tailed Monkey (*Macacus nemestrinus*); purchased at the Cape; probably from Java.

10. Six examples of the Cape Hyrax (*Hyrax capensis*), or "Rock-rabbit" of the Colonists.

#### BIRDS.

11. A young pair of the Stanley Crane (*Tetrapteryx paradisea*).

12. A very fine example of the Wattled Crane (*Grus carunculata*); not previously exhibited in the Society's collection for several years.

13. A specimen of a new species of Waterhen from the Island of Tristan d'Acunha (*Gallinula nesiotis*, sp. nov.), with the wings imperfectly developed, and said to be unable to fly.

#### REPTILES.

Eight Snakes and two Chameleons belonging to the following species:—

*Coronella cana.*

*Leptodeira rufescens.*

*Psammophis sibilans.*

*Boodon lineatus.*

*Lamprophis aurora.*

*Bucephalus capensis.*

*Naija haje.*

*Chamaeleo dilepis.*

Mr. Gould made some observations on some examples of *Epthia-nura tricolor*, collected by Mr. G. F. Angas (Corr. Memb.) at the head of Spencer's Gulf, in Australia, and presented by that gentleman to the British Museum.

The following papers were read:—

1. ON A NEW SPECIES OF BIRD OF THE GENUS LIPAUGUS OF BOIÉ. BY P. L. SCLATER, M.A., PH.D., F.R.S., SECRETARY TO THE SOCIETY.

Mr. G. R. Gray having kindly called my attention to a skin in the PROC. ZOOL. SOC.—1861, No. XIV.

collection of the British Museum, which seems to belong to a very distinct new species of the genus *Lipaugus*\* of Boié, I take the opportunity of giving a list of the members of this peculiar American genus now known to me, together with the characters of the new bird, which I propose to call

#### LIPAUGUS SUBALARIS.

*Viridescenti-olivaceus, dorso imo, ventre et cauda cinerascens, cauda fere tota cinerea; crisso albicante; pilei semicristati plumis interne nigris; gutturis et pectoris plumarum scapis conspicue flavicanti-albis; plumis axillaribus et subalaribus læte citrino-flavis; alis fusco-nigris, extus dorso concoloribus; rostro et pedibus nigris.*

*Hab.* In rep. Equatoriana, ad ripas fl. Napo.

This *Lipaugus* will be easily recognized by the beautiful bright yellow colour of the axillaries and under wing-coverts and the slightly crested head, the feathers of which are black underneath. In structure it appears to be a member of the group *Aulia*: the outer and middle toes being completely united to the end of the second phalange, and the form otherwise resembling that of *Lipaugus hypopyrrhus*. The single example in the collection of the British Museum, acquired in 1857, is labelled "Rio Napo."

I have examined specimens of nine species of this genus, which may be arranged as follows in three sections.

#### a. LATHRIA.

*Majores: rostro dilato; pedibus fortioribus; digitis duabus externis ad basin conjunctis.*

##### 1. LIPAUGUS FUSCOCINEREUS.

*Querula fuscocinerea*, Lafr. Rev. Zool. 1843, p. 291.—*L. fuscocinereus*, Hartl. Rev. Zool. 1846, p. 3; Bp. Consp. p. 179.—*Lathria fuscocinerea*, Cab. Mus. Hein. ii. p. 101.

*Hab.* In Nova Granada.

*Mus.* P. L. S.

##### 2. LIPAUGUS CINERACEUS.

*Le Cotinga cendré*, Levaill. Ois. Amér. et Ind. p. 98, pl. 44.—*Ampelis cineracea*, Vieill. Nouv. Dict. viii. p. 162, et Enc. Méth. p. 761.—*Lathria cinerea*, Sw. Flycatchers, p. 78, pl. 2.—*Lipaugus cineraceus*, Cab. Orn. Not. i. p. 240, et in Schomb. Guian. iii. p. 693.—*Lathria cineracea*, Cab. et Hein. Mus. Hein. ii. p. 101.

*Hab.* In Cayenna, Guian., et Valle Amazonum.

*Mus.* P. L. S.

##### 3. LIPAUGUS PLUMBEUS.

*Muscicapa plumbea*, Licht. Doubl. p. 53; Max. Beitr. iii. p. 806.

\* Sometimes erroneously written *Lipangus*, the derivation being *λείπειν* *deficere*, and *ἀύγη* *splendor*.

—*M. vociferans*, Max. Reise, i. p. 242, et ii. p. 118.—*L. cineraceus*, Cab. et Hein. l. c. (partim).

*Hab.* In Brasilia\*.

*Mus.* P. L. S.

#### 4. LIPAUGUS UNIRUFUS.

Sclater, P. Z. S. 1859, p. 385; Sclat. et Salv. Ibis, 1860, p. 36.

*Hab.* In Mex. merid. et Guatemala.

*Mus.* P. L. S.

#### b. LIPAUGUS.

*Minores: pedibus debilibus: digitis duabus externis ad basin minus conjunctis.*

#### 5. LIPAUGUS SIMPLEX.

*Muscicapa simplex*, Licht. Doubl. p. 53.—*Lipaugus simplex*, Hartl. Rev. Zool. 1846, p. 3; Bp. Consp. p. 179.

*Hab.* In Brasilia.

*Mus.* P. L. S.

#### 6. LIPAUGUS HOLERYTHRUS.

Sclat. et Salv. P. Z. S. 1860, p. 300, et Ibis, 1860, p. 400.

*Hab.* In Guatemala.

*Mus.* P. L. S.

#### c. AULIA.

*Minores: rostro compressiore: digitis duabus externis per duas phalanges conjunctis.*

#### 7. LIPAUGUS HYPOPYRRHUS.

*Ampelis hypopyrrha*, Vieill. Nouv. Dict. viii. p. 164, et Enc. Méth. p. 762.—*Musc. sibilatrix*, Max. Beitr. iii. p. 810.—*Lipaugus hypopyrrhus*, Hartl. Rev. Zool. 1846, p. 3; Bp. Consp. p. 179; Gray & Mitch. Gen. B. pl. 60.—*Aulia hypopyrrha*, Cab. et Hein. Mus. Hein. ii. p. 101.

*Hab.* In Brasil., fl. Amazon. sup. et Nov. Granada.

*Mus.* P. L. S.

#### 8. LIPAUGUS SUBALARIS.

*Hab.* In rep. Equat. cisandeanana.

*Mus.* Brit.

#### 9. LIPAUGUS RUFESCENS.

*Lipaugus rufescens*, Sclater, P. Z. S. 1857, p. 296, et Ibis, 1859, p. 124.—*Lathriosoma typicum*, Bp.

*Hab.* In Guatemala.

*Mus.* Brit.

\* The Brazilian bird is readily distinguishable from the northern form by its larger size, longer wings, and the brownish colour of the back and wings, and particularly of the tail.

Mr. Cassin's *Lipaugus unirufus*, from the Isthmus of Darien (Proc. Acad. Philad. 1860, p. 143), is perhaps distinct from the Guatemalan and Mexican bird.

2. ON THE HABITS OF THE GORILLA AND OTHER TAILLESS LONG-ARMED APES. BY DR. J. E. GRAY, F.R.S., V.P.Z.S., ETC.

Recently the habits of the Gorilla have excited considerable interest; and it has been described by some authors as a fierce and untameable animal, which, by its strength, has driven all other wild animals from its haunts.

It is to be observed that the Ourang Outan was formerly charged with all manner of iniquities, such as carrying off women and children, defending itself with clubs, clawing people up by its hind feet as they passed through the woods; but as the habits of the animal became known, these tales, found untrue, were transferred to the Gorilla or the adult Chimpanzee\*, and I believe with as little truth.

Dr. Abel's account of the Ourang of Java, copied into Griffith's 'Animal Kingdom,' vol. i. p. 239, and more recently Mr. Wallace's paper on the Habits of the Orang Utan of Borneo, published in the 'Annals and Magazine of Natural History' for 1856 (vol. xviii.), p. 26, have entirely dispelled all these delusions as regards the Ourang; though it is said that "there is no animal in the jungle so strong as he," p. 29. It is thus shown that strength is no proof of ferocity, and all the stories of the Gorilla seem based on the fact that being strong it must be very ferocious. Never was a greater fallacy.

The Chimpanzee (according to M. Du Chaillu) "is a great tree-climber, passing much of its time among the branches of the great trees of Tropical Africa. It is thoroughly untameable (?) when grown, still not fierce and malign like the *Gorilla* (?). It has never been known to attack man, and its young are tractable and easily tamed. Like its great congener, it is not gregarious."

Raffles' description of the habits of the *Siamang*, copied into Griffith's 'Animal Kingdom,' vol. i. p. 255, shows it to be a mild and inoffensive animal, capable of being "easily tamed or, rather, reconciled to bondage," but "unconquerably timid."

Duvaucel describes the Wou-Wou (*Hylobates agilis*) as living in pairs. It springs from tree to tree with wonderful agility, and can therefore be seldom taken alive; and this is the character given by all authors I have met with who have observed the various species or varieties of Gibbons alive in their native haunts.

From these accounts, and from all that I can learn of the habits of these animals from authentic sources, where there is no attempt

\* This animal exhibits an instance of how names are changed. Battle called it after the native name *Engeco*, Buffon *Engoko*, and shortened it to *Jocko*; hence *Jacko*, or *Jackey*—a name often applied to monkeys of all kinds.

to enhance the danger of their chase, I am induced to believe that all the tailless long-armed Apes, not excepting the Gorilla, are tree-living, fruit-eating animals, living where beasts of prey are not to be found, or out of their reach, if they are found together in the same locality ; so that there is no reason for them to be fierce or vicious, especially as the succulent nature of their food does not render it necessary that they should come to the earth—on which they always walk with difficulty—to obtain fluid.

At the same time I have no doubt they sometimes fight among themselves for their mates, and would defend themselves, or perhaps attack any animal—the larger kinds even man—if brought to bay, and that they would use all their force and cunning to escape from confinement, and thus try to recover their liberty ; but every animal, even the most docile and herbivorous, as the deer, antelope, &c., will do this, and might therefore as well be called vicious and untameable.

They are most, if not all, of them provided with very loud voices ; and the *Siamang* is provided with large guttural sacs, which have been supposed to facilitate the production of these sounds ; but as M. Duvaucel did not find them in the '*Wou-Wou*,' which also emits a fearfully loud voice, he infers that the bags do not affect the sound. Some of the American Monkeys are called Howlers on account of the sounds they emit, which in these animals are said to be produced by a peculiarity in the form of the larynx.

The *Ourang* and *Siamang* are seldom found far from the sea, and I have been informed by the Gaboon traders that all the *Gorillas* they have seen have been taken near the coast.

A friend has informed me that these observations as to the habits of the Gorilla are confirmed by his examination of the skins and skeletons now being exhibited in Whitehall Place ; he says they seem to have been wounded when retreating, and not attacking. It is true that they are represented in M. Du Chaillu's book as advancing, and are said to always fall on their faces, but in the plates they are represented as lying on their backs.

### 3. LIST OF THE COLD-BLOODED VERTEBRATA COLLECTED BY B. H. HODGSON, ESQ., IN NEPAL. BY DR. ALBERT GÜNTHER.

At the request of Mr. Hodgson I have examined the whole of the collections of specimens and drawings of Reptiles and Fishes which he has at various times presented to the British Museum. The new species of Reptiles contained therein have been already described by myself, so that it is unnecessary to repeat a description of them. Hamilton and McClelland are the only authors who have made original inquiries into the freshwater fishes of Nepal ; and it is evident, from a comparison of Mr. Hodgson's collections with the information drawn from the works of these authors, that the streams and rivers of Nepal must be inhabited by a wonderful variety of generic and specific forms : McClelland enumerating many which

have not been marked by Hamilton as Nepalese, and Mr. Hodgson's collection, again, being composed of species which, although known to Hamilton and McClelland as occurring in other parts of East India, are new to the fauna of Nepal. But the most interesting fact disclosed by these collections is, that several fishes which have been considered as strictly marine forms, and the congeners of which certainly are exclusively inhabitants of the sea, ascend the rivers as far as Nepal. It is much to be regretted that Mr. Hodgson's collection of specimens of Fishes is not as extensive as those which he has made in other branches of zoology. Several of the drawings have been evidently taken from species unknown; yet beautifully as they are executed with regard to their natural coloration and their general form, it would be very hazardous to attempt to introduce them into the system with technical denominations, as the specific distinctions of Fish are chiefly based upon characters (fin-rays, teeth, number of scales, &c.) to which due attention is never paid in drawings executed by a person ignorant of ichthyology.

#### 1. TESTUDO HORSFIELDII.

*Testudo horsfieldii*, Gray, Cat. Shield Rept. p. 7, t. 1.

One coloured drawing.

#### 2. BATAGUR LINEATA.

*Emys lineata*, Gray, Catal. Tort. p. 17.

*Testudo kachuga*, Gray, Ind. Zool. pl. 74.

*Batagur lineata*, Gray, Cat. Shield Rept. p. 35, t. 17.

Shell of one adult specimen, in which the keels of the vertebral plates have entirely disappeared.

#### 3. BATAGUR DHONGOKA.

*Emys dhongoka*, Gray, Ind. Zool. ii. t. .

*Batagur dhongoka*, Gray, Cat. Shield Rept. p. 36, t. 18.

The upper parts of the shells of two adult specimens, and a skull figured by Dr. Gray, Cat. Shield Rept. t. 36. f. 1.

#### 4. TRIONYX GANGETICUS.

*Trionyx gangeticus*, Cuv. Règne Anim.; Gray, Cat. Shield Rept. p. 66.

*Trionyx hurum*, Gray, Ind. Zool. t. .

*Testudo ocellatus*, Gray, Ind. Zool. t. .

Skeleton of the upper shell of two specimens.

#### 5. TRIONYX JAVANICUS.

? *Testudo javanica*, Osbeck, Voy. China, p. 149.

*Trionyx javanicus*, Schweigg. Prod. p. 287; Geoffr. Ann. Mus. xiv. p. 15, pl. 3; Gray, Ind. Zool. t. .

This species is not in Mr. Hodgson's collection, but is supposed to occur in Nepal, having been found in different parts of the East

Indian continent, in China, in the Malayan peninsula, in the Ganges, in the Dukhun, &c.

6. CHITRA INDICA.

*Chitra indica*, Gray, Cat. Shield Rept. p. 70.

The authority for the occurrence of this species in Nepal is Dr. H. Falconer, who has deposited a very large skull of it in the British Museum.

7. GAVIALIS GANGETICUS.

*Lacerta gangetica*, Gm. Syst. Nat. i. p. 1057.

*Crocodylus longirostris et tenuirostris*, Cuv. Ann. Mus. x. t. 1, 2.

*The Narrow-beaked Crocodile*, Edw. Phil. Trans. xlix. p. 639. t. 19.

*Gavialis gangeticus*, Dum. et Bibr. Erpet. génér. iii. p. 134, pl. 26. f. 2.

One stuffed specimen, 33 inches long.

8. EMPAGUSIA FLAVESCENS.

*Monitor flavescens*, Gray, Zool. Journ. iii. p. 228, and Ind. Zool. t. .

*Varanus piquotii*, Dum. & Bibr. l. c. p. 483, pl. 34. f. 5.

*Empagusia flavescens*, Gray, Cat. Liz. p. 9.

Two large stuffed specimens and one coloured drawing.

Lower hills.

9. VARANUS HERALDICUS.

*Varanus heraldicus*, Gray, Cat. Liz. p. 9.

One large stuffed specimen and a coloured drawing.

10. TILIQUA RUFESCENS.

*Lacerta rufescens*, Shaw, Zool. iii. p. 285.

*Tiliqua rufescens*, Gray, Cat. Liz. p. 109.

Two specimens.

11. CALOTES VERSICOLOR.

*Agama versicolor*, Daud. Rept. iii. p. 393, pl. 44 (young).

*Calotes versicolor*, Dum. & Bibr. l. c. iv. p. 805.

Three specimens.

12. PYTHON MOLURUS.

*Coluber molurus*, Linn. Syst. Nat. ii. p. 225.

*Python tigris*, Daud. Rept. v. p. 241, pl. 64. f. 1.

*Bora & Pedda Poda*, Russ. Ind. Serp. t. 39. 22-24.

*Python bivittatus*, Schleg. Phys. Serp. ii. p. 403, pl. 15. f. 1-4, & Abbildg. p. 55, t. 17. f. 11.

*Python molurus*, Gray, Zool. Misc. p. 44.

One coloured drawing.

13. TRACHISCHIUM FUSCUM.

*Calamaria fusca*, Blyth, Journ. As. Soc. Beng. 1855, p. 288.

*Trachischium rugosum*, Gthr. Cat. Col. Sn. p. 30.

*Trachischium fuscum*, Gthr. Proc. Zool. Soc. 1860, p. 161.

Four specimens from Mr. Hodgson's Nepalese collection, and several others from different parts of the Himalayas.

#### 14. SIMOTES OCTOLINEATUS.

*Elaps octolineatus*, Schneid. Hist. Amphib. p. 299; Russell, Ind. Serp. ii. t. 38.

*Simotes octolineatus*, Dum. & Bibr. vii. p. 634.

Two coloured drawings.

This Snake has not been previously known to occur as far northwards as the central hilly region of Nepal. It must be a beautiful little harmless creature when alive, the back being chestnut-brown between the two median black stripes, and the sides blue; a bright purple band, entirely lost in preserved specimens, runs along the middle of the abdomen between two lateral series of black spots.

#### 15. SIMOTES RUSSELLII.

*Coluber russellii*, Daud. Rept. vi. t. 76. f. 2.

*Simotes russellii*, Dum. & Bibr. vii. p. 628.

The Karait.

Two specimens and two coloured drawings.

Central hilly region.

#### 16. SIMOTES PURPURASCENS.

*Xenodon purpurascens*, Schleg. Ess. pl. 3. f. 13, 14; Dum. & Bibr. vii. p. 753; Cant. Catal. p. 67.

*Coronella albocincta*, Cant. Proc. Zool. Soc. 1839, p. 50.

*Simotes albocincta*, Dum. & Bibr. p. 633.

*Coronella puncticulata*, Gray, Ann. & Mag. Nat. Hist.

*Calamaria brachyorrhos*, Motley & Dillw. Nat. Hist. of Labuan, p. 49 (nec auct.), with a beautiful plate.

*Simotes purpurascens*, Gthr. Cat. Col. Sn. p. 25.

One specimen.

The Himalayan specimens are a fine variety of this widely-spread species. The ground-colour is purple, marbled with brown; two or three rows of quadrangular lighter spots along the back, edged with black, the spots sometimes confluent into cross bands; belly whitish, with numerous large, square black spots.

#### 17. ABLABES COLLARIS.

*Psammophis collaris*, Gray, Ann. & Mag. Nat. Hist. 1853, p. 390.

*Ablabes collaris*, Gthr. Catal. Col. Sn. p. 28.

One specimen.

#### 18. ABLABES RAPPUI.

*Ablabes rappui*, Gthr. Proc. Zool. Soc. 1860, p. 154, pl. 26. f. B.

One specimen and a coloured drawing.

The specimen figured by Mr. Hodgson is uniform brown above and whitish below. In the specimen which is figured in the 'Proceedings of the Zoological Society,' some obscure blackish cross bands made their appearance on the anterior part of the side of the trunk when the skin commenced to dry. These bands being very distinct, I considered it possible for some time that *A. owenii* is the young of *A. rappii*. Mr. Hodgson, however, figures a specimen with a very distinct black collar (as in *A. owenii*), which is 21 inches long, and evidently adult; so that both species appear to be really distinct. Both are called "Sirdaghia" in Nepal; and I see from a note of Mr. Hodgson, that having received a small specimen of the uniform species (*A. rappii*) and a large one of the collared (*A. owenii*), he considered the former as the young state of the latter.

#### 19. ABLABES OWENII.

*Ablabes owenii*, Gthr. Proc. Zool. Soc. 1860, p. 155, pl. 26. f. A.

Mr. Hodgson figures a variety of this species: the body is uniform brown, without any cross bands; abdomen whitish; neck with a black collar edged with white posteriorly; crown of the head with two angular blackish cross bands, the convexity of the bands pointing forwards.

#### 20. TROPIDONOTUS QUINCUNCIATUS.

*Tropidonotus quincunciatus*, Schleg. Ess. pl. 12. f. 4, 5.

Var. *Coluber umbratus*, Daud. Rept. p. 144. pl. 7.

Russ. Ind. Serp. ii. t. 5.

*Tropidonotus umbratus*, Schleg. Ess. ii. p. 309.

Eight specimens of nearly the same uniform dark coloration.

#### 21. TROPIDONOTUS STOLATUS.

*Coluber stolatus*, Linn. Syst. Nat. i. p. 379.

Russ. Ind. Serp. i. t. 10, ii. t. 19.

*Tropidonotus stolatus*, Boié, Isis, 1827, p. 535.

The Auhoria.

One specimen and two coloured drawings.

#### 22. TROPIDONOTUS PLATYCEPS.

*Tropidonotus platyceps*, Blyth, Journ. As. Soc. Beng. xxiii. p. 297; Gthr. Proc. Zool. Soc. 1860, p. 162.

The Matia.

This species appears to be a truly Himalayan form, all the specimens known coming from those mountainous regions. The British Museum possesses three from Sikkim, two from Khasia, and one from Nepal, through Mr. Hodgson. A coloured drawing.

#### 23. TROPIDONOTUS CHRYSARGUS.

*Tropidonotus chrysargus*, Boie, Isis, 1827, p. 534; Schleg. Ess. pl. 12. f. 6, 7.

One specimen.

## 24. TROPIDONOTUS CERASOGASTER.

*Tropidonotus cerasogaster*, Cant. Ann. & Mag. Nat. Hist. 1847, p. 92; Gthr. Cat. Colubr. Sn. p. 79.

One coloured drawing of a young specimen.  
Central hilly region.

## 25. COLUBER, sp. ?

A drawing, 12 inches long, represents a Snake of which we have not seen a specimen, but which, if we may judge from the colours, appears to be allied to *Coluber callicephalus*, Gray. A series of broad, rhombic, confluent brown bands edged with black occupies the back; the sides are white dotted with brown; belly whitish. The specimen being very small, the shields of the head and the scales are not represented with sufficient distinctness to admit of a description of their form, number, &c.

Central hilly region.

## 26. SPILOTES HODGSONII.

*Spilotes hodgsonii*, Gthr. Proc. Zool. Soc. 1860, p. 156, pl. 27.  
The Pila Matia.

Two specimens; one drawing unfinished.

## 27. SPILOTES RETICULARIS.

*Coluber reticularis*, Cant. Proc. Zool. Soc. 1839, p. 51.

*Spilotes reticularis*, Gthr. Cat. Col. Sn. p. 98.

The Dorah.

All the eight specimens in the British Museum collection are from the Himalayas, and two of them from Mr. Hodgson's Nepalese collection. Two coloured drawings.

## 28. SPILOTES MELANURUS.

*Coluber melanurus*, Schleg. Abbildg. t. 5.

*Spilotes melanurus*, Gthr. Cat. Col. Sn. p. 97 (nec Dum. & Bibr.).

Two half-grown specimens from Mr. Hodgson's collection have two very conspicuous black longitudinal bands along the back; several of the shields of the head are united, so as to form only six upper and four lower labial shields. The loreal shield, too, has disappeared.

## 29. CORYPHODON FASCIOLATUS.

*Coluber fasciolatus*, Shaw, Zool. p. 528.

*Coryphodon fasciolatus*, Gthr. Cat. Col. Sn. p. 109.

One coloured drawing.

Central hilly region.

## 30. CORYPHODON BLUMENBACHII.

*Coluber blumenbachii*, Merr. Tent. p. 119; Schleg. Ess. pl. 5, f. 7, 8.

*Coryphodon blumenbachii*, Dum. & Bibr. vii. p. 184.

The Dhâmin.

Five specimens and a coloured drawing.

This species, the most common of all the East Indian Snakes, appears to have been lately described as *Leptophis trifrenatus*, Hallow. Proc. Ac. Nat. Sc. Philad. 1860, p. 503.

### 31. CORYPHODON CARINATUS.

*Coluber dhumnades*, Cant. Ann. & Mag. Nat. Hist. 1842, p. 483.

*Coluber nigro-marginatus*, Blyth, Journ. As. Soc. Beng. 1855, p. 291.

*Coryphodon carinatus*, Gthr. Cat. Col. Sn. p. 112.

Two specimens and two coloured drawings.

### 32. LYCODON AULICUS.

*Coluber aulicus*, Linn. Syst. Nat. i. p. 381.

*Lycodon aulicus*, Boié, Isis, 1826, p. 981.

*Lycodon hebe*, Schleg. Ess. ii. pl. 4. f. 1-3.

Two specimens.

### 33. CALLOPHIS MACCLELLANDII.

*Elaps macclellandi*, Reinh. Calc. Journ. Nat. Hist. 1844, p. 532, et Vidensk. Medd. Naturhist. Forem. Kjöbenh. 1860, p. 247.

*Elaps univirgatus*, Gthr. Cat. Col. Sn. p. 232.

*Callophis univirgatus*, Gthr. Proc. Zool. Soc. 1859, pl. 17.

Two specimens; one coloured drawing.

Professor Reinhardt was the first to describe this species from a specimen from Assam, which has a coloration somewhat different from the Nepalese specimens, but which he clearly proves to be of the same species. In the individual from Assam, the black rings are complete across the back, and the black longitudinal streak is absent. Another specimen from Darjeeling, examined by Prof. Reinhardt, rather resembles the larger one in the British Museum. Prof. Reinhardt has proved by dissection that these variations are not dependent on sex, and that they appear to be accidental in the individuals. This is another fact in favour of my assertion that most of the different forms of coloration of the South American *Elaps* are mere varieties, and not species.

The coloration of Mr. Hodgson's drawing does not greatly differ from that of the specimens in spirit.

### 34. NAJA TRIPUDIANS.

*Coluber naja*, Linn. Syst. Nat. i. p. 382.

*Naja tripudians*, Merr. Tent. p. 147.

Having received specimens of the Cobra from different parts of the Himalayas, I cannot doubt that it occurs also in Nepal, although Mr. Hodgson has not sent specimens; he says that it must be very scarce in the central hilly region, at all events much less frequent

than in the low countries ; the coloration becomes uniform dark in specimens from the mountainous districts, as is the case in many other reptiles.

35. *TRIMESURUS VIRIDIS.*

*Trimesurus viridis*, Gray, Viper. Sn. p. 7.

The Sugava Samp.

One coloured drawing.

Central hilly region.

36. *PARIAS MACULATA.*

*Parias maculata*, Gray, Ann. & Mag. Nat. Hist.

One specimen in spirit and another stuffed ; two coloured drawings.

Central hilly region.

37. *RANA TIGRINA.*

*Rana tigrina*, Daud. Rain. p. 46, pl. 20.

The common Frog of the valleys.

Specimens in spirit and one coloured figure.

38. *RANA LIEBIGII.*

*Rana liebigii*, Gthr. Proc. Zool. Soc. 1860, p. 157, pl. 28. f. A.

One specimen and a coloured drawing.

39. *BUFO MELANOSTICTUS.*

*Bufo melanostictus*, Schneid. Hist. Amphib. p. 216.

*Bufo carinatus*, Gray, Ind. Zool. pl. .

Two specimens and a coloured drawing.

The common Toad of the valleys.

40. *POLYPEDATES MACULATUS.*

*Hyla maculata*, Gray, Ind. Zool.

*Hyla leucomystax*, Graven. Delic. p. 26.

*Polypedates maculatus*, Gthr. Cat. Batr. p. 78.

One coloured drawing. The specimen was grass-green during life, back irregularly spotted with greyish-silvery, legs with cross streaks of the same colour.

41. *RHACOPHORUS MAXIMUS.*

*Rhacophorus maximus*, Gthr. Cat. Batr. p. 83.

Three specimens, types of the species.

## FISHES.

1. *SERRANUS SEX-FASCIATUS.*

? *Serranus sex-fasciatus*, Cuv. & Val. Hist. Poiss. ii. p. 360.

The specimen is a dried skin, 6 inches long ; and it is difficult to say whether our determination is correct. The occurrence of a species of *Serranus* in fresh water is a very curious and quite new fact.

## 2. THERAPON SERVUS.

*Holocentrus servus*, Bl. t. 238. f. 1.

*Therapon servus*, Cuv. & Val. iii. p. 125.

*Pterapon trivittatus*, Gray, Ind. Zool. t. . f. 1.

One specimen.

The occurrence of this fish in Nepal is another striking example in favour of the opinion that the species of this genus are freshwater fishes, some occasionally entering the sea. They appear to be one of the genera representing the freshwater Perches of the northern regions in the East Indies.

## 3. DIAGRAMMA CINCTUM.

*Diagramma cinctum*, Schleg. Faun. Japon. Poiss. p. 61, pl. 26. f. 1 (not good).

One dried specimen.

## 4. DIAGRAMMA, sp.

There is another specimen of *Diagramma* in Mr. Hodgson's collection, which we cannot refer to any species known. It is a dried skin 5 inches long. We should have referred it to the genus *Therapon*, its head having quite the form of that of the fishes of that genus, but for the numbers of the fins, which are, D. 12/19, A. 3/9. It would be hazardous to name this apparently new species ; several portions of the skin being distorted and the colours having gone, we could give only an incomplete description of it.

## 5. SCATOPHAGUS ARGUS.

*Chaetodon argus*, Gm. S. N. p. 1248 ; Bl. t. 204. f. 1.

*Chaetodon pairatalis*, Buch. Ham. Fishes of the Ganges, p. 122, pl. 16. f. 41.

*Chaetodon atro-maculatus*, Benn. Fishes of Ceylon, pl. 18.

*Scatophagus argus*, Cuv. & Val. vii. p. 136.

Skin of an adult specimen.

## 6. SILLAGO SIHAMA.

*Atherina sihama*, Forsk. p. 70.

Russell, t. 113.

*Sillago sihama*, Rüpp. Atl. Fische, p. 9, t. 3. f. 1.

Skin of an adult specimen.

This species has not been known hitherto as entering fresh water. There may be some doubt with regard to the specific determination of the species in consequence of the bad condition of the example ; yet, even if it be a species different from *S. sihama*, the fact would not be the less curious, as none of the other species are known to occur at so great a distance from the sea.

## 7. OTOLITHIUS ARGENTEUS.

*Otolithus argenteus*, (Kuhl & v. Hass.) Cuv. & Val. v. p. 62.

Skin of an adult specimen.

This is another marine species, penetrating to Nepal.

## 8. TRACHYNOTUS OVATUS.

*Gasterosteus ovatus*, Linn. Syst. Nat. i. p. 490.

*Mookalee-parah*, Russ. ii. p. 39, pl. 154.

*Trachynotus ovatus*, Gthr. Acanthopt. Fish. ii. p. 481.

Skin of a half-grown specimen.

A species found from between the tropics in the Atlantic and Indian Oceans to the coasts of Australia. I do not know of another instance where the species has been found in a river.

## 8a. GOBIUS GIURIS.

"*Gobius giuris*, Buch. Ham.," Gthr. Acanthopt. Fishes, iii. p. 21.

One specimen.

## 9. OPHIOCEPHALUS PUNCTATUS.

*Ophiocephalus punctatus*, Bl. t. 358.

*Ophiocephalus latus*, Buch. Ham. Fishes of the Ganges, pp. 63, 637, pl. 34. f. 18.

The Bhoti.

An adult specimen and a coloured drawing.

## 10. OPHIOCEPHALUS BARCA.

*Ophiocephalus barca*, Buch. Ham. Fishes of the Ganges, p. 67, pl. 35. f. 20; Gthr. Acanthopt. Fishes, iii. p. .

The Pâtliah Bând.

Two coloured drawings.

I am not quite certain about the correctness of my determination, as the drawing represents a very light-coloured, uniform fish, whilst the true *barca* is dark and dotted with black. The forms, however, are the same in both.

## 11. MUGIL NEPALENSIS.

*Mugil nepalensis*, Gthr. Acanthopt. Fishes, iii. p. .

One specimen. Type of the species.

## 12. MASTACEMBELUS ARMATUS.

*Macrogathus armatus*, Lacép. ii. p. 286; Buch. Ham. Fishes of the Ganges, pp. 28, 364, pl. 37. f. 6.

*Mastacembelus armatus*, Gthr. Acanthopt. Fishes, iii. p. .

One young specimen.

## 13. PIMELODUS CENIA.

A sketch of a Siluroid, executed with pencil, has been probably taken from *Pimelodus cenia*, Buch. Ham. p. 174, pl. 31. f. 57.

## 14. PIMELODUS BAGARIUS.

*Pimelodus bagarius*, Buch. Ham. Fish. Gang. p. 186, pl. 7. f. 62; Cuv. & Val. xv. p. 146, pl. 433.

The Goonch.

A coloured drawing in Mr. Hodgson's collection appears to have been taken from a specimen of this species. It agrees with the latter in the form of the barbel and of the fins, but is of a more uniform coloration. A very young specimen in spirit has the fin-rays not prolonged into filaments.

## 15. CHACA LOPHIOIDES.

*Platystacus chaca*, Buch. Ham. Fish. Gang. p. 140, pl. 28. f. 43.

*Chaca lophioides*, Cuv. & Val. xv. p. 445, pl. 451.

One stuffed specimen.

## 16. SILUNDIA GANGETICA.

*Pimelodus silundia*, Buch. Ham. Fish. Gang. p. 160, pl. 7. f. 50.

*Silundia gangetica*, Cuv. & Val. xv. p. 49.

The Choojh.

One coloured drawing and skin in spirit.

## 17. SACCOBRANCHUS FOSSILIS.

*Silurus fossilis*, Bl. t. 370. f. 2.

*Silurus singio*, Buch. Ham. p. 147, pl. 37. f. 46.

*Saccobranchus fossilis*, Cuv. & Val. xv. p. 401, pl. 448.

The Singhi.

One coloured drawing.

## 18. BARBUS MOSAL.

*Cyprinus mosal*, Buch. Ham. Fish. Gang. p. 388.

*Barbus megalepis*, Gray, Ind. Zool. pl. 93. f. 1; MacClell. Cyprin. p. 271.

*Barbus mosal*, Cuv. & Val. xvi. p. 200.

The Máhásér.

Two finished and coloured drawings, and a pencil sketch of the head.

## 19. BARBUS BRACHIATUS.

*Leuciscus brachiatus*, MacClell. Cypr. p. 409, pl. 42. f. 5.

*Barbus brachiatus*, Bleek. Verh. Batav. Genootsch. xxv., Beng. & Hind. p. 19.

One coloured drawing and several specimens in spirits.

The barbels are very small, and have been overlooked in Mr. Hodgson's drawings; yet the form of the humerus and the black dots at the base of the scales are two characters so peculiar that the species is not easily mistaken. Mr. Hodgson adds, that the species is found in streams of hills.

## 20. LABEOBARBUS HEXASTICHUS.

*Barbus hexastichus*, MacClell. Ind. Cypr. p. 269, pl. 39. f. 2.

*Labeobarbus hexastichus*, Bleek. Cyprin. p. 385.

Several specimens in spirit; one coloured drawing and two pencil sketches of the head.

## 21. OREINUS MACULATUS.

? *Cyprinus richardsonii*, Gray, Ind. Zool. pl. 94. f. 2.

*Oreinus maculatus*, MacClell. Cyprin. p. 345, pl. 57. f. 6.

The Asla.

Several coloured drawings of adult and young fishes. Two stuffed specimens.

## 22. OREINUS HODGSONII.

The Long-nosed Asla.

Three coloured drawings and one stuffed specimen 21 inches long. D. 2/7, A. 7. Snout much produced, longer than the part of the head behind the orbit. The height of the body is one-fifth of the total length (the caudal fin not included), the length of the head one-fourth. Scales very small. The dorsal fin is short and elevated, rather higher than the body below; the second spine is very strong, serrated posteriorly\*. The origin of the dorsal fin is exactly on the middle between the extremity of the snout and the base of the caudal fin; base of the ventral below the middle of the dorsal. Coloration as in the common Asla (*Oreinus maculatus*).

## 23. OREINUS, sp.

Two coloured drawings and pencil sketches of the mouth.

We are not able to refer this fish to a known species; it appears to be allied to *Barbus diplocheilus* of Heckel (Fische v. Kaschmir, t. 10. f. 1), having a similarly serrated upper lip; but the Nepalese species is more elongate, has somewhat smaller scales, and the snout considerably more produced. The greatest depth of the body equals the length of the head, and is one-fifth of the total (the caudal fin not included). The dorsal fin is somewhat higher than long and than the body below, and occupies nearly the middle of the back; the ventral is inserted below the hinder third of the dorsal fin. The figure shows nine dorsal and five anal rays. Brown above, each scale with a dark dot, the dots being very well marked on the back of the tail. The lower parts silvery.

## 24. OREINUS, sp.

One coloured drawing and sketches of the mouth.

This is a third species which we believe to be new, but we abstain from naming it as long as we have no actual specimens for examination; the scales are of moderate size, larger than in any of the

\* This spine is injured in the specimen, but its size may be clearly seen in the drawings.

preceding species; the snout is obtusely conical; the cleft of the mouth transverse, crescent-shaped, with the lower lip apparently forming a rounded protuberance. Barbels minute. The greatest depth of the body is one-fourth of the total length (the caudal fin not included), the length of the head two-ninths. The dorsal fin is higher than long, and lower than the body below; the ventral fin is inserted vertically somewhat behind the middle of the dorsal. Above brownish-olive, whitish below; each scale with a silvery spot. Length of the drawing 5 inches.

#### 25. ROHITA MICROLEPIDOTA.

One stuffed specimen, 10 inches long.

D. 16, A. 8, V. 10, L. lat. 75, L. transv. 15/12. The height of the body is one-fourth of the total length (the caudal fin not included), the length of the head nearly one-fifth. The distance of the dorsal fin from the occiput equals that from the caudal fin; the base of the ventral is immediately behind the vertical from the middle of the dorsal fin; the anal occupies the middle of the interspace between the dorsal and caudal fins; pectoral as long as the head. Uniform silvery, back greenish.

The specimen being dried, I was unable to ascertain the position and size of the barbels, which, if present, appear to be small. There is, however, little doubt that this fish really belongs to the genus indicated.

#### 26. COBITIS SCATURIGINA.

*Cobitis scaturigina*, Buch. Ham. MS.

*Schistura scaturigina*, MacClell. Ind. Cypr. p. 443, pl. 53. f. 6.

One coloured drawing.

“Fish of valleys, in mud of fields and small creeks.”—*Hodgs.*

#### 27. CIRRHINA REBA.

*Cyprinus reba*, Buch. Ham. Fish. Gang. p. 280.

*Cirrhina reba*, Cuv. & Val. xvi. p. 292.

One coloured drawing with sketches of the head.

This drawing represents a fish with darker transverse bands, whilst they are generally longitudinal in other specimens. Buchanan Hamilton says that the colours are subject to much variation in this species.

#### 28. LOBOCHEILUS RICNORHYNCHUS.

*Gobio ricnorhynchus*, MacClell. Cyprin. pp. 279, 363, pl. 55. f. 1.

*Lobocheilus ricnorhynchus*, Bleek. Verhand. Batav. Genootsch. xxv. Beng. & Hind. p. 66.

The Lhooi.

Two coloured drawings and a pencil sketch of the mouth.

#### 29. LOBOCHEILUS GOBIOIDES.

? *Cyprinus mosario*, Buch. Ham. Fish. Gang. p. 346.

*Gonorhynchus gobioides*, MacClell. Cypr. p. 369, pl. 43. f. 1.

A coloured drawing and a pencil sketch of the head.

This species, or at least the fish represented by Mr. Hodgson, is closely allied to *L. rionorhynchus*, but may be readily distinguished by its smaller scales and its lighter coloration. It is light brownish-olive on the back, and silvery below; each scale on the side with a short vertical red line.

30. *CATLA BUCHANANI*.

*Cyprinus catla*, Buch. Ham. p. 287, pl. 13. f. 81.

*Catla buchanani*, Cuv. & Val. xvii. p. 411, pl. 515.

The Cutler.

Two coloured drawings.

The vernacular name, assigned by Mr. Hodgson to this well-known species, is evidently the same as that which is written "*Catla*" by Buchanan.

31. *CHATOËSSUS MANMINA*.

*Chupanodon manmina*, Buch. Ham. Fishes of the Ganges, p. 247.

*Chatoëssus manmina*, Cuv. & Val. xxi. p. 114.

One specimen.

I find a species of *Chatoëssus* mentioned in the list of specimens presented by Mr. Hodgson to the British Museum. This specimen is, at present, mislaid, and I have not had an opportunity of examining it; it is very probable that it belongs to this species, which is found in most of the freshwater branches of the Ganges.

32. *LEIURANUS*, sp.

One coloured drawing.

This species appears to be very closely allied to *Muraena colubrina*, Bodd., or *M. annulata*, Thunb., but is spotted with blackish-brown, instead of having dark bands across the back.

33. *ANGUILLA BENGALENSIS*.

*Muraena maculata*, Buch. Ham. Fish. Gang. p. 23 (nec syn.).

*Muraena bengalensis*, Gray, Ind. Zool.

*Anguilla variegata*, MacClell. Calc. Journ. Nat. Hist. v. p. 179, pl. 5. f. 2.

*Anguilla elphinstonei*, Sykes in Trans. Zool. Soc. ii. p. 377, pl. 67. f. 3.

One coloured drawing.

34. *ANGUILLA*, sp.

One coloured drawing.

We are much inclined to consider the fish represented as a mere variety of *A. bengalensis*, with which it entirely agrees in its form, except that it appears to have a wider cleft of the mouth, extending far behind the orbit. From the purplish colour, variegated with white and black specks, Mr. Hodgson calls it the "Purple Eel," "*A. porphyrea*." The drawing is 14 inches long, and stated to be

one-third of the natural size. The specimen was caught in the month of April in the Rosi Khola, a clear hill-stream of the central region of Nepal.

#### 4. ON A COLLECTION OF REPTILES FROM GUATEMALA.

BY OSBERT SALVIN, M.A., F.Z.S.

The collection, of which the present paper is a list, was formed during the past twelve months by Mr. Robert Owen, Corresponding Member of this Society, at San Gerónimo and the neighbouring mountains in the province of Vera Paz. In a former paper, Dec. 1860, I gave a short account of the collections I made in Guatemala. The present series adds five species of Snakes to that list, making a total of twenty-four species, a number which doubtless falls considerably short of the whole number of species inhabiting Guatemala. In determining the species I have availed myself of Dr. A. Günther's assistance and of the specimens in the British Museum.

##### 1. STREPTOPHORUS SEBÆ, Dum. & Bibr.

Several specimens.

##### 2. HOMALOCRANION ATROCINCTUM, Dum. & Bibr.

In a single specimen in the collection there are sixty-two black rings on the body and nine on the tail. These rings are twice the width of the yellow intervals, and are confluent on the belly. Along the dorsal series is a line of red interrupted by the black rings.

##### 3. CORONELLA DOLIATA, Linn.

Adult and young.

The red colouring in the young is not shown, though very clear in the adult.

##### 4. PLEIOCERCUS ÆQUALIS, n. sp.

Scales in 17 rows; 8 upper labials; tail two-fifths of the whole length; body and tail banded throughout with equidistant black bands.

Body long and slender, slightly compressed anteriorly; tail very long and tapering; head depressed, broader posteriorly, snout obtuse, crown flat, eye moderate; rostral shield small, slightly convex, just reaching to the upper surface; anterior frontal shields small, pentagonal, obtuse; posterior frontals large, three times the size of the anterior frontals, quadrangular, bent on the sides; vertical short, rather longer than broad, outer edges slightly converging, posterior angle nearly a right angle; occipitals large, rounded behind; anterior ocular reaches the upper surface of the head, but not to the vertical; loreal pentagonal, on one side united with the frontal; nostril in the middle of two shields; eight upper labials, the fourth and fifth reaching to the orbit; scales in 17 rows, in rather oblique series, those of the back narrower than those of the sides; anal bifid; ventral plates 131, caudal 92.

*Coloration*.—Ground-colour red, yellow beneath; upper portion of the head black as far as the anterior portion of the occipital shields. Twenty-seven black bands on the body, occupying a space equal to each red interval. The intervals between each black ring irregularly marked with black markings, which become more defined and stronger on the posterior portion of the body. Tail banded with 16 black rings. The intervals between each black ring have a black mark on the upper surface, so large as nearly to obliterate the red ground-colour. Maxillary teeth gradually increasing in length; last pair larger than the rest, and separated by an interspace.

The type of the genus *Pleiocercus* is *P. elapoides* of Cope, Pr. Ac. Nat. Sc. Philad. 1860, p. 253. The description is taken from Mexican specimens collected by Señor R. M. de Oca near Jalapa. *Elapochrus deppei*, Peters, appears to be quite identical with *Pleiocercus elapoides*; but as the latter name has the priority of two days over Dr. Peters' description, Mr. Cope's genus and species must stand. The present species is closely allied to *P. elapoides*; the arrangement of the coloration in equidistant bands instead of triads with yellow intervals, and the existence of an interspace between the last pair and the rest of the maxillary teeth, however, entitle it to specific separation.

There was but one specimen in the collection, adult and in very perfect preservation.

5. *STENORHINA VENTRALIS*, Dum. & Bibr.

One adult specimen.

6. *TROFIDONOTUS ORDINATUS*, Linn.

Not nearly so numerous at San Gerónimo as at Dueñas.

7. *ISCHNOGNATHUS DEKAYI*, Dum. & Bibr.

8. *SPILOTES CORAIS*, Cuv.

Two large specimens, measuring nearly 7 feet each.

9. *DIPSADOMORPHUS BISCUTATUS*, Dum. & Bibr.

One specimen in the collection. This has the scales in 27 rows. Of the examples in the British Museum one has the scales in 26 rows, another in 24, and one in my own collection from Lanquin in Vera Paz in 24 rows.

10. *BOA CONSTRICTOR*, Linn.

Three specimens, the largest measuring 5 ft. 6 in.

11. *ELAPS CORALLINUS*.

There are five specimens of *Elaps* in the collection, all belonging to the southern form *E. corallinus*. In all of these the snout is black as far as the anterior portion of the vertical shield, and the first black ring commences across the posterior portion of the occipital shields.





G.B.Sowerby, del et lith.

W West, imp

- 1. *Neritina wallacei* (Dohrn)
- 2. *N. pritchardi* (Dohrn)
- 3. *Mitra aurora* (Dohrn)
- 4. *M. arabica* (Dohrn)
- 5. *Fidromus cumingii* (Dohrn)
- 6. *Bulimus seemanni* (Dohrn)
- 7. *B. glaucolarynx* (Dohrn)
- 8. *B. semipollucidus* (Tristram)
- 9. 10. *Helicina salvini* (Tristram)
- 11. *Macroceramus polystreptus* (Tristram)

No. 1 has 15 black rings on the body and 5 on the tail; each ring has an ill-defined yellow margin. The rings on the trunk occupy a series of 8 scales (reckoned obliquely), and the intervals a series of 18. The rings on the tail occupy a series of 17 scales, and the intervals 6. Ventral plates 211, caudal 53.

No. 2 has 20 black rings on the trunk and 7 on the tail. Each ring is edged with yellow, and occupies a series of 6 scales, the intervals occupying 11. On the tail the black rings occupy a series of 10 scales, and the intervals 4. Ventral plates 215, caudal 60.

No. 3 has 13 black rings on the trunk and 5 on the tail. Each ring is narrowly edged with yellow on the trunk; each ring occupies a series of 10 scales, and the intervals a series of 22. The rings on the tail occupy a series of 20 and the intervals of 4 scales. In the intervals each scale is tipped with a black spot, the spots being larger on some scales than on others. Ventral plates 206, caudal 52.

No. 4 has 17 black rings on the trunk and 6 on the tail, without yellow margins. Each ring occupies a series of 7 and the intervals of 18 scales. On the tail the rings occupy 12 and the intervals 5 scales. Ventral plates 208, caudal 52.

No. 5 has 20 black rings on the trunk and 8 on the tail. Each ring occupies a series of 7 scales, and each interval, including the yellow margins, which are clearly defined and occupy 2 scales, 15 scales. Each scale in the intervals clearly tipped with black, and the ventral plates marked with irregular black spots. On the tail each ring occupies  $7\frac{1}{2}$  scales, and the intervals 5 scales. Ventral plates 211, caudal 54.

12. *CROTALUS HORRIDUS*, Linn.

One specimen nearly 4 ft. long, with three joints in the rattle.

13. *HYLA HOLOCHLORA*, Salvin, P. Z. S. 1860, p. 460, pl. 32. f. 2.

14. *EMYS VENUSTA*, Gray, Cat. Shield Rep. p. 24, pl. 12 *a*.

A young example, in which the costal plates have a regular ring of orange edged with a black margin, and a black spot in the centre. On the dorsal plates this ring is interrupted, an orange stripe on each side running in the direction of the back. These colours are much more clearly defined and regular than in *Emys ornata*.

5. CATALOGUE OF A COLLECTION OF TERRESTRIAL AND FLUVIATILE MOLLUSKS, MADE BY O. SALVIN, ESQ., M.A., F.Z.S., IN GUATEMALA. BY THE REV. H. B. TRISTRAM, CORR. MEM. Z. S.

(Plate XXVI.)

This collection consists of forty-nine species, of which sixteen appear to be hitherto undescribed. The species collected by Mr. Salvin seem to have a comparatively limited range; for though a few are found

in Mexican collections, the greater portion of those hitherto described have been observed only in Guatemala by M. Moricand and others. With the exception of one or two, as *Achatina octona*, of universal occurrence in the warmer regions of the New World, none are identical with West Indian species, and the new species show close generic affinities with the shells of the northern regions of South America.

1. *HELIX GHIESBREGHTI*, Nyst.

The largest and most magnificent species of *Helix* in the New World, and rivalling in size the *Helix ituderii* of Madagascar.

2. *HELIX EXIMIA*, Pfr.

3. *HELIX LALLIANA*, Pfr., var.

4. *HELIX EURYOMPHALA*, Pfr.

Closely allied to *Helix laxata* of South America.

5. *HELIX COACTILIATA*, Fér.

6. *BULIMUS PAZIANUS*, D'Orb.

7. *BULIMUS MORICANDI*, Pfr.

8. *BULIMUS HONDURATIANUS*, Pfr.

9. *BULIMUS DYSONI*, Pfr.

10. *BULIMUS SEMIPELLUCIDUS*, nov. spec. (Pl. XXVI. fig. 8.)

Allied to *B. discrepans*, Sowerby.

*T. imperforata, oblongo-conica, fragilis, nitida, semipellucida, alba, strigis opacis sparse signata; spira conica, acuta; sutura profunda; anfract. 6, convexi, ultimus spiram paulo superans, inflatus, basi rotundatus; columella verticalis, stricta; apertura vix obliqua, angulato-ovalis; peristoma tenue, margine dextro minime expanso, margine columellari breviter reflexo.*

Long. 18, diam. 8 mill.

11. *SUCCINEA PUTRIS* (?), Linn.

12. *GLANDINA GHIESBREGHTI*, Pfr.

13. *GLANDINA CARMINENSIS*, Morelet.

Described by Morelet from Costa Rica.

14. *ACHATINA* — (species doubtful).

15. *ACHATINA OCTONA*, Lam.

16. *SPIRAXIS LATTREI*, Pfr.

17. *SPIRAXIS SHUTTLEWORTHII*, Pfr.

## 18. SPIRAXIS COBANENSIS, nov. spec.

*T. elongato-oblonga, tenuis, nitida, vitrea, pellucida; spira brevis, conica, obtusa; sutura laevis; anfract. 5, planiusculi, ultimus antice descendens  $\frac{7}{10}$  longitudinis formans, basi rotundatus; lamina columellaris funiculata, intorta; apertura verticalis, inverse pyri-formis; peristoma simplex, margine dextro medio valde dilatato et compresso.*

Long. 18, diam. 5 mill.

## 19. SPIRAXIS — (spec. dub.).

## 20. LEPTINARIA EMMELINÆ, nov. spec.

*T. elongata, tenuiuscula, opaca, nitida, vix striatula; spira conica, acuminatuscula; anfract. 7-8, convexi, ultimus spira vix æqualis, sublævigatus; columella intorta, intus lucide albida; peristoma vix expansum, margine dextro compresso; apertura dente acuto superne munita.*

Long. 15, diam. 5 mill.

## 21. LEPTINARIA ELISÆ, nov. spec.

*T. conico-ovata, tenuiuscula, semipellucida, nitida, delicatissime striata; spira obtusa, conica; sutura profunda; anfr. 5-6, convexi, ultimus spiram dimidio superans, sublævigatus; columella intorta, intus margaritaceo-albida; peristoma expansum, margine dextro sulcato compresso; apertura in margine interno acute unidentata.*

Long. 10.5, diam. 6 mill.

## 22. CYLINDRELLA GHIESBREGHTI, Pfr.

## 23. CYLINDRELLA SALPINX, nov. spec.

*T. rimata, cylindraceo-turrita, sordide albida; spira medio ventrosior, apice subtruncata, profunde oblique striata; sutura profunda; anfract. superst. 15, convexi, penultimus semiplicatus, ultimus antice ascendens, basi distincte carinatus, et longe protractus; apertura verticalis, oblique ovalis; perist. continuum, undique large expansum.*

Long. 11, diam. 2 mill.

## 24. PHYSA SOWERBYANA, D'Orb.

## 25. PHYSA PURPUROSTOMA, nov. spec.

*T. elliptico-ovata, fusco-cornea, nitidissima, diaphana; spira conica, brevis, apice acuta; anfract. 4-5, vix convexi, ultimus  $\frac{4}{5}$  longitudinis formans; sutura minime depressa; apertura conico-ovalis, margine externo expanso; columella in adult. purpurascens, in juv. rosea, albo-marginata.*

Long. 22, diam. 11 mill.

*Hab.* Lake of Dueñas.

## 26. PLANORBIS CORPULENTUS, Say.

27. PLANORBIS TUMIDUS, Pfr.

28. PLANORBIS WYLDI, nov. spec.

*T. discoidea, tenuis, turgida, fusco-cornea, haud nitens, aspere striata, supra profunde umbilicata, subtus plano-concava; anfract. 5, rotundati, modice crescentes; apertura obliqua, sublunaris, subtus valde depressa, supra dilatata.*

Diam. maj. 15, min. 11 mill., alt. 8 mill.

*Hab.* Lake of Dueñas.

29. PLANORBIS DUENASIANUS, nov. spec.

*T. discoidea, tenuis, albido-cornea, tenerrime striata, pellucida, haud nitens, supra concava, depressa, subtus plana; anfract. 6, lente accrescentes, ultimus acute sed minutissime carinatus; apertura obliqua, rhomboideo-compressa.*

Diam. maj.  $7\frac{1}{2}$ , min.  $6\frac{1}{2}$  mill., alt. 1 mill.

*Hab.* Lake of Dueñas.

30. PLANORBIS.

Undescribed in coll. Cuming.

31. SEGMENTINA DONBILLI, nov. spec.

*T. compressa, albido-cornea, tenuiter striata, superne et infra similiter umbilicata, convexiuscula; anfract. 5, lente accrescentes, rotundati; apertura obliqua, rotundata; perist. intus albo-labiatum, dentes 6 intus ostendens, quatuor in pariete externa, duo in par. interna.*

Diam. maj. 9, min. 7 mill., alt.  $2\frac{1}{2}$  mill.

*Hab.* Lake of Dueñas.

32. MELAMPUS FASCIATUS, Chemn.

*Hab.* Salt marshes on the coast.

33. ADAMSIELLA OSBERTI, nov. spec.

*T. rimato-perforata, turrata, integra, pallide fulva, longitudinaliter conferte striata, fasciis 5 vel 6 interruptis rubris ornata; spira regulariter turrata, apice plerumque abrupta; anfr. 6, ultimus solutus; apertura verticalis, rotunda; perist. duplex, internum castaneum, breviter porrectum, externum dilatatum, horizontaliter patens, rufescens, superne angulate productum, ad anfr. penultimum subexcisum.*

Long. 12, diam. 5-6 mill.

34. CISTULA TROCHLEARIS, Pfr.

35. CHONDROPOMA RUBICUNDUM, Morelet.

36. MEGALOMASTOMA SIMULACRUM, Morelet.

Described by Morelet from Costa Rica.

37. CYCLOPHORUS PONDEROSUS, Pfr.

38. CYCLOPHORUS TRANSLUCIDUS, Sow.

39. *MACROCERAMUS POLYSTREPTUS*, nov. spec. (Pl. XXVI. fig. 11.)

*T. conico-elongata, integra, albida, semipellucida, vix umbilicata, striis obliquis conferte ornata, et fasciis opacis irregulariter picta; spira regulariter turrata, apice acutissima castanea; anfract. 12-14, convexi, ultimus non solutus; sutura crenulata multis strigis contractis; apertura verticalis, rotundata; perist. albidum, subdilatum.*

Long. 16, diam. 4 mill.

40. *HELICINA SALVINI*, nov. spec. (Pl. XXVI. figs. 9, 10.)

*T. globoso-turbinata, solidula, polita, vix striata, pallide citrina, fasciis duabus castaneis, inferiore contractiore, superiore latiore, cincta; spira turbinata, acuta; anfract. 6, vix convexiusculi, ultimus rotundatus, spiram dimidio superans; columella brevis, basi subsimplex, callum emittens tenuem; apertura obliqua, semilunaris; perist. aureum, late expansum, et reflexiusculum, ad carinam rostratum et in cornu elongatum extensum.*

Diam. maj.  $14\frac{1}{2}$ , min. 12 mill., alt. 9 mill.

Nearly allied to *H. turbinata*, Wieg., from Mexico.

41. *HELICINA AMÆNA*, Pfr.42. *HELICINA OWENIANA*, Pfr.43. *HELICINA MERDIGERA*, Sallé.

Described by Sallé from Nicaragua.

44. *HELICINA LINDENI*, Pfr.45. *HELICINA CHRYSÆIS*, nov. spec.

*T. acuto-conica, solidula, striatula et subgranulata, aurantiaca, parum nitida; spira acuto-conoidea; sutura profunda; anfr. 6, planiusculi, ultimus spira brevior, peripherio subcarinato, basi circa callum flavo-aurantiacum straminea; apertura angulato-rotundata; columella arcuata; perist. expansum, reflexiusculum, albo-limbatum.*

Diam. 3, alt. 4 mill.

*Hab.* Mountain forests of Vera Paz.

46, 47, 48. Three species of *PALUDINELLA*, apparently undescribed.

49. *PACHYCHEILUS CORVINUS*, Morelet.

This magnificent *Melania* appears to attain a greater size in the streams of Guatemala than in any of its previously noted habitats.

My grateful thanks are due to Mr. Cuming for his kind and ready assistance in determining the species.

---

The following list of the additions made to the Menagerie during the months of March and April was read to the Meeting:—

## MARCH.

		Presented by
1 Aoudad .....	<i>Ovis tragelaphus</i> .....	Sir J. Gaspard Le Marchant.
1 Addax .....	<i>Addax nasomaculata</i> .....	
3 Dorcas Gazelles .....	<i>Gazella dorcas</i> .....	Andrew Downs, Esq.
22 American Quails .....	<i>Ortyx virginiana</i> .....	
2 Muscovy Ducks .....	<i>Cairina moschata</i> , var. ....	W. F. Bartlett, Esq., R.N.
1 Red-winged Parrakeet ..	<i>Aprosmictus erythropterus</i> ..	R. Marshall, Esq.
1 Lizard from Natal .....	<i>Regenia albogularis</i> .....	Purchased.
1 Dorcas Gazelle .....	<i>Gazella dorcas</i> .....	
1 Two-spotted Paradoxure ..	<i>Nandinia binotata</i> .....	
2 Red-rumped Parrakeets...	<i>Psephotus hæmatorrhous</i> ..	
2 Many-coloured Parrakeets	<i>Psephotus multicolor</i> .....	
1 Yarrell's Curassow .....	<i>Crax carunculata</i> .....	
1 Japanese Green Dove ..	<i>Calenas</i> — ? .....	
1 Wallaby .....	<i>Halmaturus</i> — ? .....	
1 Sooty Phalanger .....	<i>Phalangista vulpina</i> , var.	
2 Pink-footed Geese .....	<i>Anser phænicopus</i> .....	
1 Green Monkey .....	<i>Cercopithecus sabæus</i> .....	
2 Common Pheasants .....	<i>Phasianus colchicus</i> .....	
2 Red-legged Partridges ..	<i>Caccabis rufa</i> .....	

Of these, *Regenia albogularis* was stated to have been exhibited for the first time.

## APRIL.

		Presented by
3 Cape Hyrax .....	<i>Hyrax capensis</i> .....	His Ex. Sir G. Grey, F.Z.S.
1 Vervet Monkey .....	<i>Cercopithecus delalandii</i> ..	Lieut Gilmour.
2 Tinamous .....	<i>Tinamus variegatus</i> .....	John Blount, Esq.
34 Chinese Sand-Grouse ..	<i>Syrrhaptus paradoxus</i> ..	Hon. J. F. Stuart Wortley.
1 Kangaroo .....	<i>Macropus gigas</i> (♀) .....	Alexander Huth, Esq.
3 Shanghai Sheep .....	<i>Ovis aries</i> , var. ....	Capt. Cruikshank.
2 Chinese Geese .....	<i>Anser sinensis</i> .....	
1 Indian Rock Snake .....	<i>Python molurus</i> .....	James Clark, Esq.
1 Rhesus Monkey .....	<i>Macacus rhesus</i> .....	D. Wilson, Esq.
4 Chinese Sand-Grouse .....	<i>Syrrhaptus paradoxus</i> ..	Capt. Hand.
1 Honduras Turkey .....	<i>Meleagris ocellata</i> .....	Robert Owen, Esq., Corr. Mem. Z.S.
1 Globose Curassow .....	<i>Crax globicera</i> .....	
1 Guan .....	<i>Penelope purpurascens</i> ..	
1 Tinamou .....	<i>Tinamus robustus</i> .....	
2 Tree-Colins .....	<i>Dendrortyx leucophrys</i> ..	Purchased.
1 Crested Eagle .....	<i>Spizaëtus occipitalis</i> .....	
1 African Hawk .....	<i>Astur monogrammicus</i> .....	
2 Saddle-billed Storks .....	<i>Mycteria senegalensis</i> .....	
1 King Parrot .....	<i>Aprosmictus scapulatus</i> ..	
2 Pennantian Parrakeets ..	<i>Platycercus pennantii</i> ..	
2 Chameleons .....	<i>Chamæleo africanus</i> .....	
1 Chacma Baboon .....	<i>Cynocephalus porcarius</i> ..	
6 Golden-eye Ducks .....	<i>Clangula glaucion</i> .....	
1 pair Scaup Ducks .....	<i>Fuligula marila</i> .....	
1 Manilla Cockatoo .....	<i>Cacatua philippinarum</i> ..	
3 Cereopsis Geese .....	<i>Cereopsis novæ hollandiæ</i>	
1 Stone-chat .....	<i>Pratincola rubicola</i> .....	
1 Green Pigeon .....	<i>Calenas</i> — ? .....	
2 Bichenow's Finches .....	<i>Estrelida bichenovii</i> .....	
2 Phaëton Finches .....	— <i>phaëthon</i> .....	
2 Red-tailed Finches .....	— <i>ruficauda</i> .....	
2 Banded Finches .....	<i>Poëphila cincta</i> .....	
2 Chestnut-breasted Finches	<i>Donacola castaneo-thorax</i>	

June 11th, 1861.

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

The Secretary read the following extracts from a letter addressed to him by Robert Swinhoe, Esq. (Corr. Memb.), dated "British Consulate, Amoy, China, April 5th, 1861."

"I see, in the 'Annals and Magazine of Natural History' for February 1861, page 143, on the Japanese Deer, that a mistake has occurred, owing to incorrect information. Mr. Blyth describes a Deer under the name *Cervus taiouanus*, from the skull of an adult I sent him. This was procured from the Formosan Deer, supposed to be *C. pseudaxis*. Subsequently I sent him four living Deer, which I distinctly informed him were received from Japan; but whether through inability to read my letter, or for some reasons to me unknown, he set down in his belief that the old buck was from Formosa and the other three from Japan. All four of the Deer sent him were from Japan, and the skull alone from Formosa. There can be no possible doubt that the former belong to the Japanese species *C. sika*, Temm. et Schleg., of the 'Fauna Japonica.' That the Formosan Deer is distinct from the Japanese I have no shadow of doubt, from the various opportunities I have had of comparing the animals from the two different places. The old Formosan bucks stand at least one foot higher than the Japanese bucks, and their horns are somewhat flattened at the end. One of the former has been sent by the Dutch consul here to Leyden. I am doing my utmost to procure a pair of these handsome animals for the Zoological Gardens. I am told that a Stag is also found near Ningpo, but have never seen examples. The large species from the north found in the Summer Palace Gardens, of which I have sent three skins to the Society, you will be able to determine as soon as the 'Harkaway,' in which vessel they were shipped, arrives in England. If the Zoological Society will remunerate the masters of the vessels for the conveyance of live Deer to England, I dare say I can manage to defray all expenses here in procuring the animals."

Dr. Gray made some observations on an immature specimen of an Antelope in Capt. Speke's collection from Zanzibar, which he was inclined to refer to a new species of *Calotragus*.

Dr. A. Günther exhibited, on the part of Mr. J. Y. Johnson, an example of the singular Fish described under the name of *Saccolarynx flagellum* by Dr. Mitchell, and *Ophiognathus ampullaceus* by Dr. Harwood. This had been obtained at Madeira by Mr. Johnson, and, when captured, contained in its stomach a large specimen of a Gadoid Fish.

Mr. Leadbeater exhibited some very fine examples of the heads and horns of the *Ovis ammon* of the Himalayas, belonging to Major Edwardes.

The following papers were read:—

1. NOTICE OF A STAG FROM NORTHERN CHINA SENT BY MR. SWINHOE TO THE ZOOLOGICAL SOCIETY. BY DR. JOHN EDWARD GRAY, F.R.S., V.P.Z.S., ETC.

(Plate XXVII.)

Mr. Swinhoe has most kindly sent to us three examples of a Deer which were shot in the Gardens of the Summer Palace at Peking in the winter of 1860.

There is a skin of an adult male with horns, of an adult female, and of a younger animal.

The male agrees in most particulars with the account of the *Cervus pseudaxis* of Eydoux, figured by Gervais in the 'Voyage of the Bonite,' and its horns with those of the same animal figured by Dr. Pucheran in the 'Archives du Muséum' (vol. iv. t. 24. f. 2-8). The specimens having been procured in the winter, agree with the figures of the animal in that state on M. Gervais's plate.

Mr. Swinhoe thought it might be the *Cervus wallichii* of Cuvier, but it has no affinity to that species.

It is very like a series of animals (for now we have two pairs, and they are breeding) which were received a short time ago by the Zoological Society from Japan, and which I described, under the name of *Rusa japonica*, in the 'Annals and Magazine of Natural History' for February 1861, p. 143; and in the form of the horns and in the general appearance of the animal it agrees with the *Cervus sika*, Temminck, very shortly described and figured in the 'Fauna Japonica.'

Dr. Selater, in the 'Proceedings of the Zoological Society,' has stated his opinion that my *Rusa japonica* is probably the same as *Cervus sika* and also as *Cervus pseudaxis*. But *Cervus pseudaxis* and *Rusa japonica* differ from *Cervus sika* in having a large white anal disk surrounded by a black edge, which is not represented in the figure of *Cervus sika*, nor mentioned in the short and, I own, very imperfect description of that species.

I may state that *Cervus pseudaxis* appears to be a species of the genus *Rusa* rather than *Axis*, with which I had placed it in the 'Catalogue of the Ungulated Animals in the British Museum,' p. 215; and it seems closely allied to the small species which inhabit the islands of the Indian Ocean, that form the second section of the genus *Rusa* in the catalogue above quoted; but, as in the other species of that section, we want much more materials in order to know what are and what are not species of that group.

The animal which has been figured under the name of *Cervus pseudaxis* was obtained by MM. Eydoux and Souleyet in Java, but they did not believe that it was a native of that country. It lived several years in the Jardin des Plantes at Paris, and hence a series of its horns was procured and figured; and while there it bred with the Common Axis, and the male produce was fertile (see 'Archives du Muséum,' iv. p. 421). Some naturalists have given



W. Wolf, del. et lith.

CERVUS PSEUDAXIS. (?)

M & N Hanhart Imp.



the Sooloo Islands, near the Philippines, as the habitat of this specimen, but I do not know on what authority.

The Chinese animal seems also to be much more spotted in the winter season than its Japanese ally (*Rusa japonica*), which nearly lost its spots in the Zoological Gardens during the winter of last year.

The old male is furnished with a kind of mane—that is to say, the hair of the neck is longer and more rigid than that of the rest of the body, except just over the tail, where it is also elongated and rigid. The fur of all the three specimens is long and very close, much more so than in its Japanese ally. The male is rather paler in colour and less spotted than either of the hornless specimens; it has only an indistinct, rather darker line of rather longer hair between the withers, and it has a large blackish space of rigid, rather longer hair over the base of the tail. On the other hand, both the hornless skins have a distinct, well-marked black dorsal streak, which is wider, more distinct, and formed of longer hair on the back of the neck; and they have only a broad, well-marked black edge on the upper surface and side of the white anal disk. The tail in all the specimens is white, with a black streak along the middle of the upper side of the base. In this respect it also agrees with *R. japonica*.

I believe that Dr. Sclater is now satisfied that the identity of my *Rusa japonica* with *Cervus sika* is very doubtful. Indeed, I cannot conceive how this can be otherwise, unless the *Cervus sika* is very badly figured and incorrectly described. We may therefore regard *Cervus sika* as a distinct species, at least until we can procure some further observations on it. It was figured and described from a single male specimen sent to Leyden.

The specimens from Northern China sent by Mr. Swinhoe (which I am inclined to think may be *Cervus pseudaxis* of Eydoux) chiefly differ from *Rusa japonica* in being of a considerably larger size, the Chinese species being as large as the Fallow Deer, and the Japanese *Rusa* considerably less—between that animal and the Roebuck.

I may state that the distinctions of the species of Stags are very difficult to describe by words; yet the allied Deer from different countries are generally to be best distinguished by their size and habitat; and that may be the case with this and the other small *Rusæ* which are described as coming from Timor, the Philippines, and Formosa.

The two skulls which accompanied the skins present a considerable difference in the form and depth of the preorbital pit: and this observation is of some importance, as the size, form, and depth of this pit has been considered by some zoologists as presenting a good specific distinction; but I have observed a similar difference in skulls of apparently the same species of the genus *Cariacus*. The skulls are not of the same age; but I do not think that this can have any effect on the form or depth of the pit. The skull of the male is of a young animal, the hinder grinder being in the course of development; and the horns are simple, without any snags, like the horn figured in 'Arch. du Mus.' vi. t. 24. f. 2, but even wanting the basal snag, and they are covered with hair. In this skull the preorbital

pit is large, subtrigonal, and not quite so deep as it is wide, rounded at the base.

The skull of the female is rather larger, and belongs to an adult animal, with all the grinders well developed. In this skull the pit is oblong, not so broad as long, and very much deeper (I should say, nearly twice as deep), and has a large aperture at the hinder part of its base, evidently for the transmission of some vessel, which is not to be seen in the skull of the male.

The male skull has short canines, not produced beyond the surface of the bone; the female has the holes of smaller canines which have fallen out.

P.S.—Dr. Schlegel, the Director of the Leyden Museum, has, in reply to an application from me, sent me this day (July 11, 1861) the following note on the specimen of *C. sika* in the Leyden collection:—"If you mean by the anal disk the whitish or yellowish disk which extends in the Common or Canada Stag above the tail, the Japanese Stag decidedly shows nothing of this kind. In this species the white colour is restrained to the abdomen, the inside of the thighs, the anal region, and the greater end part of the tail; the root of the tail is, on the contrary, of the same brown colour as the whole back and the rest of the animal."

It is probable, therefore, that the Japanese Deer described by me as *Rusa japonica* may be the same as the *Cervus sika*, though it differs so much from the figure and short description of that animal in the 'Fauna Japonica.'

## 2. ON THE HABITS OF THE PIPE-FISH AND OTHER FISHES.

By DR. J. E. GRAY, F.R.S., V.P.Z.S., ETC.

In examining the tanks in the Zoological Gardens, I was struck with the habits of the Pipe-fish, and induced to take a few notes. There are three species now exhibited there.

They swim with facility, but not very rapidly, and they seem to move chiefly by the action of the dorsal and pectoral fins. The former is fully expanded when they move and in very rapid motion, the action being a kind of wave, commencing at the front end and continued through its whole length, continually repeated, so as to form a kind of screw propeller. The tail seems to be used rather as a foot than as an organ of propulsion; and the specimen that is furnished with a rayed tail expands the rays when it uses this part, giving the end of the tail the appearance of a webbed foot.

They remain in a quiescent state in different positions, sometimes horizontal, at others pendent, but generally more or less ascending from the place on which the tail rests; sometimes even nearly in a perpendicular position, merely resting on the tip of the tail: at these times the fins are generally at rest.

I saw one specimen of the Serpent Pipe-fish with a simple acute tail, which was resting in an erect perpendicular position with the tail

loosely curled round some shells of a *Purpura* that were attached to the surface of the glass of the tank.

This is an approach to the prehensile tail of the *Hippocampi*, but still very different from the habit of that genus.

Mr. Bartlett informs me that, whatever may be the colour of some of the fishes, such as Flounders, Plaice, Soles, and Thornbacks, when placed in the tank, they soon modify their colours so as to be very like that of the shell or sand which forms the ground of the tank; and as shells and shell-sand are now generally used to make the ground of the tank, the fish become of a pale-brown, more or less mottled colour.

The flat fish, as Flounders, Plaice, and Soles, lie tranquilly at the bottom of the tank, on the sand, with their eyes prominent, and their mouth usually rather exerted and partly open; but they swim with facility, bending the side (or, rather, what in other fishes we should call the dorsal and ventral edges) down, so as to raise the central line of the body, and propel themselves with their tails. The pectoral fins seem to be but little used, and they are often very rudimentary; the ventral fins, which are also small when present, are usually expanded when the fish lies on the sand.

It is much to be regretted that persons who have the leisure and opportunity of observing these and other fishes in tanks, do not give us more particulars of their manners, and especially of the means by which they propel themselves through the water, which is evidently very different in the various families and genera. The elongate, cylindrical or subcompressed, or many-angled *Syngnathus* is generally straight and stiff while moving from place to place; while the elongated, rather compressed Blennies, as *Gurñellus* and *Zoarces*, propel themselves forward with a horizontal, serpentine motion, apparently keeping their bodies erect by the dorsal fin and the expanded pectorals.

There is one circumstance connected with the fishes in these tanks which I have never been able to understand; that is their apparent blindness to any external object that is presented to them from the outside of the tank, when it is offered to them on a level with their eyes or apparent range of vision. I have attempted to disturb them with my hand, with a red handkerchief, and with many other bodies; but I have never observed them show the slightest idea of there being any danger, or even take the slightest notice of the approaching body; yet they are easily disturbed if the object is so presented to them as to appear to descend towards them.

### 3. NOTE ON THE LERNÆA CYCLOPTERINA OCCURRING IN THE GILLS OF THE CYCLOPTERINUS SPINOSUS, A FISH FROM GREENLAND. BY W. BAIRD, M.D., F.L.S., ETC.

In the 'Fauna Groenlandica,' O. Fabricius shortly describes a species of *Lernæa* as occurring in the *Cyclopterinus spinosus*. Krøyer in his 'Tidskrift' figures the same parasite; but his figure varies so

much from a specimen lately added to the collection of the British Museum, that I think it advisable to give a short account of it.

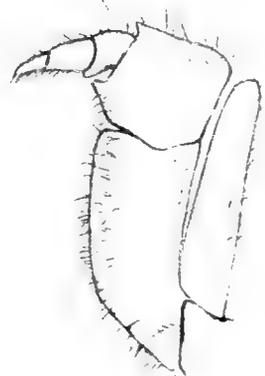
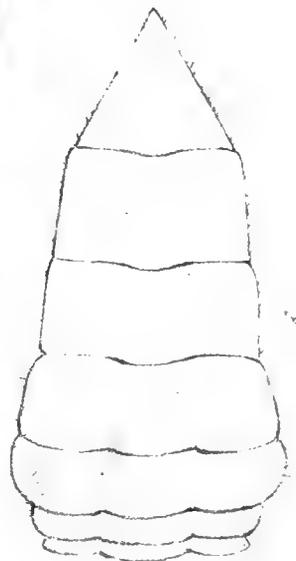
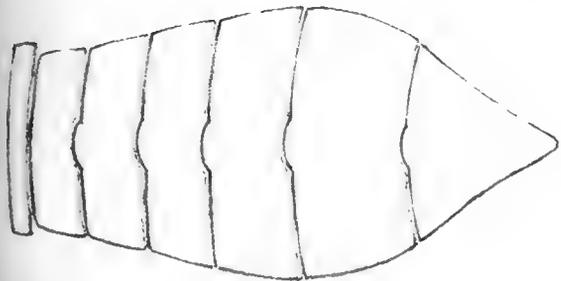
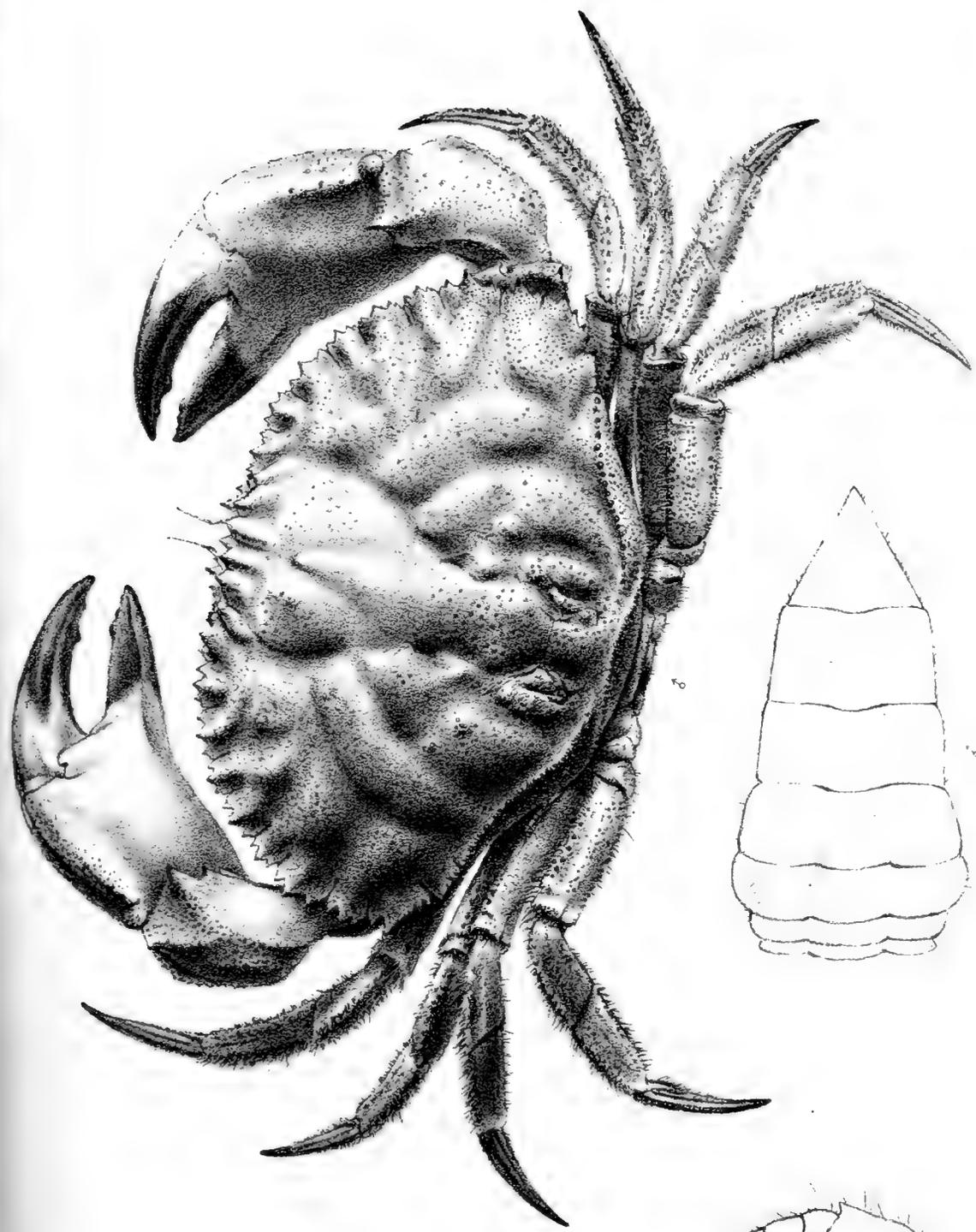
Kröyer mentions that the specimens from which he has figured the species are young individuals; and to this, in all probability, is owing the discrepancy between his figure and the specimen in the possession of the Museum, which evidently is an adult. The neck agrees pretty well with his figure, but the head in our specimen is strongly tubercled. The body is somewhat thin and elongated in Kröyer's figure. In the Museum specimen it is shorter and much thicker, and at the bend of the body from which the ovaries are sent off, there are on each side two strong tubercles. Kröyer does not figure the ovaries; it is evident, therefore, that the specimens in his possession, and from which his figures were made, are immature. The ovarian tubes, as seen in the Museum specimen, are beautifully coiled in a spiral, are strong, and marked with small bands of a brown colour. M. Milne-Edwards, in mentioning this species, says that Kröyer does not figure the cephalic horns which distinguish the genus *Lernæa*; and he suspects that this is only owing to a mutilation of the individual observed by that naturalist. It is curious that I have not been able to discover the cephalic horns in our specimen either; but upon a close examination there is to be seen a rupture of the parts to which, if they existed, these horns would have been attached. In all probability they have been torn away when the specimen was dissected from the fish.

#### 4. DESCRIPTION OF A NEW SPECIES OF CANCER OBTAINED AT MADEIRA. BY JAMES YATE JOHNSON.

(Plate XXVIII.)

##### CANCER BELLIANUS, sp. n.

Carapace of a pale brown, suffused and spotted with red; its surface rough, with small tubercles, and strongly marked with the regional divisions; transversely oblong, with the middle portion moderately elevated. Latero-anterior margin divided into ten quadrate lobes, alternately broad and narrow; the outer edge of each lobe armed with three teeth, of which the middle one is larger. On the broader lobes the lateral teeth are frequently bifid. The hindmost lobe on each side has only one principal tooth, but there are three or four small ones. This lobe passes into the posterior marginal line of the carapace, and this line is beaded with a series of tubercles. The front of the carapace has two dotted lobes or flattened teeth, with a narrow triangular tooth projecting between and beyond them. The superior margins of the ocular orbits are denticulated, and have a strong triangular tooth over the inner canthus, which does not project quite so far as the two principal lobes of the interocular front. The margin between the two superior fissures is denticulated, but has no predominating tooth. Inferior margin of the ocular orbit armed with three teeth, of which the innermost is large and stout. The external





antennæ have their basal joints much elongated, and terminating forwards in an obtuse tooth. The second joint is club-shaped, and the third cylindrical. The anterior half of the internal antennæ is folded directly backwards when at rest.

The sternum is minutely punctated, and its entire surface in the male is set with longish stiff hairs; in the female the hairs are chiefly confined to the posterior portion.

Feet.—First pair subequal, stout, and longer in the male than in the female. Fingers black, marked with longitudinal furrows, and having two or three large tubercles near the extremity of their prehensile edges. Upper surface of hand marked with seven low longitudinal crests or rows of tubercles, some of which bear minute spines; and in the female with a good deal of stiffish hair; under surface minutely punctated. The wrist has the superior surface studded with three or four rows of short sharp spines with broad bases. The inner inferior edge has two stout black spines, the strongest of which is near the anterior extremity of the joint. The arm bears two sharp spines on its upper edge near the anterior extremity, and these are separated by a deep transverse furrow which crosses each of the adjacent surfaces. Remaining feet slightly compressed, irregularly angular, marked with longitudinal spinous crests, and clothed with long stiff hairs. The last joint is remarkably long, spineless, but marked with deep longitudinal grooves, in some of which is a dense line of hair. The terminating spine is reddish. The order of length of the feet in the male is 1, 3, (2, 4), 5.

Abdomen.—The third segment is the broadest in the male, the sixth in the female. In both, the sides of the seventh segment are somewhat sinuated. In the female the margins of the abdomen are thickly fringed with hair, and the surface also bears a good deal of shorter stiff hair.

The measurements of two specimens, a male and female, are subjoined, the figures signifying inches.

	Male.	Female.
Carapace : Length.....	$4\frac{3}{8}$	$4\frac{3}{16}$
Breadth .....	7	$6\frac{3}{16}$
Feet : First pair—Length.....	7	5
Width of hand.....	2	0
Third pair .....	$6\frac{3}{8}$	5
Abdomen : Total length .....	3	$3\frac{2}{3}$
Width of third segment....	$1\frac{5}{16}$	
Width of sixth segment....		$1\frac{7}{8}$

This species will take its place in the neighbourhood of *Cancer plebeius*, Poeppig, a Chilian species, from which, however, it is distinguished by the stoutness of the first pair of feet, the less prominence of the tubercular spines on the hand, the greater prominence of the middle tooth of the lobes at the margin of the carapace, the greater abundance of hair, the absence of the scroll of white spots which paint each side of the upper surface of the carapace in *Cancer plebeius*, and the much greater unevenness of the carapace, arising from the deeper cutting of the divisions between the regions.

Only two specimens of this Crab have fallen in my way. One is in the British Museum, and the other is in my own collection at Madeira. To both were attached numbers of the rare cirripede *Pæcilasma crassum*, Darwin. I have named it in honour of that learned carcinologist, the President of the Linnæan Society, and the author of a memoir on the genus *Cancer*, printed amongst the Transactions of that body.

#### 5. DESCRIPTION OF A NEW LEDA. BY SYLVANUS HANLEY.

**LEDA DOHRNI.** *Testa oblongo-acuta, vix inæquilateralis, convexa, cute pallide straminea induta, antice sublævigata, postice et in medio costata; costis planulatis; interstitiis angustis, lævibus. Extremitas antica anguste rotundata: latus posticum gradatim acutangulare. Plicæ umbonalis situs ordinarius angulatim et repente depressus. Margo dorsalis utrinque modice declivis, antice convexus, postice subrectus; ventralis subarcuatus, utrinque (sed antice præsertim) acclivis. Area dorsalis antica vix impressa, subconcentrice sulcata; postica satis magna, impressa, subconcentrice costellata. Nates acutæ, vix elevatæ. Umbones lævigati.*

*Hab.* Mare Pacificum.

*Mus.* Dohrn.

The anterior side, which, if either, is the shorter, is smooth, or, at most, obsoletely grooved, and is marked with a radiating shallow indentation, that is chiefly perceptible near the ventral edge. The surface is rather glossy: the ribs become subimbricated near the hinder dorsal area. The posterior dorsal slope is straightish, or subretuse (except in the middle): the hinge-margin is broad; and the teeth numerous on both sides of the small cartilage-pit.

#### 6. DESCRIPTIONS OF NEW SPECIES OF MOLLUSCA FROM THE PACIFIC ISLANDS. BY W. HARPER PEASE.

##### PINNA TRIGONALIS.

Shell light, of an elongate triangular shape, slightly curved, basal margin squarely truncate; valves elevated at their centre, forming a ridge extending nearly the whole length of the shell, and slightly contracted at the centre of the basal margin. Beaks ribbed and striated transversely, striæ raised, fine and rather distant, ribs extending down on the posterior margins the whole length of the shell. Horn-colour, darkest at the beak, shading off into white towards the basal margin.

*Hab.* Kingsmill Islands.

##### HELIX ACETABULUM.

Shell small, planorboid, slightly convex above, or plane; umbilicus wide, cup-shaped, finely radiately striated above and below, carinately

ribbed at the periphery and on the margin of the umbilicus, beneath more or less obsoletely ribbed; whorls six, carinately rounded, and ornamented with radiating lines of short hairs, sutures well impressed; aperture subrhomboidal, a single lamella on the penultimate whorl. Tessellated with dark chestnut and fulvous brown.

Diam. 5 mill., length of axis 2 mill.

*Hab.* Tahiti.

In size, colour, and general shape this species agrees with *H. obolus*, Gould. It may prove to be a variety. It is never, however, concave above, and is more or less ribbed beneath. The epidermic lines, supporting short hairs, are common to most of the species of this type, so far as I have observed, on our islands and from the south. They are easily rubbed off, and seldom appear, except on living specimens.

#### HELIX PARVIDENS.

Shell small, discoidal, slightly convex above, rounded beneath, ornamented with fine, regular, crowded, raised striæ; whorls five, rounded, sutures well impressed; aperture lunate, and usually furnished with six lamellæ, two on ultimate whorl, one on pillar, and three on penultimate whorl; umbilicus deep, about one-fourth of the width of the shell. Tessellated with reddish brown and light fulvous.

*Hab.* Tahiti.

#### HELIX CONULA.

Shell light, thin, imperforate, conoidal, convex beneath; whorls five, convexly rounded, the last carinate at its periphery, sutures well impressed, the upper whorls ornamented with rather distant, revolving, rib striæ, which become obsolete on last whorl, base finely radiately striated; aperture triangularly lunate; columella thickened, tortuous, and slightly reflected at its base, forming a tooth-like process. Colour light yellowish.

Diam. 7 mill., height 5 mill.

*Hab.* Tahiti.

#### CYCLOSTOMA TAHITENSIS.

Shell pyramidal, imperforate, vitreous, of a reddish horn-colour; ribbed longitudinally, ribs irregular, in number over twenty, prominent, interstices concave, very finely striated lengthwise; whorls six, rounded, and separated by a profound suture; aperture angularly oval; lip white, continuous, separate or connected for a short distance with the penultimate whorl.

Length 7 mill., breadth  $3\frac{1}{2}$  mill.

Animal pale; tentacles slightly dusky, stout, tapering (not clavate), eyes on their outer posterior bases; muzzle prominent; foot small, oblong-oval, not grooved longitudinally, consequently locomotion is effected in the same manner as in the *Helices*.

*Hab.* On the ground in dry woods, Huaheine.

#### CYCLOSTOMA VIRIDESCENS.

Shell small, conic, cylindrical, of a light greenish colour; whorls

six, convexly rounded, sutures well impressed; aperture lunately oval; lip entire, white, attached for a short distance to the penultimate whorl.

*Hab.* Huaheine.

This species is apparently covered with an epidermic layer, of a greenish colour. But one specimen found in company with the preceding.

The only species I am aware of allied to it is *C. ventricosa*, Hom. & Jac., Voy. au Pôle Sud, from which it differs in shape and colour.

#### FISSURELLA GRANIFERA.

Shell conical, slightly ovate, inclined anteriorly, radiately granosely ribbed; interstices cancellated; orifice oblong, slightly excavated in the middle. Colour white, rayed with light green.

*Hab.* Sandwich Islands.

#### PLANAXIS PLUMBEA.

Shell solid, oblong-ovate, minutely striated transversely; bluish lead-colour, surrounded with black and whitish bands, usually on the lower half of the whorls, upper part with one or two obscure black bands, the margins of the whorls tinged with reddish brown; whorls six, convex, the last more than two-thirds the length of the shell; aperture ovate, expanded; columella curved; epidermis brown, velvety.

*Hab.* Sandwich Islands.

#### COLUMBELLA SANDWICHENSIS.

Shell short, thick, smooth, white, mottled with orange colour, and ornamented with rather distant transverse orange-brown lines; spire short, granulose at apex; last whorl faintly striated at base; columella slightly curved, with two prominent teeth on the inner, and six smaller on its outer edge.

*Hab.* Sandwich Islands.

This species seems to approach varieties of *C. turturina*.

#### MELAMPUS (TRALIA) STRIATUS.

Shell elongately ovate, dark brown; spire short; apex granulose; last whorl ornamented with revolving striæ, which, on mature specimens, are distant or disappear altogether on the middle portion of the whorl; columella furnished with three plaits and one at the base; outer lip with one or two lamellæ.

*Hab.* Tahiti.

#### DORIOPSIS VIRIDIS.

Animal small, somewhat rigid; form oblong-oval, widest at the middle, rounded at both ends; mantle convex, covering the foot, thin at the margins, minutely granulose; cervical tentacles small, ovate, mucronate, laminated, and retractile into large simple cavities; labial tentacles wanting; foot small, similar to mantle in shape;

branchial plumes small, not reaching the edge of the mantle, and retractile into a semicircular cavity; plumules ten, pinnate, middle ones largest. Colour dark green, foot pale or yellowish, cervical tentacles and branchial plumes slate-colour, dorsal papillæ sometimes tipped with white.

*Hab.* Under loose coral on reef, Tahiti.

The above species agrees in its generic characters with the first described by me, from the Sandwich Islands, and confirms the genus as then established.

#### PLEUROBRANCHUS DELICATUS.

Animal small, delicate, subpellucid, uniform orange-yellow throughout, the viscera imparting a dark shade to the dorsal region; mantle smooth, oblong-oval, truncate in front, rounded behind, convex along the dorsal region; foot elongate-oval, rounded at both ends, entirely concealed by the mantle.

Shell small, elongate-oval; nucleus subspiral, exhibiting distinct lines of growth; pale horn-colour, tinged with violet, subpellucid.

#### PLEUROBRANCHUS — ?

Animal cream-colour; mantle reticulated with opaque white, and irregularly maculated with reddish brown; the larger spots more or less dotted with white; under edge of the mantle and margin of foot dotted with reddish brown, and a larger spot of the same colour on the upper posterior end of the foot.

Form oval; anterior portion of mantle concave, smooth, subpellucid, with the exception of the white reticulations, which appear slightly elevated; foot thin, oblong, projecting behind the mantle when the animal is in motion.

#### CRYPTOPHTHALMUS CYLINDRICUS.

Animal elongate, smooth, subcylindrical, sides nearly parallel; cephalic disk about one-fourth of the entire length of the animal, depressed, subcaudate, convexly truncate in front, and furnished posteriorly with two small, appressed, triangular lobes; eyes beneath the cephalic disk inconspicuous from above, but can be seen distinctly by turning up the edges of the disk; the lateral lobes closely envelop the body, extending from the head to the excretory tube, the left one overlapping the right; excretory tube at the posterior end of the body, short, convolute. Colour dusky olive, the margins of the cephalic disk paler than centrally, and the locomotive disk paler than above.

*Hab.* Tahiti, on sea-weed.

#### DOLABRIFERA TAHITENSIS.

Animal subpyriform, elongate, widest posteriorly, rounded behind, margins thin; dorsal region furnished with scattered, minute, sub-retractile simple and branchial filaments; head rounded above, convex in front; eyes immersed, a little in advance of the dorsal tentacles, the pupil bluish black, and iris bluish slate; dorsal tentacles

strongly dilated outwards, ear-shaped, obliquely truncate and grooved; anterior of about the same size, rather more dilated; the whole upper surface is beautifully variegated with different shades of white, green, olive brown, and sometimes blotched with rusty brown; locomotive disk pale greenish grey, closely and finely dotted with opaque white and pale olive.

*Hab.* Tahiti. Quite common under stones in littoral zone. Their motion is vivacious. They glide along by the middle and two lateral portions of the foot alternately.

This species approaches *D. olivacea* of the Sandwich Islands.

#### LOBIGER — ?

Animal elongate; the tail, margins of the foot, tentacles and centre of natatory appendages beneath papillose; anterior portion of the body covered with a large Bulla-shaped shell, which is perforated at the apex for the passage of water or excrement, and covered with a thin greenish membrane; tail long, arched, gradually tapering; tentacles four, auriform, subconvolute, somewhat dilated and truncated; eyes immersed behind the dorsal pair; natatory appendages thin, oblong, elongate, anterior pair somewhat less than the whole length of the animal, posterior a little shorter than the anterior, widest at their outer halves, and their sides deeply incised, giving them a leaf-like appearance; locomotive disk like *Aplysia*. Colour pale pea-green, tips of the tentacles tinged with yellow, a dusky marginal band along the edge of the body; the upper surface of the natatory lobes are greenish centrally, fading into yellowish pink towards the margins, which are white; the lower surface is of the same colour, but brighter, and the margins dusky.

Station, among sea-weed on sandy bottom, in sheltered places. When disturbed, they cast off all their lobes, which retain their vitality for several hours.

The above species I place provisionally under this genus until more fully examined. It differs, however, in the shape of its shell, and the number and shape of its tentacles.

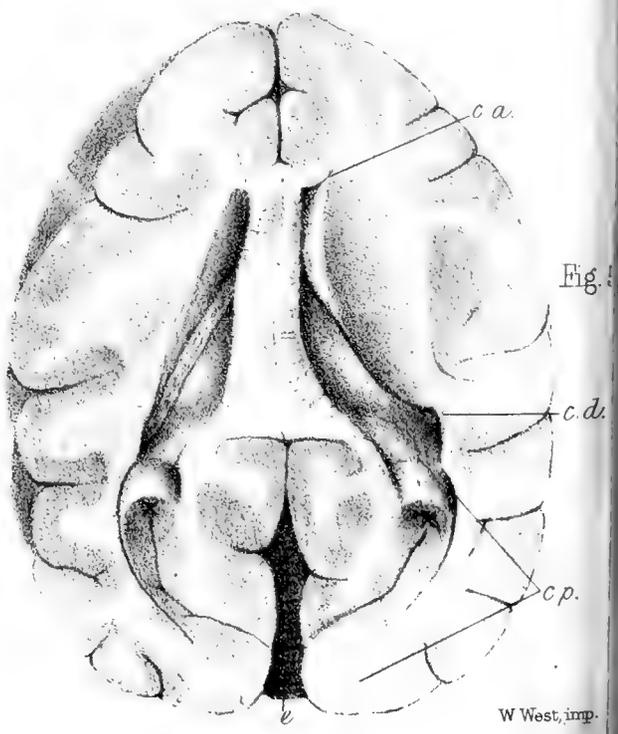
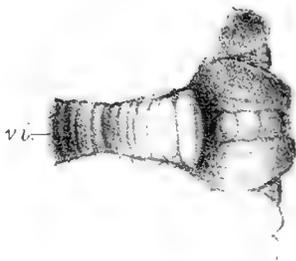
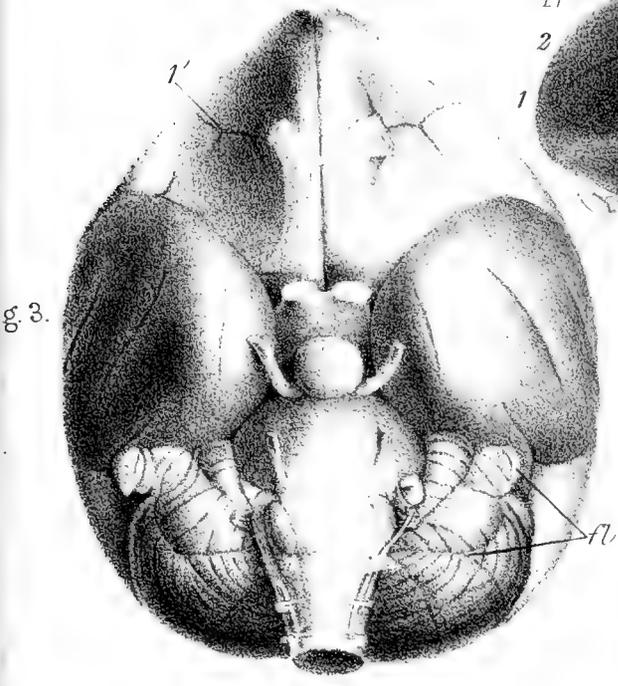
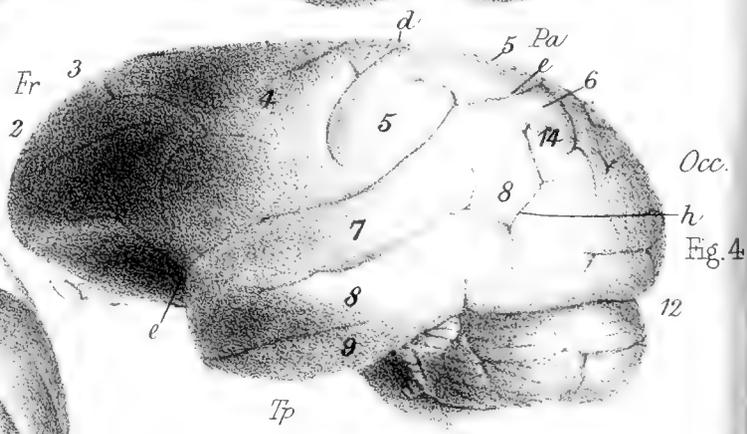
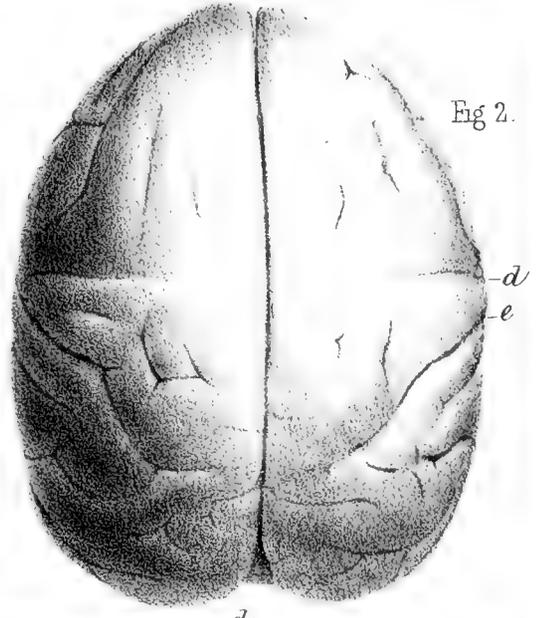
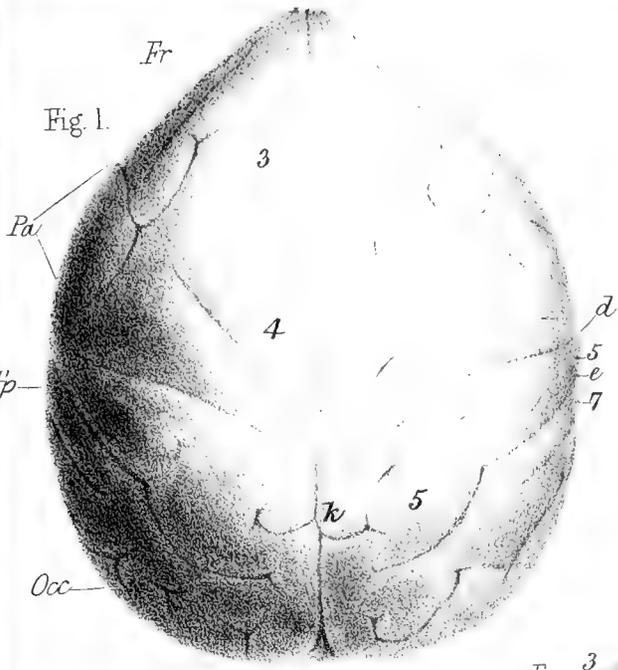
#### LOPHOCERCUS VIRIDIS.

Body oval or ovate; dorsal region elevated; tentacles well developed, grooved and truncated; eyes immersed immediately behind the tentacles; lateral lobes regular in shape, outline of the edges convex, not meeting; foot linear, adapted for clasping sea-weed; the whole upper surface garnished with more or less numerous, cirriferous appendages. Colour grass-green, mottled with darker; some are minutely dotted with brown, others with a few blue dots, margined with black rings along the edge of the lateral lobes and on the neck.

Shell thin, fragile, white, ovate, striated obliquely, convolute; outer lip separate from the apex, overlaps the inner posteriorly, and produced in a tubular form.

Station, on sandy bottom, among sea-weed, in shallow water. When handled, it discharges a white viscid fluid.





G. West.

Fig. 7.

W West, imp.

Brain of *Ateles paniscus*.

## DORIS PULCHRA.

Animal soft, oblong-elongate, obtusely rounded in front, and acutely behind; dorsal region convexly rounded; margins thin and depressed, slightly undulated, behind the tentacles slightly contracted; branchiæ small, suberect, eight or nine in number, smaller posteriorly; plumule linear, tapering to a point, subquadrangular, compressed, the compressed sides finely and closely lamellated, united at base, and retractile into a common simple cavity; vent-tube suberect and prominent; dorsal tentacles rather large, oblong ovate, finely and closely obliquely lamellated, and retractile into simple cavities; labial appendages small, cylindrically tapering; foot long, narrow, projecting considerably beyond the mantle, acutely rounded behind, and obtusely in front. Colour white, reticulated with orange-yellow and violet-brown lines; mantle edged with violet, upper half of tentacles violet, branchial plumes edged with violet; colour beneath the mantle same as above; upper surface of the foot has a submarginal irregular orange band. The colour of the reticulations on the mantle varies.

7. ON THE BRAIN OF ATELES PANISCUS. BY THOMAS H. HUXLEY, F.R.S., V.P.Z.S., PROFESSOR OF NATURAL HISTORY IN THE GOVERNMENT SCHOOL OF MINES.

(Plate XXIX.)

The brain of a Spider Monkey (*Ateles belzebuth*) has already been partially described and figured by M. Gratiolet in his remarkable memoir 'Sur les Plis Cérébraux des *Primatès*' (1854); but this careful observer had only old spirit specimens at his disposal, and it did not enter into his plan to give any account, either of the internal structure of the cerebrum, or of its relations to the cerebellum, or of the cerebellum itself. Hence a new description, which should touch upon these points, could hardly be superfluous, under any circumstances; while, at the present moment, the controversy which has arisen respecting the nature and the extent of the differences in cerebral structure between Man and the Apes gives an especial value to all new facts.

It has been affirmed—and a proposed new classification of the Mammalia has been largely based upon the assertion—that the brain of Man is distinguished from that of all Apes by possessing a posterior lobe, a posterior cornu to the lateral ventricle, and a hippocampus minor—these structures being absent in all Apes, even the highest\*.

I have elsewhere† exposed the fallacy of these distinctions as applied to the Apes in general; Dr. A. T. Thomson‡ and Dr. Rolleston§ have proved the existence of the three structures referred to in the Chimpanzee and the Orang, by investigations upon the brains

\* Prof. Owen "On the Classification, &c. of the Class Mammalia," Proc. of Linnean Society, 1857; Reade's Lecture, 1859; Athenæum, March 23, 1861.

† Natural History Review, No. 1, January 1861; Athenæum, April 13th, 1861.

‡ Nat. Hist. Review, No. 1, January 1861.

§ Nat. Hist. Review, No. 2, 1861.

of these animals, undertaken with especial reference to the questions under discussion; and I propose to continue the process of rectification thus commenced, by inquiring into another special case—that of *Ateles paniscus*—and proving, by direct demonstration of the facts, that the three structures, said to be absent even in the highest Apes, are, on the contrary, largely developed\* in this comparatively low American monkey, possessed of but a rudimental thumb upon its hand, and provided with four more teeth than the Old World Apes and Man.

In fact, so far from its being true that the differences between Man and the Apes lie mainly in the cerebral characters, so often referred to, all the evidence now accumulated tends towards the belief that the only three, very striking, cerebral characters, absent in other Mammalia, which can be truly affirmed to be common to Man and the Old and New World *Simiæ*, are exactly these three,—the whole of the true Apes, so far as our present knowledge goes, possessing a posterior lobe, a posterior cornu to the lateral ventricle, and a hippocampus minor in that posterior cornu; while these structures, so far from being in a rudimentary condition, are often more largely developed, in proportion to other parts of the brain, in the Apes than in Man.

The figures 1 and 2 of Plate XXIX. represent the brains of a male and of a female *Ateles* of about the same size, as seen from above: both figures were drawn under my own eye by a very competent artist, and are in all essential respects perfectly faithful. It is nevertheless obvious that they differ greatly—so much, in fact, that they might readily be supposed to have belonged to different species. The whole difference, however, is due to the circumstance that, while fig. 1 was drawn from an almost fresh brain, fig. 2 represents a brain which had been for several months in spirit†. The roundness of outline of the latter as compared with the former, and the more transverse direction of the fissure of Rolando, are very remarkable; for the skulls of the two specimens show no particular difference of form. In the unaltered brain, figs. 1, 3, 4, the narrowness of the frontal lobes anteriorly, the excavation of their orbital faces, and the flatness of the superior contour are especially worthy of notice. Viewed from above, no part whatsoever of the cerebellum is visible, either at the sides or behind; while a profile view shows that the cerebral hemispheres projected, for at least  $\frac{1}{10}$ th of an inch, behind the posterior edge of the cerebellum. Whether this represents the total amount of cerebral overlap or not, I cannot say, in the absence

\* Since this paper was read, Mr. Marshall, F.R.S., has published, in the third number of the 'Natural History Review' (July 1861) a valuable essay on the Chimpanzee's brain, illustrated by photographs of the parts said to be absent; and Mr. Flower, in a paper read before the Royal Society (June 20th, 1861), has demonstrated over again the presence of the same parts in the Orang's brain, has shown their large development in *Cebus*, and has even proved the presence of a large posterior cornu and of a hippocampus minor in the Lemurine *Otolincus*!

† The brain of *Ateles belzebuth*, figured by M. Gratiolet, pl. 10. figs. 1, 2, 3, 4, has undergone the same alteration as that represented in my fig. 2, as might be expected from the fact of its having been long preserved in spirit.

of a vertical section of an *Ateles*' skull; but it is amply sufficient to prove that, even accepting as the definition of the posterior lobe the novel formula "All that part of the hemisphere which covers the posterior third of the cerebellum and passes behind it," *Ateles* is provided with a well-developed posterior lobe.

In this respect, as I have already said, it resembles all the Old and New World *Simiæ* which have yet been examined,—the only genus, within my knowledge, which even comes near to presenting an exception being *Mycetes*. I have not, indeed, had the opportunity of dissecting the brain of this monkey (nor has M. Gratiolet been enabled to give any account of it); but the Curator of the Hunterian Museum having kindly permitted me to have a vertical longitudinal section of the skull of a *Mycetes* made, I found not only that the plane of the tentorium (and consequently the inferior margin of the posterior lobes of the cerebrum) had a much greater inclination than in any other Simian (making an angle of as much as  $45^\circ$  with the base of the skull), but that the cerebral overlap, measured in the manner described by me in the 'Athenæum' for April 13th, 1861, does not exceed  $\frac{1}{20}$ th of an inch, though the maximum length of the cranial cavity is 2·4 inches. Notwithstanding this reduction of the posterior lobe, however, the contrast between *Mycetes*, as a true Simian, and a *Lemur* is very striking, especially if both be simultaneously compared with some lower Mammal, such as the Dog. The occipital foramen in *Mycetes* is situated altogether upon the posterior face of the skull, and the condyles look completely backwards, as in the Dog; while the occipital crest is placed as near the postero-superior margin of the skull as in that animal. In both, the posterior face of the skull looks backwards, and not appreciably downwards. But in the Monkey the inclination of the tentorium, large as it is, is far less than in the Dog. The inner face of the occipital bone beneath the tentorium is not excavated, and the cerebral lobes projected beyond the cerebellum when the palate was horizontal. In the Dog, on the contrary, the internal surface of the occipital bone below the tentorium is much excavated; and, when the palate was horizontal, the posterior edge of the cerebellum must have projected far beyond the cerebral lobes.

In *Lemur catta* the inclination of the tentorial plane is hardly greater than in *Mycetes*; but if the palatal line be made horizontal, it will be found that the posterior boundary of the cerebellar chamber projects for  $\frac{1}{5}$ th of an inch beyond that for the cerebrum, although the greatest length of the cranial cavity is only 1·9 inch. In fact, the cerebral hemispheres of the Lemur have a less backward development than those of the Dog. I believe that all the Lemurs are in the same case, and that the *Prosimiæ* are sharply defined from the *Simiæ* by the fact of always having more or less of their cerebellum uncovered; so that, by this character alone, the Lemurine brain is far more widely separated from that of any Simian, than the latter is from the human brain.

While one American Monkey (*Mycetes*) is, if the development of its posterior lobes only be taken into account, at the bottom of the

series of *Simiæ*, if the same character alone be considered, another Simian, inhabiting the same geographical area, is at the top; I refer to *Chrysothrix sciureus*, whose posterior lobes, as I. G. St.-Hilaire long ago proved\*, are better developed than those of any other Mammal, overlapping the cerebellum by one-fifth of their length. In fact, if the *Primates* were arranged according to the development of their posterior cerebral lobes, we should have some such descending series as the following:—*Chrysothrix*, *Cebus*, *Troglodytes*, Man, . . . . *Mycetes*—a series which sufficiently illustrates the classificatory value of these structures. So much for the posterior lobe. I turn now to the next point, the demonstration of the existence of the posterior cornu in *Ateles*.

When the lateral ventricle was exposed in the ordinary way (Pl. XXIX. fig. 5), a straight line passing from the extremity of the anterior to that of the posterior cornu measured 2·1 inches. A distance of 1·3 inch separated the anterior end of the anterior cornu from the commencement of the descending cornu; while a straight line extending from the commencement of the descending to the end of the posterior cornu measured 0·75. Each lateral ventricle, measured from the centre of the corpus callosum to the outer boundary, at its widest point, or opposite the commencement of the descending cornu, was about half an inch wide. The posterior cornu has a general direction backwards, outwards, and then inwards; and, besides its general curvature, it has a secondary inflexion, so as to be a little sinuous. It is wide at its commencement, but rapidly narrows, until, where it bends inwards, its walls are so close together as to give it the appearance of a mere fissure, whose sides are apt to adhere together in such a manner as seriously to interfere with the satisfactory definition of the posterior limits of the cornu. In preparing the specimen, of which fig. 5 is a representation, for the artist, I therefore took care not to extend these limits artificially, rather preferring to leave a portion of the cornu unopened, than to exaggerate its length.

In the other brain I found the posterior cornu, on the right side (dissected in the ordinary manner), to be traceable, without the least difficulty, to within a very short distance of the posterior limit of the hemisphere; while in the left hemisphere, which I examined by making successive vertical sections from behind forwards, the posterior cornu ended at fully a quarter of an inch distance from the posterior extremity of the hemisphere. Such sections are of particular value; for they show the extent of the cornu without any disturbance of its natural dimensions; and a comparison of the woodcuts (fig. 1) A, B, C, &c., and A', B', C', &c., which represent two series of sections of corresponding regions of the Human and the *Ateles*' brain, will at once show that the relative dimensions of the posterior cornu are greater in the Monkey than in Man. I may remark that, of the left hemispheres of three human brains which I have dissected for comparison with *Ateles*, that whose sections are represented in the figures had its posterior cornu far better developed than the other

\* See the 'Zoologie du Voyage de la Vénus' for an excellent figure of this brain.

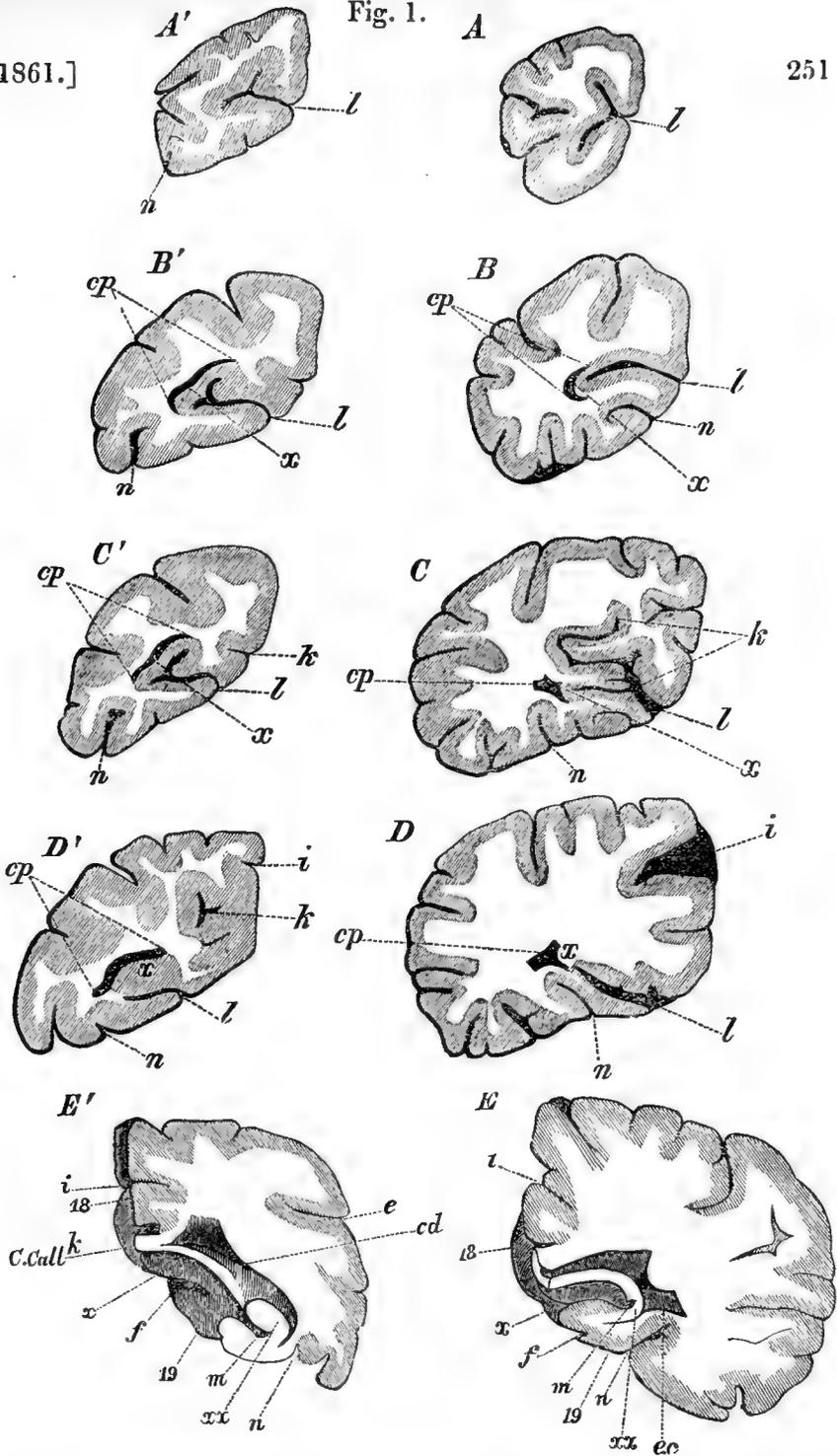


Fig. 1.—Transverse sections of corresponding (left) cerebral hemispheres of Man (A, B, C, D, E) and of *Ateles* (A', B', C', D', E'), taken perpendicularly to the plane of the corpus callosum, along the lines marked with corresponding letters in Fig. 2. *l*. calcarine sulcus; *n*. collateral sulcus; *i*. callosomarginal, *k*. occipitoparietal sulcus; *c. p.* posterior cornu; *x*. hippocampus minor; *xx*. hippocampus major. A-D, A'-D' viewed from behind; E and E' from in front.

two, in one of which the cornu was a mere fissure, while in the other it was excessively short, not extending for more than half an inch behind the corpus callosum.

Thus, not only does the posterior cornu of the lateral ventricle exist in *Ateles*; not only has it that backward, outward, and then inward curvature which has been wrongfully asserted to be peculiar to the homologous cavity in the human brain; but it is, in proportion, wider than in the human brain, and it is longer than in many human brains.

The third point in my argument is the demonstration of the existence of the hippocampus minor. But such strange confusion has been lately introduced into anatomical science, partly by a misapplication of well-understood terminology, and partly, to all appearance, by a want of proper acquaintance with the structure and nomenclature of the human brain, that I must begin *ab initio*, by a description of the latter, so far as regards the hippocampi and their related structures.

The term "Hippocampus minor" was first used by Vicq d'Azyr in the following passage of his famous 'Traité d'Anatomie et de Physiologie' (tome i. 1786), where, in the Explication des Planches du Cerveau, pl. 6. p. 9, I find:—"26. 46. 45. Saillie ou relief qui se continue en 26 avec l'origine de la corne d'Ammon, et qui en 45 se recourbe en dedans: c'est la partie que Morand a appelée l'ergot\*."

The term "hippocampus minor" has been used in the sense here defined by Vicq d'Azyr by all succeeding anatomists, as the following extract from the celebrated work on Human Anatomy, "Soemmering, vom Baue des menschlichen Körpers," Bd. IV. (Hirn- und Nervenlehre, umgearbeitet von G. Valentin) pp. 195, 196, will show:—"Der Sporn, oder die Klaue, oder der Vogelsporn, oder die Vogelklaue, oder der kleine Fuss des Seepferdes, oder der Nagel, oder der Stiefel, oder die Falte, oder der Hahnensporn, oder die hintere, oder kleinere, Wulst, oder die fingerförmige Erhabenheit (*calcar s. unguis, s. calcar avis, s. hippocampus minor, s. pes hippocampi minor, s. eminentia minor, s. digitata, s. unciformis, s. ocrea, s. colliculus*), bildet eine nach aussen und vorn convex gebogene Erhabenheit der inneren Wand des hinteren Hornes des Seitenventrikels."

"The hippocampus minor forms an elevation, convex outwards and forwards, of the inner wall of the posterior cornu of the lateral ventricle."

There can, therefore, be no doubt as to what is meant by the term 'hippocampus minor.'

Another elevation of the wall of the ventricle is known to human

\* "Ce relief est, comme la corne d'Ammon, ou hypocampe, formé d'une lame blanche à sa surface, et, plus profondément, de substance grise: il occupe l'angle interne du prolongement postérieur des ventricles latéraux, comme l'hypocampe celui du prolongement inférieur des mêmes cavités; et il ne diffère de cette production qu'en ce qu'il se termine par une pointe mousse, tandis que l'autre s'élargit en s'éloignant de son origine. On peut donc le regarder comme un petit hypocampe, et le désigner sous le nom de hippocampus minor par opposition avec l'hypocampus major, qui est la corne d'Ammon. Cette nomenclature m'a paru plus convenable que celle d'unguis, de colliculus, &c."

anatomists as the 'Eminentia collateralis,' for an authoritative definition of which I will again quote Soemmering's Anatomy, "Die seitliche Erhabenheit oder die längliche Seitenerhabenheit oder die Nebenerhabenheit (*eminentia lateralis, s. collateralis, s. Meckelii*), bildet eine wulstige Hervorragung welche vor dem Eingange in das hintere und neben dem in das untere Horn des Seitenventrikels liegt, und nach aussen von dem Ammonshorne sich befindet. Uebrigens wird diese Benennung offenbar auf verschiedene, variable, grossere oder unbedeutendere, Erhabenheiten, die neben dem Ammonshorne, in dem Bereiche des unteren Hornes des Seitenventrikels vorkommen, angewendet."

"The eminentia lateralis, or collateralis, or Meckelii, is formed by a rounded elevation which lies in front of the entrance into the posterior, and beside that into the inferior cornu of the lateral ventricle, and is situated external to the cornu Ammonis."

It will be observed that Valentin, who has taken great care to collect together the multitudinous synonyms of the parts of the brain, does not enumerate "pes hippocampi minoris" among those of the eminentia collateralis; nor has the term 'pes hippocampi minoris' been ever used in this sense by any anthropotomist of authority.

And if it be an error in terminology to apply the name of pes 'hippocampi minoris' to the eminentia collateralis, it is a still greater error, in point of anatomical fact, to assert that "the eminence continued backwards from the pes into the posterior cornu is the hippocampus minor\*." If any eminence is continued backwards from the eminentia collateralis into the posterior cornu (as sometimes happens) it lies in the floor of the cornu, alongside the hippocampus minor, but perfectly distinct from it. But it will perhaps be better to demonstrate this elementary fact over again, though I feel that the doing so necessitates an apology to those who are conversant with the anatomy of the human brain †.

The lower figure of the woodcut (fig. 2) represents the inner surface of one of the hemispheres of the human brain. The contour is taken from one of Foville's Plates, but only the principal sulci are indicated,—those marked *l*, *m*, and *n* being put in from a specimen which I dissected, so as to ascertain their true nature. Of these sulci, that marked *i i* is the sulcus called by Gratiolet 'fronto-parietal,' a name which involves an ambiguity, and for which I therefore propose to substitute 'calloso-marginal,' as this sulcus lies between the corpus callosum and the margin of the hemisphere; *k* is the occipito-parietal sulcus (scissure perpendiculaire interne, *Gratiolet*); *l* is the posterior part of the "scissure des hippocampes" of Gratiolet. This sulcus is a very remarkable one. Commencing just in front of

\* Prof. Owen, Athenæum, March 23rd, 1861.

† Compare, for example, the well-known standard English 'Elements of Anatomy,' by Quain and Sharpey, where the relations of the eminentia collateralis and hippocampus minor to distinct convolutions are clearly pointed out (p. 710). Malacarne (*Encefalotomia Nuova*, 1780, part ii. p. 67) describes the continuation of the eminentia collateralis forwards into the descending cornu under the fanciful name of "Gamberuolo," or greave. It appears to be more constantly of large size than the continuation backward into the posterior cornu.

the posterior thickening of the corpus callosum, opposite *x*, it rapidly deepens as it is traced backwards, and forms a great fissure, extending, in some parts, for as much as  $\frac{3}{4}$  of an inch upwards and outwards, and passing backwards until it nearly reaches the posterior margin of the hemisphere, where it terminates by dividing into two short, but deep, branches, a superior and an inferior. Traced from before back-

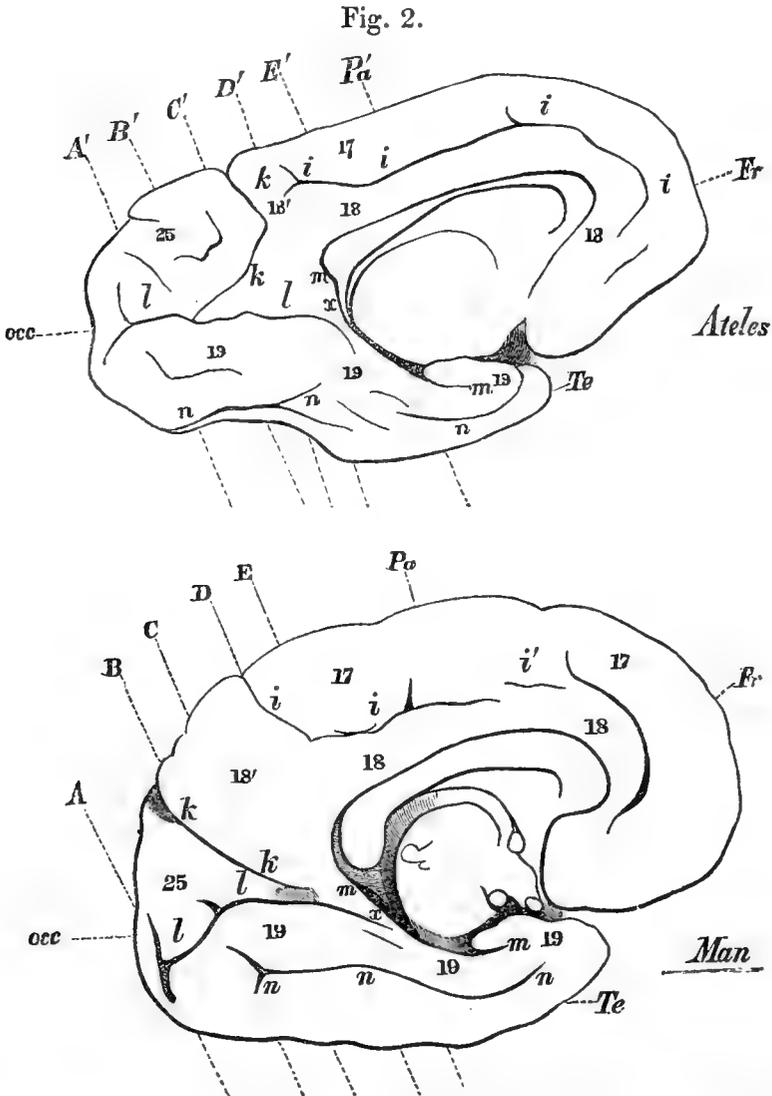


Fig. 2.—View of the inner surface of the left cerebral hemisphere of *Ateles*, of the natural size, and beneath it a corresponding view of the human left cerebral hemisphere reduced to the same size. In the latter only the principal sulci are indicated. *i*. calloso-marginal sulcus; *k*. occipito-parietal sulcus; *l*. calcarine sulcus; *i*. dentate sulcus; *m*. collateral sulcus; *x*. continuation of the callosal gyrus (18) into the uncinatè gyrus (19). *A*, *B*, *C*, &c., *A'*, *B'*, *C'*, &c., the lines along which the transverse sections in Fig. 1 are taken.

wards, or from within outwards, the line of this sulcus presents a strongly marked, but irregular, upward convexity.

On making successive transverse sections of this cerebrum from before backwards (woodcut, fig. 1. A, B, C, D), the fissure was seen, in its most posterior part (A), to pass almost horizontally outwards for a short distance, and then to divide into an upward and a downward branch. In front of A it forms a curve strongly convex upwards, without any terminal bifurcation; in B it is much longer and less convex; in C it is but slightly sinuous, and in D it is a little concave upwards and inwards. Combining these views with those given in fig. 2, it is easy to form an estimate of the figure of the surfaces of the upper and under lips of the sulcus; but what is most important about it is, that, so far as the posterior cornu extends, the closed end of this sulcus corresponds with the hippocampus minor (*x*), which last is, in truth, nothing but the arch of cerebral substance which, at once, forms the outer boundary of the sulcus and the inner boundary of the cornu.

From its special relation to the hippocampus minor, or "calcar avis," I shall call this the "calcarine" sulcus; but it extends beyond the calcar and the posterior cornu, both anteriorly and posteriorly, particularly in the latter direction. Nevertheless it does, in a definite sense, correspond with the inner wall of the posterior cornu. The calcarine sulcus dies away anteriorly, at the point indicated, and is in no way continuous with that sulcus which has a relation to the hippocampus major similar to that of the calcarine sulcus to the hippocampus minor, and which, for distinction's sake, I will call the 'dentate' sulcus, on account of its relation to the fascia dentata or *corps godronné*. This narrow and well-known sulcus lies between the letters *m* and *m*, the lower *m* being placed opposite its termination in the fold formed by the recurved part (crochet de l'hippocampe, *Gratiolet*) of the so-called 'uncinate' convolution (19). Thus the dentate sulcus, which corresponds with the hippocampus major, is separated from the calcarine sulcus, which similarly answers to the hippocampus minor, by the rounded process of cerebral matter, *x*, this last being, in fact, the inferior and posterior continuation of the callosal gyrus (circonvolution de l'ourlet of Foville, pli du corps calleux of *Gratiolet*). This continuation of the callosal gyrus into the uncinate gyrus is regarded as an anomalous peculiarity of the human brain by M. *Gratiolet* (*l. c.* p. 64); but, so far as I have examined into the matter, it is similarly continued into the uncinate gyrus in Apes.

Ending at a point considerably anterior to the calcarine sulcus, sometimes in a bifurcated extremity, there is another deep sulcus, *n, n*, which runs, at first, roughly parallel with *l, l*, but is much longer, being continued along the inner and under surface of the temporal lobe nearly to its extremity. Although not so deep as the calcarine sulcus, it is continued upwards and outwards, for a considerable distance; and throughout its whole course, the bottom, or roof, of the sulcus underlies the floors of the descending and posterior cornua. If a vertical section be taken through the eminentia collateralis (*E*, p. 251), it will be found that the arch of cerebral substance, *e c*, whose convex side receives that name, by its concave side bounds the sulcus in

question: in other words, the eminentia collateralis stands in the same relation to *nn* as the hippocampus minor to *ll*, or the hippocampus major to *mm*. From the region especially named by anatomists "eminentia collateralis," the sulcus *n, n*, which may be conveniently termed the 'collateral' sulcus, is continued forwards and backwards, and preserves, as might be expected, a similar relation to the parts which are the continuation of the eminentia collateralis, viz. the floors of the descending and posterior cornua respectively, as it had to that eminence. It is difficult to imagine a much more definite proof, if any were wanted, that the hippocampus minor is in no sense a continuation of the eminentia collateralis.

In the brain whence the sections A to E were taken, the floors of both the descending and the posterior cornua were particularly broad (C, D); but even here the posterior cornu became a mere crescentic slit posteriorly (B). However, the continuation of the collateral sulcus was always directed upwards and outwards towards the bottom of the slit\*.

A comparison of the views here given, of the inner face and of sections, of Man's brain, with, as nearly as possible, corresponding views of the brain of *Ateles* (woodcuts, figs. 1 and 2) is exceedingly instructive. The principal sulci alone exist in *Ateles*; so that its brain furnishes a sort of sketch map of Man's. The calloso-marginal sulcus, *i, i*, is easily recognizable; so is the occipito-parietal sulcus, *k, k*; though the latter, instead of being straight and forming an obtuse angle with the plane of the corpus callosum, as in Man, is strongly convex forwards†, and, on the whole, makes an acute angle with the same plane. As a consequence, the occipital lobe (*occ*) is much larger, proportionally, than in Man, while the quadrate lobule is *pari passu* smaller. The calcarine sulcus, *l, l*, has the same general direction and the same bifurcated termination, as in Man. Anteriorly, it ends just in front of the level of the posterior edge of the corpus callosum (the prominent uncinatè gyrus must be pushed aside to see its termination); and it is, as in Man, separated from the dentate sulcus by the narrow prolongation of the callosal gyrus downwards into the temporal lobe, *x*. Lastly, the collateral sulcus, *n n n*, is traceable—though interrupted at intervals—through the same extent, as in Man; and of the three parts into which it is broken, the posterior is continued back even further than in him, and passes a little on to the outer and posterior face of the hemisphere. The greater

\* I have recently had the opportunity of dissecting ten human brains, and, in all, I have found the calcarine and collateral sulci to present the relations described above, with perfect constancy. On the other hand, nothing could be more variable than the length and form of the posterior cornu of the lateral ventricle, and the relative and absolute size of the hippocampus minor. In one of these brains—that of a negro—the posterior cornua were almost absent, not exceeding one-third of an inch in length, on either side. In another the cornua were both  $1\frac{1}{4}$  inch long and very wide, with a large hippocampus. Another had a posterior cornu  $\frac{1}{2}$  an inch long on the left side, 1 inch on the right. In yet another it was much longer on the right than on the left side, &c.

† I found this in both brains. M. Gratiolet represents the corresponding sulcus in *A. belzebuth* as nearly straight.

proportional width of the uncinate gyrus, contained between the calcarine and dentate sulci above, and the collateral sulcus below, is marked in *Ateles*. The transverse sections (fig. 1. A', B', &c.) are no less strictly comparable to those yielded by the human brain, the chief differences being that, throughout the greater part of its length, the calcarine sulcus possesses the bifurcated outer extremity which its posterior part only presents in Man; and that the collateral sulcus is smaller and further out in proportion, and hence the uncinate gyrus is larger.

As to the hippocampus minor, the transverse sections (fig. 1) clearly show how much larger it is, proportionally, in *Ateles* than in Man; while the horizontal section (Pl. XXIX. fig. 5) exhibits its exact correspondence with the definition quoted above—viz. “an elevation of the inner wall of the posterior cornu of the lateral ventricle, which is convex outwards and forwards;” and, as might be expected from the transverse section, it shows the larger proportional size and greater outward convexity of the Monkey's hippocampus minor.

The eminentia collateralis, on the other hand, is far less developed in *Ateles* than in the particular human brain whence the sections are taken; but it is quite distinctly visible at the junction of the posterior and descending cornua. The floors of both these cornua, however, are so narrow, that the eminentia can hardly be said to be continued into them, as it sometimes is into the posterior cornu, and almost always is into the descending cornu, in the human brain. Thus, in exact contradiction of what has been affirmed, it is the hippocampus minor which is developed, and the continuation of the eminentia collateralis backwards which is *not* developed in the Monkey.

The sulci and gyri of the outer surface of the cerebral hemispheres present in *Ateles paniscus* the same essential arrangement as in the *Ateles belzebuth*, described and figured by M. Gratiolet. Dividing the hemisphere into five lobes (frontal, parietal, median, temporal and occipital) the median (insula—Island of Reil) hidden between the lips of the Sylvian fissure, is a mere smooth convex projection, wider above than below, or having somewhat the shape of a triangle, with its apex downwards and forwards, and wholly devoid of sulci. The small frontal lobe is divided by the horizontal sulci into the three infero-frontal, medio-frontal, and supero-frontal gyri. The antero-parietal sulcus is placed very far forward, at the commencement of the Sylvian fissure, joins the supero-frontal sulcus, and then sends a branch backwards. The postero-parietal sulcus (scissure de Rolando) is situated so far back that the antero-parietal gyrus (1<sup>r</sup> pli ascendant, Gratiolet) is exceedingly thick, and it passes backwards, as well as upwards, towards the inner and upper margin of the hemisphere, close to which it terminates. The postero-parietal gyrus (2<sup>e</sup> pli ascendant) widens superiorly, in consequence of the backward inclination of the upper part of the Sylvian fissure, to form the postero-parietal lobule (lobule du deuxième pli ascendant), which

presents one or two minor sulci upon its surface, and has its inner edge notched by the upper end of the calloso-marginal sulcus. The temporal lobe, again, is plainly divided into the usual antero-temporal, medio-temporal, and postero-temporal gyri, and the occipital lobe has a horizontal sulcus which marks off an infer-occipital gyrus from an upper region representing the super- and medi-occipital gyri. In both brains I find a distinct occipito-temporal sulcus (*scissure perpendiculaire externe*), though M. Gratiolet states that this very Simian fissure is obliterated in *Ateles* (*l. c. p. 76*). However, he figures what I cannot but consider to be this sulcus in his pl. 10. f. 2.

Another point on which I am much inclined to differ from M. Gratiolet is that which he himself regards as a difficulty—viz. the extent of the fissure of Sylvius. I cannot find the “*pli intermédiaire, très petit il est vrai,*” which he supposes (*l. c. p. 75*) to bound the upper extremity of the Sylvian fissure. On the contrary, it appears to me to be one continuous sulcus; and admitting this to be the case, it will not be longer than the Sylvian fissure of the *Douroucouli* (Gratiolet, pl. 11. figs. 10, 11). But if this be the fact, then 6, fig. 4, will be the angular gyrus (*pli courbe*) and 14, fig. 4, will be the second annectent gyrus (*deuxième pli de passage*).

This interpretation, again, would diverge from that given by M. Gratiolet; but I must confess that, to me, the least satisfactory part of this able observer's treatise is that which relates to the identification of the angular gyrus and the annectent gyri, throughout the series of the *Primates*.

The transverse diameter of the cerebellum (Pl. XXIX. figs. 4, 6, 7) is much larger, in proportion to its antero-posterior measurement, than in Man, and the sides of the upper surface slope more away from the vermis superior. The anterior and posterior notches are almost obliterated, the posterior extremity of the vermis extending very nearly as far back as the level of the posterior edges of the cerebellar hemispheres. The transverse diameter of the vermis is much greater, in proportion to the whole diameter of the cerebellum, than in Man, and the vermis inferior presents no such sharp distinction into pyramid, uvula, &c., as in the human subject. The great horizontal fissure is distinct and tolerably deep; but I could discover no definite minor fissures, and consequently no demarcation of the upper, or under, surfaces of the hemispheres into lobuli. There are not even any distinct lobules, as amygdala, beside the uvula. On the other hand, the flocculi are enormous, and end in prominent rounded processes, which fit into deep fossæ upon the inner surfaces of the petrosal bones.

A distinct posterior medullary velum was visible on each side, connecting the nodule with the flocculus; and the valve of Vieussens, as usual, united the processus e cerebello ad testes. The arbor vitæ was well-marked and complex in its branchings, in a vertical median section of the cerebellum.

Of the corpora quadrigemina the nates are smaller than the testes; but the brachia superiora are larger than the brachia inferiora, on

which latter the corpus geniculatum internum looks almost like a ganglion.

The pons is large and convex, but nevertheless leaves tolerably well-defined corpora trapezoidea upon the surface of the sides of the medulla oblongata, which last exhibits distinct oval olivary bodies. The pituitary body, very large and spheroidal, is connected with a prominent infundibulum, which is separated by a slight transverse notch from the single corpus mammillare.

The commissures, third ventricle, pineal gland, &c., presented nothing remarkable. The nerves are large in proportion to the brain, particularly the olfactory nerves (which are very broad and flat), the optic nerves, and the oculo-motor nerves; but beyond their large size, they differ in no striking respect from the corresponding parts in Man.

#### EXPLANATION OF PLATE XXIX.

(All the figures are of the natural size.)

- Fig. 1. Brain of *Ateles paniscus* (female), almost fresh, viewed from above.  
 Fig. 2. Brain of a male *Ateles*, preserved in spirit and altered in form.  
 Fig. 3. Under view of the female brain. The cerebellum has fallen back by its own weight beyond the posterior edges of the cerebral hemispheres. *fl.* flocculus.  
 Fig. 4. Side view of fig. 1.  
 Fig. 5. The same brain dissected, to show the lateral ventricles and their cornua. *ca*, anterior; *cd*, descending; *cp*, posterior cornu; \* hippocampus minor. On the right side, the distance between the extremities of the diverging lines indicates the whole length of the cornu on one side, in the female brain.  
 Fig. 6. The cerebellum viewed from above; *vs*, vermis superior.  
 Fig. 7. The cerebellum viewed from below; *vi*, vermis inferior.

#### NOMENCLATURE AND LETTERING OF ALL THE FIGURES.

Cerebrum :

Lobes: frontal lobe, *Fr*; parietal, *Pa*; median, *M*; temporal, *Te*; occipital, *Occ*.

Gyri (of the outer face) :

1. Infero-frontal (étage surcilier).
  2. Medio-frontal (étage frontal moyen).
  3. Supero-frontal (étage frontal supérieur).
  - 1'. Supra-orbital (plis orbitaires).
  4. Antero-parietal (premier pli ascendant).
  5. Postero-parietal (deuxième pli ascendant).
  - 5'. Postero-parietal lobule (lobule du deuxième pli ascendant).
  6. Angular (pli courbe).
  7. Antero-temporal (pli temporal supérieur).
  8. Medio-temporal (pli temporal moyen).
  9. Postero-temporal (pli temporal inférieur).
  10. Super-occipital (pli occipital supérieur).
  11. Medio-occipital (pli occipital moyen).
  12. Infero-occipital (pli occipital inférieur).
  13. First external annectent
  14. Second external annectent
  15. Third external annectent
  16. Fourth external annectent
- } (plis de passage externes).

## Gyri (of the inner face):

- 17. Marginal (pli de la zone externe).
- 18. Callosal (circonvolution de l'ourlet, Foville) (pli du corps calleux).
- 18'. Quadrante lobule (lobule quadrilatère, Foville).
- 19. Uncinate (circonvolution à crochet, V. d'Azyr) (lobule de l'hippocampe).
- 20. Dentate (corps godronné).
- 21—24. Internal annectent (plis de passage internes).
- 25. Internal occipital lobule (lobule occipital).

## Sulci (of the outer face):

- a. Infero-frontal.
- b. Supero-frontal.
- c. Antero-parietal.
- d. Postero-parietal (scissure de Rolando, Leuret).
- e. Sylvian.
- f. Antero-temporal (scissure parallèle).
- g. Postero-temporal.
- h. Temporo-occipital (scissure perpendiculaire externe).

## Sulci (of the inner face):

- i. Calloso-marginal (grand sillon du lobe fronto-parietal).
- k. Occipito-parietal (scissure perpendiculaire interne).
- l. Calcarine (posterior part of the scissure des hippocampes).
- m. Dentate.
- n. Collateral.

ca, cd, cp, anterior, descending, and posterior cornua of the lateral ventricles.

\* hippocampus minor; \*\* hippocampus major.

ec, eminentia collateralis, or its continuation.

[The synonyms given above are taken from the work of M. Gratiolet when no other anatomist's name is attached to them.]

8. ON THE ISLAND-HEN OF TRISTAN D'ACUNHA. BY PHILIP LUTLEY SCLATER, M.A., Ph.D., F.R.S., SECRETARY TO THE SOCIETY.

(Plate XXX.)

The fact of the existence of a bird of the family *Rallidæ*, with imperfectly developed wings, in the Island of Tristan d'Acunha has already been recorded by more than one writer\*. One of the objects most interesting to naturalists in the fine collection of living animals lately received by the Society from His Excellency Sir George Grey, to which I especially called the attention of the Society at their last meeting †, was a single example of this bird—the first of its kind that has reached Europe alive or dead. It appears to belong to a new species of the genus *Gallinula*, closely allied in general aspect to our Common Water-hen (*G. chloropus*), though readily distinguishable on accurate comparison.

Five living examples of this bird were brought from the Island of Tristan d'Acunha to Cape Town by a person formerly in the service of Sir George Grey. Two of them were accidentally killed at Cape Town, but their skins, except the heads, were preserved by Mr. Benstead,

\* See Mr. J. H. Gurney in *Zoologist*, p. 4017 (1853), and Capt. Carmichael in *Linnean Trans.* xii. p. 496.

† See *antea*, pp. 208, 209.





and are now before the Meeting. Of the three that were shipped for England for the Society, two died on board, but their bodies were placed in spirits and brought to England. Fortunately the remaining individual reached our Gardens in safety, and may now be seen in excellent health and condition in the large Aviary.

The name "Island-hen" given to this bird by the inhabitants of Tristan d'Acunha has suggested to me the specific term *nesiotis* ( $\nu\eta\sigma\iota\omega\tau\iota\varsigma$ , *insularis*), under which I propose to characterize this species as

GALLINULA NESIOTIS. (Pl. XXX.)

*Capite et collo undique cum corpore subtus saturate nigris: dorso toto, alis extus, tectricibus caudæ superioribus et hypochondriis brunnescenti-olivaceis: crisso nigro, tectricibus subcaudalibus pure albis circumdato: striis lateralibus, sicut in G. chloropode, albis; campterio alari et remigis primi margine externo albidis: rostro et clypeo frontali coccineis, illius apice flavo: pedibus flavicantibus.*

Long. tota 9·0, alæ 5·5, caudæ 3·3; rostri a rictu 1·25, tarsi 1·9, digiti med. cum ungue 2·7.

*Hab.* In Ins. Tristan d'Acunha.

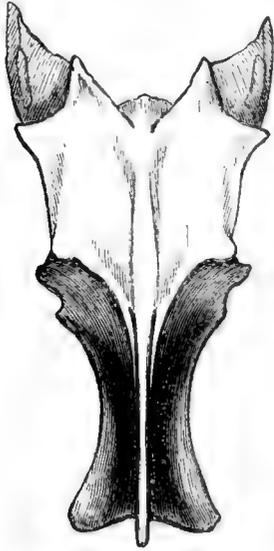
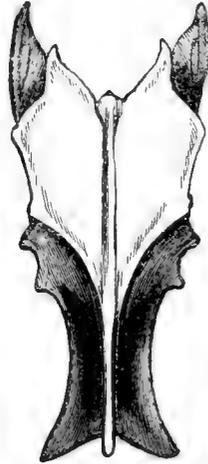
*Obs.* Sp., quoad colores, *G. chloropodi* haud dissimilis, sed capite et ventre valde obscurioribus et forma crassiore, alis minoribus et pedibus robustioribus facile nota.

The coloration of this bird is much the same as that of the Common Moor-hen, but generally darker, and the head and body beneath are of a dull black, not ash-coloured. The form of the present species is, however, much shorter and thicker, and the legs generally more stout, though the toes are not longer than in *G. chloropus*. The characteristic red garter, which surrounds the base of the thigh in the Moor-hen, is also partially seen in the new species. On comparing the wings together, we find that of *G. nesiotis* nearly an inch shorter, and the feathers remarkably soft and inferior in size to those of *G. chloropus*. The primaries appear to be all present, but their barbs much less developed, and the stems are likewise much less in size. As far as can be judged from the specimen in our Gardens, the bird can flutter a little, but obviously uses its legs and not its wings as a mode of escape from its enemies.

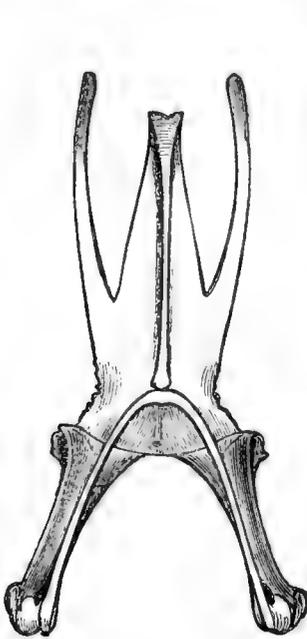
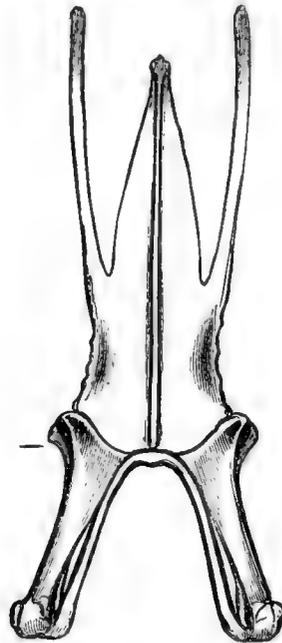
On dissection of one of the examples in spirits, the general appearances of the soft parts coincided with those of the *G. chloropus*. The length of the whole intestine was about 29 inches: two large cæca, of about 3 inches in length, were situated  $2\frac{1}{2}$  inches from the anus; the intestine was of nearly uniform size throughout; the gizzard was large and muscular; the thighs were remarkably large and fleshy.

On comparing the skeleton of *G. nesiotis* with that of *G. chloropus* we find a development of the *femora* and *pelvis* corresponding with the outward appearances and change of habits. The total length of the femur in *G. nesiotis* is nearly four lines greater, and its whole size is larger than that of *G. chloropus*. The difference in

the size of the pelvis is shown by the accompanying outlines (see woodcut), fig. *a* representing the *pelvis* of *G. nesiotis*, and fig. *b* that

Fig. *a*.Fig. *b*.

of *G. chloropus*. There are also conspicuous differences noticeable on comparing the sterna of the two species, as will be visible on

Fig. *c*.Fig. *d*.

examination of figs. *c* and *d*, which give the outlines of this part of the skeleton of *G. nesiotis* and *G. chloropus*. The sternum of

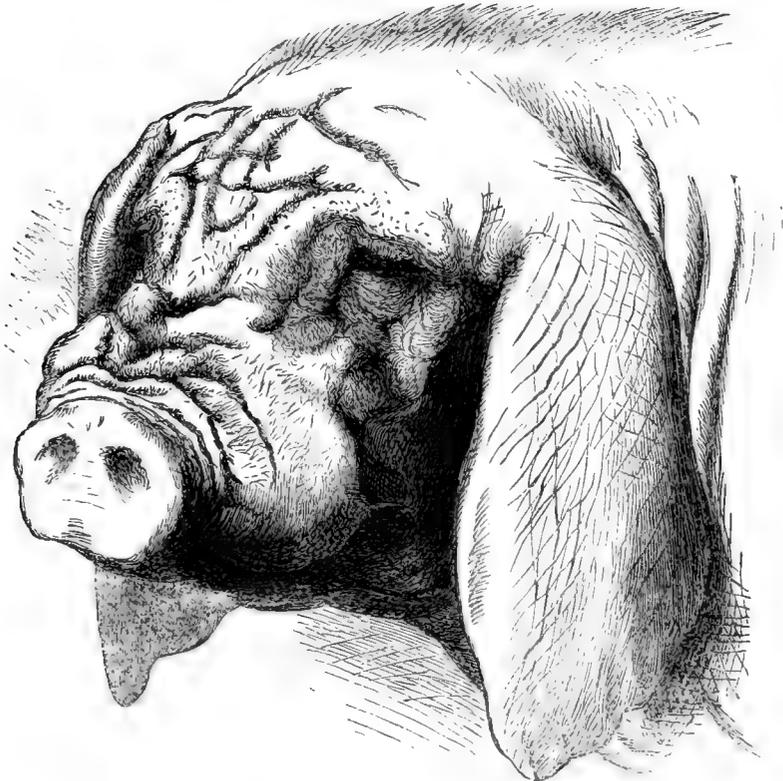
*G. nesiotis* is much shorter, broader, and the keel is not nearly so deep. The following are some of the most important corresponding dimensions of this part of the two birds in inches and decimal parts:—

	<i>G. nesiotis.</i>	<i>G. chloropus.</i>
Length of sternum and coracoids . . . . .	2·45	2·90
Distance between outer ends of coracoids. .	1·35	1·15
Depth of keel . . . . .	0·35	0·55
Length of keel along the base . . . . .	1·50	1·85
Length of keel along the crest . . . . .	1·35	1·95

I may remark, that the only other known land-birds of Tristan d'Acunha are the singular Thrush described by Mr. Gould (P. Z. S. 1855, p 65) as *Nesocichla eremita* and a Bunting referred by Capt. Carmichael to *Emberiza (Sycalis?) brasiliensis*. The latter's *Turdus guianensis* is doubtless intended for *Nesocichla eremita*.

#### 9. REMARKS ON THE JAPANESE MASKED FIG. BY A. D. BARTLETT.

This remarkable animal differs so much from all the varieties of domestic pigs, that I am inclined to believe its origin must have been from some species distinct from our common stock.



The singular form of the head and face (see woodcut), together

with the enormous development of skin, and the regular arrangement of the wrinkles, the large and pendulous ears, the drooping muzzle, together with its intelligent eye, give this animal a dog-like appearance; in fact, the frequency of the remark made by persons seeing these animals for the first time confirms this opinion.

Apart, however, from this, the whole structure of this animal is well worthy of consideration: the sides of the rump, and also from the top of the shoulders downwards, are thick folds of skin, which are much harder on those parts than elsewhere, and hang about in the same position and manner as the plates on the same parts of the Indian Rhinoceros.

Having placed with the male of this animal two or three young sows of the Berkshire breed, I have succeeded in obtaining a mixed race. These half-bred pigs very closely resemble the male, being black with white feet, and exhibit the wrinkles on the face, but in a less degree.

In what way our domestic breed of pigs has been produced it is difficult to imagine. It is, however, very remarkable that in the *Wild Boar of Europe, Africa, and Asia* the young are always striped at birth, and in no instance is this marked character found in any of our domestic breeds; but the colour and markings that appear at birth continue during life unaltered. Not so with the wild species, whose young, although striped at first, gradually lose these markings as they grow to maturity.

The skeleton of this animal has not, at present, been examined. I can say, however, that the form of the skull is strikingly different from that of any of the species of *Sus* that I have seen.

The following list of additions made to the Menagerie during the month of May was read to the Meeting:—

		Presented by
1 Secretary Bird .....	<i>Serpentarius reptilivorus</i>	E. L. Layard, Esq., F.Z.S.
1 Ocelot .....	<i>Felis pardalis</i> .....	W. Duncan Stewart, Esq.
1 Axis Deer .....	<i>Cervus axis</i> .....	Earl Fitzwilliam.
1 Cross-bred Cashmere Goat	<i>Capra hircus</i> , var.....	Earl Fitzwilliam.
1 Ichneumon .....	<i>Herpestes griseus</i> .....	H. K. Dixon, Esq.
1 Pinche Monkey .....	<i>Hapale ædipus</i> .....	M. F. de Paula Mañero.
1 Chinese Sand Grouse .....	<i>Syrhaptus paradoxus</i> ..	Cpt. Commerell, R.N., V.C.
1 Nightingale.....	<i>Luscinia philomela</i> .....	Mr. Mason.
2 Canadian Geese .....	<i>Bernicla canadensis</i> .....	T. N. Hunt, Esq., F.Z.S.
7 Young Kingfishers .....	<i>Alcedo ispida</i> .....	J. C. Cumming, Esq.
1 Common Buzzard .....	<i>Buteo vulgaris</i> .....	W. Broderick, Esq.
1 Zebra .....	<i>Equus burchellii</i> .....	} His Excellency Sir George Grey, F.Z.S.
1 Koodoo .....	<i>Strepsiceros kudu</i> .....	
1 Blesbok .....	<i>Damalis albifrons</i> .....	
1 Grysbok .....	<i>Calotragus melanotis</i> ..	
1 Rehbok .....	<i>Heleotragus capreolus</i> ..	
1 Steinbok .....	<i>Calotragus tragulus</i> .....	
1 Blaubbok .....	<i>Cephalophus pygmaeus</i> ..	
4 Cape Hyrax.....	<i>Hyrax capensis</i> .....	

		Presented by
1	Dasyure .....	<i>Dasyurus maugæi</i> .....
1	Pigtailed Monkey .....	<i>Macacus nemestrinus</i> ...
1	Wattled Crane .....	<i>Grus carunculata</i> .....
2	Stanley Cranes .....	<i>Tetrapteryx paradisea</i> ...
1	Island Hen .....	<i>Gallinula nesiotis</i> .....
		His Excellency Sir George Grey, F.Z.S.
	<i>Coronella cana</i> .....	
	<i>Leptodeira rufescens</i> .....	
	<i>Psammophis sibilans</i> .....	
	<i>Boodon lineatus</i> .....	
8	South African Snakes... }	<i>Lamprophis aurora</i> .....
		<i>Bucephalus capensis</i> .....
		<i>Naia haje</i> .....
2	Chameleons.....	<i>Chamæleo dilepis</i> .....
1	Chinese Kite .....	<i>Milvus govinda</i> .....
13	Chinese Golden Fish ...	<i>Cyprinus auratus</i> , var....
1	Collared Peccary.....	<i>Dicotyles torquatus</i> .....
1	Slow-paced Lemur.....	<i>Stenops javanicus</i> .....
3	Wheatears .....	<i>Saxicola ænanthe</i> .....
1	Indian Civet Cat.....	<i>Viverricula indica</i> .....
		Capt. G. C. Bird.
		Capt. G. C. Bird.
		Capt. Pope.
		W. Duncan Stewart, Esq.
		Purchased.

Of these, *Strepsiceros kudu*, *Damalis albifrons*, *Calotragus tragulus*, *C. melanotis*, *Gallinula nesiotis*, *Coronella cana*, *Leptodeira rufescens*, *Psammophis sibilans*, *Boodon lineatus*, *Lamprophis aurora*, *Bucephalus capensis*, and *Chamæleo dilepis*, were stated to be exhibited in the Society's collection for the first time.

June 25th, 1861.

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

The Secretary read an extract from a letter from Dr. Shortt, F.Z.S., dated Chingleput, May 10th, 1861:—

“By the present mail I send you the head and skin of a Snake common to this place; the natives call it ‘Cathree Pamboo’ (Scissors Snake). This name it gets on account of the double fangs, as you will see from the specimen I send. The snakes are large; one I killed the other day measured 4 feet 6 inches in length, and was 7½ inches in circumference at its thickest part; it is prettily marked, and is considered extremely poisonous and deadly. These snakes are common in prickly pear (*Cactus opuntia*) hedges, sometimes are found about gardens and rocks; they live on rats, mice, birds, frogs, &c.; the natives are in great dread of them. I find that they are very delicate, from being so easily killed; the slightest blow kills them. To suspend them with a noose attached to some part of the body for a couple of minutes kills them. I have been trying to get a live specimen, but in consequence of their deadly poisonous nature and the terror with which a native looks on them, and from their delicacy in being so readily killed, I have not succeeded. Three have been brought me, but they were either dead or dying ere they reached me.

“I am inclined to believe that this is ‘*Vipera russellii*’ of E. W. Gray; but, if so, it is not known by the same native name here as he gives to it. Russell, I think, calls it ‘Runniadi vyrien’ (opening-glass); but not seeing the double fang noticed in any work I have consulted, and finding the same to exist in three snakes that were brought to me, I take the liberty of sending this specimen, and should be glad to have your opinion upon the matter.”

The Secretary stated that the skin of the snake in question was referred by Dr. Günther to *Daboia elegans*—a well-known Indian and Ceylonese species. The double fangs were produced by the new pair coming forward before the old pair were completely shed, and were, therefore, only exceptionally present.

The following extract was read from a letter, dated Sydney, April 19th, addressed by Dr. G. Bennett, F.Z.S., to the Secretary:—

“You will recollect I mentioned in my ‘Gatherings’ a specimen of the Semipalmated Goose (*Anseranas melanoleuca*). That bird I found on my return to Sydney alive and well, and it has been presented to me by its owner Mr. Clarke. In the young bird the legs and mandibles were flesh-colour; in the adult they are of a light reddish-orange colour, except the horny tip of the mandibles, which were of a light-blue colour. The black and white plumage—the former colour predominating—imparts to the bird a very handsome appearance as it walks with a stately tread (not with the waddling gait of the goose) about the yard of my house like one of the Waders. I have, however, from ignorance of its natural habits been the probable cause of the death of this bird, and I send you the following remarks, considering they may be of some service to those desirous of domesticating them. This bird was reared from the egg hatched under a common hen, and has survived nearly four years and a half domesticated in daily amicable intercourse with ducks, geese, and all kinds of poultry, and always appearing playful and happy in their society. But it unfortunately happened that, when sent to me, I was not aware of its aversion to a solitary life. When alone in the yard I noticed that it did not eat. Fearing that it had not his usual food, I made inquiry, but found that it had its accustomed food. Still, however, it moped, and more frequently than usual made its peculiar clanging noise; and although he would walk about the yard, yet he more frequently mounted the high flight of stone steps and squatted upon the lofty wall, remaining there for the most part of the day. Although it did not feed well, yet it would often wash itself in a tub of water placed for its use, and drank a good deal of water. At last it became ragged in plumage, the wings drooped, and it died after having been in my possession only from the 28th of February to the 25th of March. On mentioning the circumstance to a relation of the donor, I was then informed, but too late, that if kept by itself it would droop and refuse food; but when placed among other fowls became lively, playful, and fed well. I fear that many birds and other animals perish in our menageries by inattention to these apparently trivial circumstances, which are, however, most essential to

their successful rearing and preservation. I have been informed by those who have eaten of these birds in the southern parts of Australia that they are usually thin, and the flesh coarse and not well-flavoured."

The following letter was read, addressed to the Secretary by Capt. J. H. Speke :—

"H. B. M. Consulate, Zanzibar,  
22nd September, 1860.

"SIR,—I have the honour to inform you that I have this day packed and left at this house two cases of specimens of natural history, which will be forwarded to the Royal Geographical Society, London, through Her Majesty's Secretary of State, as soon as an opportunity offers itself to Her Majesty's Consul. They will probably be forwarded by the next Hamburg vessel that leaves this port.

"1. The specimens are preserved in spirits. All those found in case No. 1 were collected in this island, save one Teal, one Sandpiper, and one Lily-stalker, which were procured at Delagoa Bay; also one Owl from Europa Island, and one Vampire Bat from the Island of Johanna, all of which may be easily recognized by a bit of twine tied round one of each of their legs.

"2. All the specimens in case No. 2 are from Johanna Island. The two larger Crabs are land ones; whilst the two smaller ones and the shells were taken from a sweet stream.

"*Note.*—The little Antelope in case No. 1 is a young male three-parts grown. There are many of them in this island, but whether they have been imported or not appears doubtful. Some people imagine they were first brought over and imported here from Arabia by the late Imaum of Muscat; but I would not recommend this belief to be accepted until further inquiry has been made; for there are pigs on this island as well as these antelopes, and it is not likely that Mussulmans would have brought them here.

"3. In furnishing these specimens, I am sorry that I cannot give you more particulars about them, since the necessities incidental to the organization of the expedition have occupied my time too much for me to make the collection with my own hands. I have, therefore, employed my Hottentot guards both in shooting and in skinning them; but I think you will find them preserved in such a manner as to be easily recognizable at first sight.

"In concluding, I would beg you to be good enough to have these as well as *all* other specimens that I may send you from Africa—after they have been duly compared and reported on—placed aside in one compartment of the Society's house until my return home to England, when I shall be able to particularize them with you.

"I have the honour to be, Sir,

"Your most obedient servant,

"J. H. SPEKE,

"To P. L. Sclater, Esq.,  
Sec. Zoological Society,  
London."

"Com. E. African Expedition."

The Secretary reported as follows in reference to this collection:—

“The case No. 1 has arrived in good order, but the glass in No. 2 has been broken, and the spirit has evaporated, leaving the preparations dry and mostly spoiled.

“The Mammals are three in number, (1) the Antelope from Zanzibar, which Dr. Gray was at first inclined to consider a new *Calotragus*, but now believes to be *Nesotragus moschatus*, von Duben, juv. Dr. Peters informs me that he likewise met with this species in the island of Zanzibar. (2) *Pteropus edwardsi*, Geoffr. (Peters, Zool. Reis. i. p. 23), nearly allied to, but according to the high authority of Dr. Peters distinct from, *Pt. medius*, Temm., of India—the species which we have now alive in our Gardens, and which is commonly called *Pt. edwardsi*. This Bat is from Johanna, Comoro Islands. (3) *Cricetomys gambianus*, Waterh., from Zanzibar.

“The birds, being in spirits, cannot be satisfactorily determined until they have been taken out and dried. This I am not willing to do until Capt. Speke’s return, and I therefore content myself for the present by stating that the three species from Delagoa Bay are of the genera *Erismatura*, *Parra*, and *Hiaticula*; that the Owl from Europa Island is a *Strix*; and that there are fifty specimens of Birds from Zanzibar referable to thirty species, mostly well known.

“The Reptilia are two, from Zanzibar, which, as determined by Dr. Günther, are *Chamaeleo dilepis* and a *Monitor*, probably *M. niloticus*.

“The birds from Johanna Island (in case No. 2) are a *Dicrurus* and a *Muscipeta*; the Crabs are of the genera *Sessama* and *Cyclographus*, and the Mollusk is a species of *Navicella*.”

The following papers were read:—

1. NOTES ON THE BROAD-FRONTED WOMBAT OF SOUTH AUSTRALIA (*PHASCOLOMYS LATIFRONS*, OWEN). BY GEORGE FRENCH ANGAS, CORRESPONDING MEMBER OF THE ZOOLOGICAL SOCIETY OF LONDON, CORRESPONDING MEMBER OF THE IMPERIAL GEOLOGICAL INSTITUTE OF VIENNA, MEMBER OF THE IMPERIAL ZOOLOGICAL AND BOTANICAL SOCIETY OF VIENNA, ETC.

The existence of a second species of *Phascolomys* on the Australian continent was established some years ago by Professor Owen, from a skull sent to England from South Australia, and named by him *Phascolomys latifrons* (see ‘Proceedings of the Zoological Society’ for 1845).

Mr. G. R. Waterhouse, in his excellent work on the *Marsupialia*, says, “Of the Broad-fronted Wombat, all that is known is a skull sent from South Australia to Professor Owen. This skull presents so many marked differences when compared with that of the *Phascolomys wombat*, that no doubt can be entertained of the existence of two distinct species of Wombats.”

I have lately had the opportunity of examining a full-grown male example of the Broad-fronted Wombat, now living in the Botanical

Gardens in Adelaide, and of comparing it with two adult specimens (male and female) of the Tasmanian Wombat, which, fortunately enough, were being exhibited at the time in Adelaide. The differences between the two species were so evident, that I was induced to make a careful drawing of *P. latifrons*, which, together with my observations and measurements of both animals, I have much pleasure in laying before the Society.

When I first saw the Wombat in the Adelaide Gardens I was at once impressed with the idea that it was an animal altogether distinct from that figured by Mr. Gould in his 'Mammals of Australia;' but as I was unable to refer to a copy of that magnificent work in this colony, I hailed with pleasure the arrival of the living Tasmanian Wombats, an inspection of which set aside all my doubts as to the distinctness of the two species.

*Phascolomys latifrons*, Owen. Adult male. Total length 38 inches. Fur fine and silky, rather long, particularly on the hind-quarters; colour light silvery mouse, tinged with buff and purplish brown, browner on the face; the chest is white; the remainder of the under surface is of a reddish mouse-colour; the feet are of the same colour as the body; the claws are smaller than those of *P. wombat*; the toes are covered with hair to the nails; under lip blackish; there is a light-coloured spot above the eye, and a corresponding one below it; with a dark triangular patch extending underneath the eyes in front towards the nostrils; eyes small, irides dark hazel; eyelids black; nose flesh-coloured; the bristles of the eyebrows are black and rather long, as are also those in the centre of the cheek and round the nostrils; tail naked and very small; the hind quarters present somewhat of that peculiarly flattened or truncated appearance observable in the ordinary Wombat; the ears are well-clothed with hair internally. The following are the dimensions of *P. latifrons*:—

	in.	lin.
Length from tip of nose to root of tail . . . . .	37	0
— of tail . . . . .	1	0
— of head . . . . .	10	0
— of ear . . . . .	3	8
Breadth between tips of ears . . . . .	8	0
— between root of ears . . . . .	5	0
— between eyes . . . . .	3	0
Girth of skull in thickest part . . . . .	18	0
— of centre of body . . . . .	28	4
Length of hind foot, including claws . . . . .	4	4
— of fore foot . . . . .	3	3
Height at shoulder . . . . .	12	0
— at hips . . . . .	14	0
Length of hind claw $\frac{1}{2}$ an inch; fore claw . . . . .	1	0

*Phascolomys wombat*, Péron et Lesueur. Adult male. Total length 33 inches. Fur very rough and coarse, of a dark grizzly-grey; ears quite small, blackish brown outside, whitish internally; nose nearly black, and more pointed than that of *P. latifrons*, giving

to the face an expression slightly resembling the "Koala" (*Phascolarctos cinereus*); whereas the *P. latifrons* presents a bold, bull-dog-like aspect from the greater expansion of his face and width of nostrils; the tail is naked and rudimentary; the feet are black, as are the hairs of the fur covering them above; the claws are black, and are longer and more powerful than those of *P. latifrons*. The general aspect of *P. wombat* is more bear-like than that of *P. latifrons*. In standing it arches its back considerably, and does not hold its head so erect as the latter animal; the expression of the eye, too, is decidedly fierce, and lacks the good-natured twinkle of the South Australian species. Next to the form of the skull, one of the most striking specific differences manifests itself in the colour, character, and texture of the fur; in sleeping it rolls itself almost into a ball, burying its nose between its fore-paws. The measurements I made of the adult male of the *P. wombat* are as follows:—

	in.	lin.
Extreme length . . . . .	33	0
Length of head . . . . .	9	0
Breadth between tips of ears . . . . .	6	9
Breadth between eyes . . . . .	3	0
Length of ears . . . . .	2	0
Girth round centre of body . . . . .	29	6
Height, middle of back . . . . .	15	0

The specimen of *P. latifrons* in the Adelaide Botanical Gardens is the only one I have yet seen. It was caught some twelve months since near the Gawler River, about thirty miles north of Adelaide. It is kept in an enclosure, where it is secured with a strong chain and collar to prevent its escape by burrowing; it is perfectly docile, and never attempts to bite, like the Common Wombat; it is fed artificially on bran and weeds, and drinks freely of water. The only sound it emits is a short quick grunt when annoyed; it sleeps a good deal during the day, and appears impatient of heat and rain, as in its wild state it is entirely a burrowing animal, living in large holes in the limestone districts, and only leaving its habitation towards dusk for the purpose of obtaining food. The specimen in the Gardens is fond of lying on its back like a bear, the feet are thoroughly plantigrade, and on the inner hind toe the claw is quite rudimentary. He will burrow 3 or 4 feet into the soft ground of his enclosure, and scratches alternately with his fore paws. When worried he will turn his hind quarters to the enemy, and, suddenly turning round, make a charge at his legs, evidently for the purpose of throwing him down; otherwise he is perfectly harmless. He runs fast for a short distance in a sort of gallop, but soon tires, and is easily caught. Although in some parts of the colony, especially on Yorke's Peninsula and about Port Lincoln, the holes of these Wombats are very numerous, yet the animals are but rarely seen. Many of the oldest colonists have informed me that they never saw a Wombat alive. The blacks on the Murray describe two kinds of Wombats, one (evi-

dently *P. latifrons*) they speak of as "big yellow fellow," the other as being smaller and dark; they also say that the impressions of their feet in the sand-tracks leading to their burrows bear a striking resemblance to those of the foot-prints of a young child. The flesh they describe as being like pork, and excellent eating; they are extremely difficult to obtain on account of their great timidity. The usual plan is to make a screen of boughs in the vicinity of their haunts, behind which the natives conceal themselves; and then, if not killed on the spot, they will scramble to their holes, from whence it is utterly impossible to dislodge them.

Collingrove, South Australia,  
April 1861.

## 2. NOTICE OF THE OCCURRENCE OF SCLEROSTOMA EQUINUM? IN THE TESTICLE OF THE HORSE. BY W. BAIRD, M.D., F.L.S.

The entozoon known by the name of *Sclerostoma equinum* or *armatum* has long been known as infesting the Horse. According to Rudolphi, Dujardin, and Diesing, it is very common at all seasons of the year in the large intestines of that animal, as well as in the Ass and Mule. It occurs also, though more rarely, in the duodenum and pancreas, and a smaller variety is not uncommon in the aneurismal sacs of the mesenteriac and cœliac arteries of these animals, which appear to be liable to that disease. As far as I am aware, however, this parasitic worm has only been once observed, and that by Gurlt, as occurring in the testicle of any of these animals. This author has recorded his having found it in the tunica vaginalis of the Horse. Lately a specimen of what appears to be another variety of this species was received by Professor Owen from a gentleman who had taken it from the substance of the testicle of a young colt which had just been gelded. Only one individual was sent—a female; and though it differs somewhat from the ordinary specimens of the *Sclerostoma equinum* in the horse, as characterized by the authors mentioned above, I am unwilling to describe it from a single individual as a distinct species. The specimen is about an inch in length, and is strongly marked with transverse rings, which encircle the body, but appears destitute of the longitudinal striæ which Rudolphi and Dujardin describe as distinguishing the *equinum*. The circular rings on the centre of the body are about the fourth, but nearer the head only a third, of a millimetre apart from each other; whilst in the ordinary specimens of *equinum* they are described as being very fine, and according to Dujardin only 0.0043 mill. The tail, too, is much more obtuse than in the ordinary specimens of the *equinum*, and the whole animal is more robust, though not longer. The specimen appears to be an immature individual; and as I have not been able to refer to Gurlt's notice of the specimens he found in the tunica vaginalis of the testicle of the horse, I must satisfy myself at present with merely recording the fact of its being found in this country

also, trusting to have an opportunity at some future time of examining additional specimens.

### 3. DESCRIPTION OF A NEW SPECIES OF PANDORA. BY SYLVANUS HANLEY.

*PANDORA CUMINGII*. *Testa magna, semilunaris, maxime inæquilateralis, concentricè obsolete undata. Latus anticum perbreve, haud (ut in P. ceylanica) latus posticum valde productum et sensim rostratum in latitudine superans. Rostrum acclive, ad apicem satis (vix tamen in adultis) angustum, obtuse subbiangulatum. Margo dorsalis anticus subito declivis; posticus notabiliter incurvatus; ventralis perarcuatus et utrinque æqualiter acclivis. Area dorsalis lata, complanata. Nates acutæ, conspicue elevatæ. Cardinis dentes haud longi.*

Long.  $1\frac{1}{2}$  poll., lat.  $\frac{5}{8}$  poll.

*Hab.* Samar et Negros, Insulas Philippinas (*Cuming.*), in luto arenoso.

This falchion-shaped *Pandora* exhibits the general aspect of *P. ceylanica* (Sowerby), but the sides are much more unequal, and the front one is no broader than the hinder. The groove which runs below the incurved dorsal margin is less narrow than is usual in this genus.

### 4. DESCRIPTION OF A NEW GENUS OF SHELLS FROM THE COLLECTION OF HUGH CUMING, ESQ. BY HENRY ADAMS, F.L.S.

Genus ALORA, H. Adams.

*Testa ovato-fusiformis, vix umbilicata, tenuis; spira elevata; anfractibus convexis; liris elevatis spiralibus et lamellis tenuibus cancellatis; apertura ovali, antice producta; labio lævi, rotundato, antice subreflexo; labro margine simplici, acuto.*

Shell ovate-fusiform, slightly umbilicated, thin; spire elevated; whorls convex, cancellated with elevated spiral ribs and thin lamellæ; aperture oval, produced in front; inner lip smooth, rounded, slightly reflexed at the fore part; outer lip simple, acute.

Ex. *Alora gouldii*, H. Adams.

*Trichotropis gouldii*, A. Adams.

This shell, described by my brother as a species of *Trichotropis*, has been supposed by some to belong to the family *Melaniidæ*, and to have been washed down the River Chiriqui, in the Province of Veragua, near the mouth of which the first specimens were found. The Rev. P. P. Carpenter, however, informs me that specimens have since been procured from Panama by Judge Cooper and Col. Jewett, of New York, and that it is truly marine. The genus differs from *Trichotropis* in the produced, *Melania*-like aperture, and in the absence of a canal.

5. OBSERVATIONS ON MR. DU CHAILLU'S PAPERS ON "THE NEW SPECIES OF MAMMALS" DISCOVERED BY HIM IN WESTERN EQUATORIAL AFRICA. BY DR. JOHN EDWARD GRAY.

Mr. Du Chaillu, in a maiden zoological paper in the 'Journal of the Natural History Society of Boston,' for 1860 (pp. 296 and 358), describes fifteen species of Mammals, and gives a short notice of a sixteenth, which he collected in Equatorial Africa, and which he believes to be undescribed.

Having lately had the opportunity of examining these animals, I am induced, in response to Mr. Du Chaillu's challenge, to lay before the Society the following observations on them.

I may observe that the determinations are founded on the comparison of the specimens named by Mr. Du Chaillu with typical specimens in the collection of the British Museum.

TROGLODYTES CALVUS, sp. nov., Du Chaillu, Boston Journ. N. Hist. 1860, p. 296; Travels, t. 32. p. 232, t. 48. p. 357, t. 63. p. 422.

TROGLODYTES KOOLOO KAMBA, Du Chaillu, Bost. J. p. 358, Travels, t. 39. p. 270, t. 49. p. 360, t. 50. p. 361.

I have examined the skins of these presumed new species, and I am not able to discover any character by which they can be distinguished from the common *T. niger*. Dr. Sclater and my assistant Mr. Gerard have each examined the skulls and skeletons, and they inform me that they have come to the same conclusion; and I observe that the writer of chapters 20 and 21 of Mr. Du Chaillu's 'Explorations,' and Professor Owen, both speak of them as interesting varieties of that species. The baldness appears to be only an individual peculiarity of the specimen; the hair seems to have been worn off: the skin, like most of the others, is in a very bad state.

The common Chimpanzee has been described long ago as forming a shelter of boughs and leaves; so that it could not be a peculiarity in the *T. calvus*; and it is very doubtful if this does not arise from their having been observed sitting under the shelter of some parasitic plant, perhaps a *Loranthus*.

Dr. Franquet, in the 'Archives du Mus.,' is inclined to believe that there are three species or varieties of the Chimpanzee. Mr. Du Chaillu, in the paper above referred to, doubts the distinctness of these, and believes Dr. Franquet has described as distinct the old and young of the common Chimpanzee.

(See observations on Mr. Du Chaillu's figures of the animal in 'Ann. and Mag. N. Hist.' 1861, June, p. 463 *et seq.*)

I may observe that one skull of an old animal in the collection differs from the other Chimpanzee's skull in the lower edge of the lower jaw being straighter and more at a right angle with the ramus of the jaw, and in having the hinder angle rather more produced. This makes the skull stand erect on its base, whilst the others are inclined to fall backward on the condyles; but this must be only an

individual peculiarity. The same difference of form is said to occur in the skulls of the Gorilla.

**CERCOPITHECUS NIGRIPES**, Du Chaillu, Bost. Journ. p. 360.

This species is evidently different only in age from *Cercopithecus erxlebenii*, Dahlb. & Pucheran in Rev. Zool. 1856; Dahlb. Studia Zool. i. 102, t. 5. f. 12.

Mr. Du Chaillu's specimen and the one in the British Museum have the sides blacker than in the figure above cited; the latter is said to be from a young specimen. It has been compared with *C. pogonias*.

**OTOLICNUS APICALIS**, Du Chaillu, *l. c.* p. 361.

The specimen of this species is formed on evidently an *Otolicnus* or *Galago*; but it is in a very bad state, and the ears are quite destroyed, apparently by mice or cockroaches.

The white at the end of the tail I should say was an accidental or individual peculiarity, not a specific mark. It is very like *Galago crassicaudatus*, judging from the description.

There is a young animal in the collection, that appears to belong to the same species, which has not the white tip to the tail.

**GENETTA FIELDIANA**, Du Chaillu, *l. c.* p. 302.

This species is only the *Genetta pardina* of I. Geoffroy. It is erroneously stated by Mr. Du Chaillu to be allied to *G. poensis*.

**CYNOGALE VELOX**, Du Chaillu, *l. c.* p. 361.

The specimen is in a bad state: only a skin (skinned by the mouth), with only three feet, the end of the tail broken, and without any skull.

The feet are rather small and weak; the toes compressed, not webbed; the five toes of the forefeet all free; the five of the hind feet very unequal, the two outer being the strongest and longest, the two middle rather shorter, more slender, *united* together to the nail; the inner much shorter, slender, and free; claws all compressed, curved. The tail is very strong, thick (compressed in the skin), and covered with short close-pressed hairs; the upper part of the base and the narrow central ridge along the upper surface covered with longer hairs, like the back. The fur, like that of the Otter, with longer, flat, striated hairs. Whiskers very long, rigid. Ears thin (part eaten), small.

This may be a *Glirine* animal; it certainly has no affinity to my genus *Cynogale*. It is more like the genus *Fiber*, which has a similar tail.

Mr. Du Chaillu observes: "Only a single species of *Cynogale* being described, and that a native of Asia, I thought the different shape and proportions of the tail, with its African habitat, were sufficient to make this the representative of a different genus, for which I propose the name of *Potamogale*. Preferring, however, to wait until I

can procure the skull and skeleton, I have placed it in the genus *Cynogale*, to which it certainly bears a close resemblance;" and, again, "the teeth resemble those of the above genus of Gray, as well as the general appearance; but the size of the animal, the length and character of the tail, and the habitat, indicate a distinct species."

I may state that the animal has no relation to the genus *Cynogale*; and, from the form of the feet, I suspect it is a Glirine and not a Ferine animal—perhaps more allied to *Fiber* than *Cynogale*. I cannot conceive that Mr. Du Chaillu's proposed name of *Potamogale* has any claim to be adopted, as he gives no character to it, and the description of the feet which he gives is very incorrect, and does not at all fit the specimen; so much so that, if the character of his genus were drawn from his description, no one could recognize the animal, especially as he does not know the toes from the claws!

His description is as follows:—"Extremities small, the first joint enclosed within the skin of the body; feet five-toed, plantigrade behind; soles bare; claws curved and sharp; fore claws (!) very slightly, if at all, webbed; hind claws (!) partially webbed, and the external border of the tarsus fringed with a membrane; tail stout, compressed laterally, the terminal three-fourths sharp above, and at the end below, terminating in a point."

I therefore propose that it should be called *Mythomys*, which may be thus characterized:—Skull and teeth unknown. Whiskers elongate, rigid. Toes 5.5, compressed, elongate, free, except the two middle toes of the hind feet, which are united together to the claws. Tail thick, compressed, covered with short adpressed hair, except at the base and along the upper margin, where it is covered with elongated, close, soft fur. Fur soft, with flattened, elongated hair, produced beyond the fur as in *Fiber* and *Castor*, or *Hydromys*; its tail is very like *Fiber*, only much thicker and stronger.

*Mythomys velox* = *Cynogale velox*, Du Chaillu.

*Mythomys*

*ANOMALURUS BELDENI*, Du Chaillu, *l. c.* p. 303; *Travels*, p. 455 (not fig.).

This is *Anomalurus derbianus*, Gray (*A. fraseri*).

The figure given as the species in the '*Travels*,' p. 455. t. 70, is copied from Ford's figure of *A. beecroftii*, *Proc. Zool. Soc.* 1852 (*Mammalia*, Pl. XXXII.).

*Anomalurus*  
Beldeni  
N. H. 1861  
80

*ANOMALURUS* —? New species not yet described (*Travels*, Appendix).

There are two specimens so marked in the collection; they are *Anomalurus beecroftii*, Fraser, *Proc. Zool. Soc.* 1852, t. 32.

The tails of the two specimens are short in the skins: but one is imperfect, and the other has had the bones partly pulled out; so that the tail is apparently shorter than it really would be in the perfect animal.

These animals, which appear to be more allied to *Myoxus* than *Sciurus*, are nocturnal, and rest quiet during the day in dead trees.

**SCIURUS NORDHOFFII**, Du Chaillu, *l. c.* p. 363.

This is a dark state of *Sciurus stangeri*, Waterhouse. It has the characteristic short black streak behind the ears of that species well marked.

**SCIURUS EBORIVORUS**, Du Chaillu, *l. c.* p. 363; *Travels*, p. 282, t. 41. Mboco, or Ivory-eater.

This is likewise a state of fur of *S. stangeri* with red feet; it also has the streak at the back of the ear well marked.†

I may observe that the Common Rat eats elephant's tusks, and is said to choose the best.

**SCIURUS WILSONII**, Du Chaillu, *l. c.* p. 364.

This is also probably a state of fur of *Sciurus stangeri*; but it may be distinct, as the black streak behind the ears is not to be seen. If it is distinct, it is very nearly allied to that species; but I think it probable that, when more specimens are obtained, they may all three prove to be only a single species.

It agrees with *Sciurus mutabilis*, Peters.

**SCIURUS SUBALBIDUS**, Du Chaillu, *l. c.* p. 365.

This is the *Sciurus rufobrachium* of Mr. Waterhouse.

**SCIURUS RUBRIPES**, Du Chaillu, *l. c.* p. 366.

This is *Sciurus pyrrhopus* of F. Cuvier. The two specimens in the collection differ from the Museum specimen in being larger, and in having the crown of the head and legs deep bay; but this is just the character of a more adult animal.

It is to be observed that the *Sciuri* are exceedingly variable in their colour, even specimens taken in the same locality and at the same time; and M. Temminck has shown that they present two states of fur and colour according to the seasons.

**SCIURUS MINUTUS**, Du Chaillu, *l. c.* p. 366; *Travels*, p. 453, t. . Keudo Squirrels, not characteristic.

I have not seen this species before. The figure, which I think I recognize as copied, gives little or no idea of the character of the species. The tail is varied; that is, it has a pale-edged darker border.

I believe it is *Sciurus palliatus*, Peters, *Monatsb.* 1852, p. 273; *Reise nach Mossambique*, p. 184, t. 31. f. 1, t. 32. f. 3, skull.

**TRAGELAPHUS ALBOVITTATUS**, Du Chaillu, *l. c.* p. 299; *Travels*, t. 44. p. 306.

This is evidently only a specimen of *Antilope euryceros* of Ogilby, *P. Z. S.* 1836, p. 120; *Tragelaphus euryceros*, Gray, *Cat. Ung. B. M.* 137.

Mr. Du Chaillu observes, "In coloration it somewhat resembles the *T. euryceros*, Gray." Yet in the 'Athenæum Journal,' 25th May, 1861, he states "that he now for the first time brings a skin."

Our specimen came from the Bight of Biafra. Mr. Du Chaillu says it is found in forests in the interior, and not in maritime plains or flat country (p. 301).

The specimen is without hoofs, ears, or tail!

POTAMOCHÆRUS ALBIFRONS, Du Chaillu, *l. c.* p. 301; *Travels*, t. 62 at p. 422, is *P. penicillatus*, Gray, P. Z. S. 1852, p. 129.

This animal differs in the colour of the face from black to white. Specimens of both varieties are in the collection. It is called the Camaroon River Pig; but Mr. Du Chaillu says it inhabits high table-lands, both on the coast and at the head-waters of Fernando Vah.

MANATUS OWENII, Du Chaillu, *l. c.* p. 367.

I may observe that I cannot find any distinction between this and the other African Manatees, which have been called *M. senegalensis*, *M. latirostris* and *M. vogelii* (P. Z. S. 1857, p. 29).

The African species are distinguished from the American one by the larger size of the malar bone, and in the base line of the lower jaw being more curved. In the American skull the lower edge of the malar bone is nearly straight, with a moderate-sized rugose tubercle in the middle. In the African skull the lower edge of this bone is more or less produced, according to the age of the animal, forming a rounded lobe, which is largest in the adult skull, and giving a nearly semicircular form to the lower edge of the bone.

The skulls of Mr. Du Chaillu's specimens exactly agree with the figure of the skull of *M. senegalensis* in Blainville's 'Ostéographie.' The skull figured in the same work, named *M. latirostris*, is like our younger one from the W. African coast.

There are three skulls and imperfect skeletons in Mr. Du Chaillu's collection; the skulls appear to become broader, the central space on the top of the head wider, and the tubercle on the under side of the malar bone larger as the animal increases in age.

The adult form is shown in Dr. Baikie's figure, P. Z. S. 1857, p. 29, t. 51.

#### TROGLODYTES GORILLA.

The first indication of the Gorilla which I recollect to have seen was an imperfect skull (which had been used as a fetish) that was brought from the Gaboon by Mr. Bowdich on his return from the Ashantee Mission in 1817. This skull, it was then thought, might be that of an adult Chimpanzee; though Bowdich in his work (pages 440, 441) mentions both the Incheo (*Troglodytes niger*) and the Ingéna (*T. gorilla*) as distinct kinds.

Mr. Thomas Savage, the American Missionary at the Gaboon, having obtained several skulls, in 1847 pointed out the distinction between the skull of the Gorilla and the Chimpanzee; and Professor Owen followed up the subject, and figured two skulls in the 'Proceedings of the Zoological Society' for 1848, observing that "some scepticism might be expected as to the alleged specific distinction of the large and small Chimpanzee by naturalists who had not been

able to realize the differences by actual comparison of specimens."—P. Z. S. 1848, p. 34. But to show how little these describers knew of the perfect animal, I may state that an adult male black Chimpanzee was offered by Mr. Henry Stutchbury to the British Museum as "an adult female Gorilla;" and this specimen was afterwards purchased by a foreign Museum, and has been exhibited since as a "Gorilla."—See *Commission on the British Museum*, 1849, App. No. 19, p. 12.

For not believing that this black animal was a "Gorilla," I have been represented as doubting the distinctness of the species.

On the other hand I may state that a specimen of a young Gorilla was exhibited for some months in Wombwell's Menagerie in the North of England as a Chimpanzee, and was as tame and tractable as the young of that animal usually are. This specimen is now preserved at Walton Hall, Wakefield.

6. REPORT OF A COLLECTION OF MAMMALS MADE BY OSBERT SALVIN, ESQ., F.Z.S., AT DUEÑAS, GUATEMALA; WITH NOTES ON SOME OF THE SPECIES, BY MR. FRASER. BY ROBERT F. TOMES, CORR. MEM. Z.S.

(Plate XXXI.)

1. DESMODUS RUFUS, Pr. Max.

A great many specimens have been brought home by Mr. Salvin, and a smaller number by Mr. Fraser. The latter gentleman says, "Native name *Murcilago*, very common. I find nothing but blood in the intestines and stomach. My mule is bitten every night; cannot say by what."

2. GLOSSOPHAGA LEACHI, Gray, sp.

*Monophyllus leachii*, Gray, Zool. Voy. Sulph. Mamm. p. 18, 1843.

Of this species I find but one specimen in the collection. This I think somewhat remarkable, as it is abundant in Central America, and has a considerable geographical range. Great numbers have been collected in Mexico, and forwarded to Europe by M. Sallé.

3. STURNIRA —?, n. s.

The head of a small species with white facial stripes, somewhat like those of *Arctibeus lineatus*. It is smaller in size than *Sturnira lilium*, and has a rather more obtuse muzzle.

? 4. SCOTOPHILUS URSINUS.

*Vespertilio ursinus*, Temminck & Le Conte.

*Vespertilio carolinensis*, Geoffroy.

The types of *V. carolinensis* contained in the Paris Museum present two distinct varieties, which however appear to vary in no other respects than that of size. The larger one has been subsequently called *Vespertilio ursinus* by M. Temminck; and in this separation



J. Wolf, del et lith.

M & N. Hanhart, Imp<sup>t</sup>.

MYOXOMYS SALVINI.



into two species he has been followed by Major le Conte. That the *V. ursinus* of these authors is identical with the larger specimen of *V. carolinensis* in the Paris Museum, I am able to state from actual inspection of the types. It remains for further observation to determine whether they are really distinct. Only one specimen appears in the present collection, although a great number have been collected by M. Sallé in Mexico.

#### 5. SOREX MICRURUS, n. sp.

The present species, which I believe to be new, is in size somewhat inferior to the European *Sorex vulgaris*. In general form it is not unlike that species, excepting that it has a very short and slender tail.

In its dentition it approximates pretty closely to the species composing the group of American Shrews, which has been defined by Prof. Baird in the following terms:—"Third premolar larger than the fourth, smaller than or equal to the second." The species thus characterized are *Sorex pachyurus*, *S. forsteri*, *S. richardsonii*, and *S. platyrhinus*. From these, as well as from other Shrews from Coban, which have been named by Dr. Gray, it differs remarkably in the small size of the tail.

The fur is rather long for the size of the animal, very thick, soft, and a little glossy. The general hue of all the upper parts is darkish grey-brown, with a slightly grisly appearance. It is darkest on the top of the nose and top of the head, and thence along the middle of the back to the root of the tail. On the sides of the back it is a little paler, and from this it becomes insensibly paler on the sides of the body, until the whole under surface may be called a lightish grey-brown, tinged on the chin and along the middle of the abdomen with yellowish rufous. On all parts of the body the fur is lead-coloured at the root, paler above than beneath. The feet and tail are clothed with thinly scattered short hairs, of a lightish grey colour.

	1.		2.	
Length of the head and body . . . . .	2	5	2	4
———— of the tail . . . . .	0	10	0	10
———— of the head . . . . .	0	9	0	9½
———— from end of nose to eye . . . . .	—	—	0	4¼
———— from end of nose to ear . . . . .	—	—	0	7
———— of the fore foot and claws . . . . .	0	4	0	4
———— of the hind foot and claws . . . . .	0	5½	0	5½

The above description has been drawn up from three specimens, two of which, being preserved in spirits, have furnished the above dimensions, and from the third, which is preserved in skin, the quality and the colouring of the fur have been noted.

6. LUTRA CHILENSIS, Benn. P. Z. S. 1832, p. 1; Waterh. Zool. Voy. Beagle, Mamm. p. 22.

The specimen collected in Guatemala by Mr. Salvin agrees with

the description and figure given by Mr. Waterhouse of *L. chilensis*. Especially the inner lobe of the *carnassier* tooth may be noted as having the same angular form as in that species. In *L. platensis* the inner lobe of the *carnassier* approaches more or less to a semi-circular form. I regret that I have examined neither specimen nor figure of *L. californica*; but the figure of the cranium of *L. canadensis*, given by Prof. Baird, exhibits the same form of *carnassier* tooth as in *L. platensis*.

7. FELIS MITIS, F. Cuv.

8. CERCOLEPTES CAUDIVOLVULUS, Illiger.

9. NASUA FUSCA, Desmarest.

10. MEPHITIS MESOLEUCA, Licht. ?

M. de Saussure, in the 'Revue de Zoologie' for 1860, p. 6, has described a species of *Mephitis* from Mexico, which he says is intermediate between *M. leuconota* and *M. mesoleuca*, but has the size of the latter; *i. e.* about that of a cat. It has a single white dorsal line which terminates angularly on the top of the head, and is continued along the middle of the back, becoming narrower as it approaches the tail—the terminal two-thirds of which are wholly white. The length of the head and body is stated to be 15 or 16 inches (French), and the tail 9 or 10 inches. The provisional name of *M. intermedia* is proposed for the species.

The specimen from Guatemala, while it agrees in some degree in size with the Mexican one, has a much longer tail and a much smaller proportion of white on the back and tail. I describe it as follows.

Wholly black, with a small elongate white spot on the forehead, and a broad white stripe which commences abruptly on the top of the head between the ears, and passing backward along the neck becomes narrower as it reaches the shoulders, and about the middle of the dorsal region divides into two narrow and ill-defined lines, which extend to the hips, and are then lost. On the rump the hair is wholly black, and outwardly the tail appears of the same colour. However the hairs for fully two-thirds from its end are white at their root for a fourth of their length.

Length of the head and body, about . . . . .	1	4
——— of the tail, about . . . . .	1	5

*Obs.* The concealed white of the terminal part of the tail leads me to suspect that, at a more advanced age, that part might become wholly white; and the resemblance to *M. mesoleuca* would then be much greater. Should it, however, prove that the animal of which I am now speaking is in adult livery, it must be regarded as distinct; and I would then propose for it the name of *M. longicaudata*. No specimen resembling this is contained in our National Collection.

11. VULPES CINEREO-ARGENTATUS.

A flat skin, and a very young specimen in skin.

12. *DASYPROCTA AGUTI*, Linn.13. *LEPUS PALUSTRIS*.

*Lepus palustris*, Bachm. J. A. N. Sci. Philad. vii. 1837, pp. 194 & 336; Waterh. Nat. Hist. ii. p. 119.

*Lepus douglasii*, Gray, Mag. Nat. Hist. 1837, p. 586.

14. *SCIURUS LUDOVICIANUS*.

*Sciurus ludovicianus*, Custis, Barton's Med. et Phys. Journ. ii. 1806.

*Sciurus magnicaudatus*, Harlan, Faun. Amer. 1825, p. 178.

*S. rufiventer*, Desm. Mamm. p. 132, 1822.

*S. macroura*, Say, Long, Exped. i. p. 115, 1823.

*S. subauratus*, Bachm. P. Z. S. 1838, p. 274.

15. *SCIURUS CAROLINENSIS*.

The specimens contained in Mr. Salvin's collection differ from the ordinary specimens of *S. carolinensis* in being smaller and much more strongly tinged with brown or rufous. There are not sufficient grounds, however, for regarding them as distinct from that species, the differences being such as we might expect to meet with.

16. *SCIURUS* — ?17. *SCIURUS* — ?

I am at present wholly unable to determine these two species with certainty, and prefer therefore rather to leave them unnamed than to run the risk of adding to the confusion of nomenclature which is already so great amongst the American *Sciuridæ*.

18. *PTEROMYS VOLUCELLA*.

Only one specimen appears, from which unfortunately the skull has been removed. It holds precisely the same relation in colour to North American specimens as that which I have noticed in the case of the Guatemalan examples of *Sciurus carolinensis*. It is everywhere much more strongly tinged with rufous, and has the fur a little coarser. In size it resembles examples from the United States.

19. *SIGMODON BERLANDIERI*, Baird.

The present species differs merely from the well-known *S. hispidum* in being a little larger, and rather paler in colour. It is very doubtfully distinct from the latter species. From the number of specimens collected by Mr. Salvin and Mr. Fraser in Guatemala, and by M. Sallé in Mexico, it would appear that the *Sigmodon* is very abundant in Central America.

20. *MUS MUSCULUS*.

Two specimens only of this species have come to hand; and these would scarcely deserve comment, excepting that, although obviously adult, they are of smaller size than European specimens. Others collected by Mr. Fraser at Pallatanga resemble in this respect those from Guatemala.

21. *NEOTOMA FERRUGINEA*, n. sp.

The present species of *Neotoma* is so well-marked a species, that it will be scarcely necessary to lengthen the description by comparing it with other species of the genus.

It is typically a *Neotoma*, and in size about equals the *Mus rattus* of Europe. General form rat-like; the head rather elongate, and the muzzle somewhat pointed. Muffle small, being little more than a flat space between the nostrils, and with scarcely any part quite free from short, fine, scattered hairs. Upper lip cleft from the muffle downwards, and well covered with short hairs; nostrils rather small and rounded. Ears simple, roundish, of medium size, and not concealed by the fur. Whiskers quite as long as the head. Fore feet short; the two middle toes of equal length, the outer one about  $1\frac{1}{2}$  line shorter, and the inner one not more than 1 line shorter; claws very short, thumb rudimentary, its nail rounded. Palms with five well-defined and rather large tubercles, of which the anterior one occupies a position at the root of the middle toe, two others are placed one at the root of each of the outer toes, and the remaining two have a transverse position behind those just mentioned, nearly as far back as the carpus, the outer one being a little the further back of the two. The hind feet are remarkable for their breadth, and for having, like the fore feet, toes which are nearly of a length. The tibia is rather long in relation to the foot, although perhaps not in relation to the size of the animal. On the sole of the hind foot are six tubercles, the three anterior ones arranged like those of the fore feet, and a fourth appears at the root of the inner toe. Immediately behind the tubercle of the outer toe, and near to the middle of the sole, is placed the fifth, which is much smaller than the others; and behind that of the inner toe is the sixth, much the furthest back, and near the inner boundary of the sole. The arrangement of these tubercles is much the same as in *N. floridana*; but in consequence of the shortness of the foot, they are of a less elongated form, though fully as prominent. The claws, like those of the fore feet, are short. The tail is as long as the head and body, and tapers evenly to a somewhat obtuse point; it is finely annulated, and pretty evenly suffused with short black hairs, which, even towards the end of the tail, where they are most abundant, do not conceal the scales. The under surface is much less distinctly hairy than the upper.

The distribution of hair on the under surfaces of the fore and hind feet is as follows:—Short and thick fur, of nearly the same quality as that of the body, extends on the fore legs quite to the carpus; it is white inside the leg, and of the same colour as the upper parts of the body outside of it. On the upper surface of the toes the hairs are silvery white, adpressed, short, and projecting forward around the claws so as to hide them. The hind legs have the tibiæ densely hairy behind, quite to the *os calcis*, and from thence there is an extension of adpressed greyish hairs along the inner side of the sole to the posterior tubercle; but there is a very narrow line left near the outer boundary of the sole, which is quite free from hairs. On the upper surface of the foot the hair of the legs extends somewhat

further, and from this the foot is covered with short, adpressed, silvery hairs, grey on the foot and white on the toes.

The general colouring is remarkable, and unlike that of any other species of *Neotoma*. All the upper parts are of a bright rufous colour, and all the under parts pure white, the line of separation being very clear and distinct. The fur of the back is mixed with black hairs, giving that part a much darker colour than the sides of the body, where these hairs are less abundant. Fur of the outer surface of the fore and hind legs strongly tinged with dusky, inner surface of the fore legs whitish, of the hinder ones dusky grey. On nearly all parts of the body the fur is bicoloured, dusky at its roots for two-thirds of its length; on the upper parts the dusky colour becomes almost black, and on the under much paler. From the chin to the space between the fore legs is an elongated patch of fur which is pure white from root to tip, just as in *Hesperomys atrogularis*. The tail is deep dusky above, paler below; claws white.

In the outline of the grinding-surfaces of the molar teeth, this species differs from all others at present described. Without entering into a minute description of these teeth, of which it is difficult to give a clear idea without figures, it may be stated that they have somewhat the same arrangement of cusps as those of *N. cinerea* of Baird, saving that in the present species the anterior cusp or prism of the first tooth in the lower jaw is in a position decidedly outside the line of the cusps of the other teeth. The exposed ends of what I have termed the prisms of these teeth constitute their grinding-surface, which, instead of having an angular outline as in *N. cinerea*, present, as in those of *N. floridana*, [a series of transverse ovoid or loop-like figures; but these loops in the present species are much narrower in an antero-posterior direction than in any other species, owing to the folds of enamel entering more deeply and broadly into the sides of the tooth.

Length of the head and body . . . . .	6	6
—— of the head . . . . .	1	9
—— of the ears . . . . .	0	8
—— of the fore-arm . . . . .	1	3
—— of the fore foot and claws . . . . .	0	8
—— of the tibia . . . . .	1	5
—— of the tarsus and toes . . . . .	1	3
—— of tail . . . . .	6	0
Breadth of the ears . . . . .	0	8
—— of the hind feet at the root of the inner toe . . . . .	0	3
Length of the skull from the front of the nasal bone to the occipital crest . . . . .	1	8
Breadth across the zygomatic arch . . . . .	0	11
Length of the nasal bones . . . . .	0	8
—— from the point of the upper incisor to the crown of the first molar . . . . .	0	6
—— of the molar series . . . . .	0	4

Length of the incisive foramina . . . . .	0	4
——— of the palate . . . . .	0	4
Breadth of palate between two front molars..	0	1½
——— of palate between two posterior molars	0	2
Length of lower jaw from point of incisors to condyle . . . . .	1	0
Depth from coronoid process to the angle. . . .	0	6

22. *HESPEROMYS* — ?

Closely resembles *H. leucopus*; but the cranium is a little narrower, and the general colour of the fur much more rufous.

23. *HESPEROMYS* — ?24. *REITHRODON LONGICAUDA*, Baird.25. *REITHRODON MEXICANA*, De Saussure, Rev. Zool. 1860, p. 109.25. *HESPEROMYS (MYOXOMYS) SALVINI*.

Since the publication of my last notes on Mammals collected by Mr. Fraser, I have had occasion to examine anew the species of *Hesperomys* mentioned therein, and have compared them with a more extended series of species. The result is a considerable modification of the classification which I then adopted. It is not my intention to enter now into the distinction of the several groups of *Hesperomys*; but it is necessary that I should define one of them, for the purpose of afterwards describing a remarkable species contained in the present collection.

Subgen. *MYOXOMYS*.

General form much resembling that of *Myoxus*; muzzle short, but not swollen; eyes large; ears variable in size, roundish, and not concealed by the fur; feet very short and broad, toes differing from each other in length only; palms and under surfaces of toes thick and fleshy, with their tubercles well developed; nails very short; tail fully as long as the body, sometimes much longer, of nearly uniform size, and suffused with hairs, which are most abundant towards and at the extremity; fur short, fine, and without gloss; the colours of the upper and under parts of the body divided by a well-marked line.

Skull broad, its nasal region short; zygomatic arches much expanded; space between the orbits broad, and bounded by a well-developed supra-orbital crest; ante-orbital foramen large, the bony plate which encloses it very narrow, so that it opens forward and not at all upwards; palate extending posteriorly only to the boundary of the molar series; condyloid process of the lower jaw considerably longer than either the coronoid or descending processes.

Ex. *Myoxomys salvini*, n. sp. (most typical species).

*M. latimanus*, Tomes.

*M. bicolor*, Tomes (least typical species).

*Obs.* It is probable that this subgenus will have to be elevated to the rank of a genus, as it possesses more strongly marked characters than any group yet indicated, if we except *Oryzomys*, which must be regarded as a genus.

26. *HESPEROMYS* (*MYOXOMYS*) *SALVINII*, n. sp. (Pl. XXXI.)

In general form this species bears great resemblance to the *Myoxus nitela* of Europe, and it is of nearly the same size. The head is short and rather broad; but the face, although broad also, has the muzzle somewhat pointed. The muffle is of small size, quite naked, and cleft vertically; beneath the nostrils, which are crescent-shaped, are two descending points. The cleft in the muffle is continued through the upper lip to the teeth. The whiskers are long, almost twice the length of the head, and black. The ears are rather large for the size of the animal, broadly oval, and sparingly clothed with short inconspicuous hairs inside and out.

The fore feet are rather broad, short, and have the middle toes not exceeding the others in length by more than a line; the thumb is rudimentary, and its nail short and truncated. The tubercles of the palms are large, roundish, and prominent; they are five in number—one at the root of each of the middle toes, one at the root of each of the outer toes, another constituting the inner surface of the rudimentary thumb, and the remaining one near the outside of the palm directly opposite to the thumb. The toes themselves have their inner surfaces very thick and fleshy, especially at their ends; and they have transverse depressions, which are less distinctly marked and further apart than in most species of *Hesperomys*. The hind feet are remarkably short and broad, and have the toes so nearly of a length that the middle ones are scarcely half a line longer than those on either side of them; the inner toe is scarcely half the length of the one next to it. When seen from beneath, the ends of all the toes are thick and fleshy, like so many fingers; and, indeed, the foot, when seen from this position and the toes partially closed, has more the appearance of the foot of a cat than of one of the *Muridæ*. This arises not merely from the form of the fingers themselves, but also from the size and form of the tubercles on the sole of the foot. These are six in number, rounded and prominent. The three anterior ones are arranged like those of the fore feet, the fourth is at the root of the inner or small toe, the fifth behind the tubercle of the outer toe, and near the outside of the sole, and the sixth behind that of the inner toe, and consequently posteriorly to all the others. The claws of all the feet are short and white. The sole of the hind foot has its posterior third well clothed with hairs, but the tubercular part (as well as the under surface of the toes) is perfectly naked. The tail is about the length of the head and body, and tapers only in a trifling degree; it is annulated with small scales, which are nearly concealed by longish black hairs, which become thicker towards and at the end, where they form a kind of pencil.

The general colour is like that of *Neotoma ferruginea*, viz. brightish rufous on all the upper parts, with a mixture of blackish hairs along

the back, where the rufous colour is less pure than on the sides of the body. On the outside of all the limbs this colour is considerably tinged with dusky. A narrow black line runs from the roots of the whiskers to the eye, and narrowly fringes the latter. The upper surface of the fore feet is brownish white, of the hinder ones white, with a dusky patch extending along their middle as far as to the roots of the toes, the latter being wholly white. All the under parts are pure white, as are the insides of the fore legs and the thighs. The line of separation of the colours of the upper and under parts is very distinct; it extends along the cheek to the whiskers, leaving only a narrow band of rufous under the eye. The white fur of the under parts is uniformly white from root to tip; but that of the upper parts is darkish ash-coloured at the root for two-thirds of its length.

The skull of this species is of a very peculiar form. It is short and broad, with the nasal part short and compressed, and the zygomatic arches much expanded. At first sight it has much the appearance of the skull of *Reithrodon cuniculoides*; but the zygoma is more expanded anteriorly, the nasal region more compressed, and the space between the orbits much wider. That part which is in front of the zygoma is not more than one-fourth of the entire length of the skull; and of the remaining three-fourths the zygoma takes up two-thirds; its anterior root springs out at once laterally in such a manner as to be at right angles with the nasal bones. The bony plate which descends from this part of the zygoma to enclose the ante-orbital foramen is very narrow, so narrow as to be wholly out of sight when the skull is seen from above, and to give this foramen a forward direction instead of opening obliquely upwards as well as forwards, as in all other species of *Hesperomys* which I have seen, with the exception of *H. latimanus* and *H. bicolor*, which resemble the present one in this respect. The upper surface of the skull presents two strongly marked ridges or crests, diverging from a short distance behind the extremity of the nasal bones to the outer angles of the occipital bone.

The upper incisors are somewhat compressed, their anterior surface rounded, but there is a faintly indicated though quite perceptible ridge along the middle of each, and another similar but more strongly marked one at their inner angle. The molars are parallel with each other, and they decrease much less in size from front to back than is usual. The folds of enamel are more numerous than in most, if not all, other species of *Hesperomys* \*.

The lower jaw has the coronoid process very small, but very acute, the condyloid one very long, and rendered strong by an external longitudinal ridge. The descending or angular process is a well-de-

\* The number of primitive cusps in this species is what we usually observe but they are penetrated by small folds of enamel near to their summits, and these are wholly lost sight of in worn teeth. Between these cusps are some small accessory ones, the enamel enclosing which forms no part of the exposed section of the molar until it is much worn. Hence a considerable number of these teeth having had a different amount of wear are necessary for a proper description.

finer projection from what may be termed the axis of the jaw, and having a more downward direction than usual; indeed, it appears as a distinct lobe or process from the lower edge of the jaw.

Length of the head and body .....	5	6
——— of the head .....	1	5
——— of the ears .....	0	9
——— of the fore-arm .....	0	10
——— of the fore foot and claws .....	0	6 $\frac{1}{2}$
——— of the tibia. ....	1	2
——— of the tarsus and toes .....	0	11
——— of the tail .....	5	6
Breadth of hind feet at the base of the toes..	0	3 $\frac{1}{2}$
Length of skull from front of nasal bones to the occipital crest .....	1	3
Breadth across the zygomatic arches.....	0	8 $\frac{3}{4}$
Length of the nasal bones!.....	0	4 $\frac{1}{2}$
——— from point of upper incisor to the front angle of first molar .....	0	4
——— of the molar series .....	0	2 $\frac{1}{2}$
——— of the palate .....	0	2 $\frac{3}{4}$
Breadth of palate .....	0	1 $\frac{3}{4}$
Length of lower jaw from the points of incisors to the condyle .....	0	9 $\frac{1}{2}$
Depth from the coronoid process to the angle	0	4 $\frac{1}{4}$

27. *DASYPUS MINUTUS*, Desm.

28. *DIDELPHYS CALIFORNICA*, Bennett, P. Z. S. 1833, p. 40; Waterh. Nat. Hist. Mamm. i. p. 476.

29. *DIDELPHYS QUICA* (Natterer), Temm. Mon. i. p. 36, 1827; Waterh. Hist. Nat. Mamm. i. p. 480.

Since the preceding report has been written, I have received from Mr. Salvin the following list of additional species, which are contained in a collection subsequently made at Dueñas.

30. *FELIS YAGOUARONDI*, Desm. Mamm. p. 230; Waterh. Zool. Voy. Beagle, p. 16, pl. 8.

31. *MUSTELA FRENATA*, Licht. Säug. t. 42.

32. *DICOTYLES TORQUATUS*, Cuv. Mamm.

33. *TAMANDUA TETRADACTYLA*, Linn. sp.

34. *DASYPROCTA AZARÆ*, Licht. Verz. Dubl. p. 3, 1823; Waterh. Hist. Mamm. ii. p. 387.

*D. punctata*, Gray, Ann. Nat. Hist. x. p. 264, 1842; Cat. Mamm. Brit. Mus. p. 124.

35. CERCOLABES NOVÆ-HISPANIÆ, Briss., sp.  
*Hystrix novæ-hispaniæ*, Briss. Règ. An. p. 127, 1756.

36. CÆLOGENYS PACA, Linn. sp.  
 Var. *C. fulvus* of F. Cuv. An. du Mus. x. p. 207.

7. LIST OF SPECIES COMPOSING THE FAMILY MEGAPODIIDÆ,  
 WITH DESCRIPTIONS OF NEW SPECIES, AND SOME ACCOUNT  
 OF THE HABITS OF THE SPECIES. BY GEORGE ROBERT  
 GRAY, F.L.S., ETC.

(Plates XXXII-XXXIV.)

1. TALEGALLUS CUVIERI, Less. Voy. Coq. i. p. 716.

*Talegalla cuvieri*, Pr. B. Compt. Rend. 1856, t. 38. p. 876.  
 New Guinea (Havre Dorey); Aru Islands.

2. TALEGALLUS LATHAMI.

*New Holland Vulture*, Lath. Hist. of B. i. p. 32.

*Alectura* —, Lath. Hist. of B. x. p. 455.

*Alectura lathamii*, Gray, Zool. Misc. i. p. 3.

*Meleagris lindsayi*, James, Mem. Wern. Soc. vii. p. 473.

*Catheturus australis*, Swains. Classif. of B. ii. p. 206.

*Catheturus cuvieri* (Less.), Bl.

*Talegalla lathamii*, Gould, B. of Austr. v. pl. 77.

*Catheturus novæ hollandiæ* (Lath.), Pr. B. Compt. Rend. 1856,  
 p. 376.

Brush Turkey.

'Wee-lah' of the natives.

Australia.

3. MEGACEPHALON RUBRIPES, G. R. Gray & Mitch. Gen. of B.  
 iii. pl. 123 (adult).

*Megacephalon malao*, Temm.; Wallace, Ibis, 1860, p. 142.

*Megapodius rubripes*, Quoy & Gaim. Voy. Astrol. t. 25 (young).  
 Celebes (Menado).

4. LEIPOA OCELLATA, Gould, Proc. Z. S. 1840, p. 126; B. of  
 Austr. v. pl. 78.

'Marrakko,' 'Marra-ko,' of the natives of S. Australia.

'Ngow-o,' 'Ngow,' of the natives of W. Australia.

5. MEGAPODIUS FREYCINETI, Quoy & Gaim. Voy. Uranie, t. 32.

Juv. *Alecthelia urvillii*, Less. Voy. Coq. i. p. 703, t. 37; Pr. B.  
 Compt. Rend. 1856, p. 876.

Island of Waigiou; Guébé, Boni; Batchian? and Kaisa Islands?



Wolf, del et lith.

M & N. Hanhart, Imp<sup>r</sup>.

MEGAPODIUS QUOYII, (*Juv.*)





J. Wolf, del et lith.

M & N Hanhart, Imp<sup>r</sup>

MEGAPODIUS SEMNWARDTHI. (Jhon.)





J. Wolf, del et lith.

M & N. Hanhart, Imp.<sup>t</sup>

MEGAPODIUS TUMULUS, (*♂ juv.*)



## 6. MEGAPODIUS QUOYII. (Pl. XXXII.)

*Megapodius freycineti*, p., G. R. Gray, Proc. Z. S. 1860, p. 362.

Like the Batchian examples of the former species; but it is of a more slaty fuscous-black, especially on the head, neck, and breast; quills fuscous black; tarsi apparently of a pale horn-colour.

The young (Plate XXXII.) differs from that of the former species in being also more of a slaty black on the head, neck, and breast, and the plumes of the wings sooty black, rather narrowly margined and banded with ochre. These marks are decidedly more prominent in this species than in the young of the last; cheeks and throat ochraceous white; the buff spot on the abdomen appears to be, when first hatched, buffy white.

Gilolo (South).

## 7. MEGAPODIUS FORSTENI, Temm.; G. R. Gray &amp; Mitch. Gen. of B. iii. pl. 124.

*Megapodius freycineti*, p., Temm.

Top of the head, wings, and back olivaceous-brown, tinged with obscure rufous; front, sides of the head, neck, breast, and nape slaty fuscous; abdomen fuscous, slightly tinged with slate-colour. Bill pale horn-colour; feet plumbeous black.

Length 13", wings 8" 3"', tarsi 2" 7'''.

Amboina; Ceram; Banda?

## 8. MEGAPODIUS MACGILLIVRAYI.

Top and sides of the head, back, wings, tail, sides of the abdomen, and under tail-coverts deep olivaceous fuscous, tinged with obscure rufous; neck, nape, some of the lesser wing-coverts, and beneath the body slaty black. Bill dark horn-colour; feet pale (red); claws black.

Length 13" 6"', wings 9", tarsi 2" 2'''.

Louisiade Archipelago (Duchateau Isles and Pig Island).

## 9. MEGAPODIUS LA PEROUSI, Quoy &amp; Gaim. Voy. Uranie, t. 33.

'Passegniat' of the natives.

Ladrone or Marian Islands (Tinian, Guam, and Rotta).

## 10. MEGAPODIUS GILBERTII.

*Megapodius rubripes*, p., Wagl. Isis, 1829, p. 737?

"*Megapodius of small size*," Wall. Ibis, 1860, p. 142.

Top of the head, nape, neck, and wings olivaceous brown, tinged in part with obscure rufous; front, sides of the head, collar round the neck, and beneath the body slate-colour. Bill fuscous horn-colour; feet plumbeous black.

Length 12" 3"', wings 8", tarsi 2" 2'''.

Celebes.

11. *MEGAPODIUS CUMINGII*, Dillw. Proc. Z. S. 1851, p. 118, pl. 39.

Philippine Islands (Manilla); Labuan; Borneo (North-western)?

12. *MEGAPODIUS GOULDII*.

Top of the head greyish-olivaceous brown; back, wings, sides of the abdomen, and beneath the tail rufous-olivaceous brown; sides of the head, neck, nape, and beneath the body slate-colour. Bill pale horn-colour; tarsi pale red; toes blackish, claws black.

Length 11" 6"', wings 8" 3"', tarsi 1" 11'''.

Lombok.

13. *MEGAPODIUS NICOBARIENSIS*, Bl. Journ. A. S. B. xv. pp. 52, 372.

Nicobar Islands.

14. *MEGAPODIUS REINWARDTII*, Wagl. Syst. Av. Megap. Addit. sp. 4. (Plate XXXIII. young.)

*Megapodius duperreyii*, Less. Bull. Univ. des Sci. no. 5. p. 113; Voy. Coq. t. 36.

*Megapodius rubripes*, Temm. Pl. Col. 411; Wagl. Isis, 1829, p. 737; Less. Tr. d'Orn. p. 479.

'Mangoipe' of the Papuans.

New Guinea (Havre Dorey, River Oetanata); Amboina?; Aru and Ké Islands.

15. *MEGAPODIUS TUMULUS*, Gould, Proc. Z. S. 1842, p. 20; B. of Austr. v. pl. 79. (Plate XXXIV. young.)

'Oooregoorga' of the natives.

Australia (North); Islands in Endeavour and Torres' Straits.

16. *MEGAPODIUS WALLACEI*, G. R. Gray, Proc. Z. S. 1860, p. 362, pl. 171.

East Gilolo.

17. *MEGAPODIUS STAIRI*.

*Megapodius* — ? G. R. Gray, List of B. of the Trop. Isl. B.M. p. 46.

Egg dusky white. Length 3" 1"', width 1" 1'''.

Samoan or Navigator's Islands (*Rev. J. B. Stair*, 1847).

18. *MEGAPODIUS BURNABYI*.

*Megapodius* — ? G. R. Gray, List of B. of the Trop. Isl. B. M. p. 46.

Egg pinkish stone-colour. Length 3" 1"', width 1" 9'''.

Hapace Islands (*Lieut. Burnaby, R.N.*).

These two latter species are only known by a specimen of the eggs from each locality having been presented to the British Museum. I have here provisionally placed a specific name for each, having little

doubt that they will prove distinct species from each other, and even from all the other known species.

19. ? *MEGAPODIUS* ? *ANDERSONI*.

*Tetrao australis*, Anders. MSS.

“*Fusca nigraque ; pedibus nudis.*”

New Caledonia.

The name given above (with the very short specific characters) was found among others in the manuscripts of Anderson, who was assistant-surgeon during the third voyage of the famous circumnavigator Cook. Though the description is so short and concise, I am, however, induced to suppose that it can only be referred to a species of *Megapodius*; certainly it cannot be reconciled with any of the present known birds from New Caledonia. I refer to it in the hope that this slight indication may lead to its being searched for by collectors and others who may be located in that island, thus proving whether I am right in my supposition with regard to its being one of this remarkable genus.

The family of *Megapodiidae* is composed of a series of birds which are very remarkable for the extraordinary and anomalous contrivances resorted to by the different species for obtaining the artificial heat that is necessary for bringing their eggs to maturity; and for other singularities in their general habits, &c. The account which follows is principally collected together into one view from different published sources.

These birds are all, with one solitary exception, as far as is at present known, inhabitants of certain localities within the tropics, viz.:—

Nicobar Islands, Lomboek, Borneo (N.W.), Labuan, and Luçon.

Celebes, Gilolo, Batchian, Ceram, Amboina, Banda Islands, Guébé, Boni, and Waigiou Islands.

New Guinea, Louisiade Archipelago, Aru and Ké Islands.

Australia (North, West, and South), Islands in Endeavour and Torres' Straits.

Ladrone or Marian Islands. They are also known to exist in Hapace or Habai Islands, Samoan or Navigator's Islands; and probably in New Caledonia.

They generally inhabit the dense forests, brushes, and mangrove swamps, or jungles of luxuriant vegetation, especially those that border the sea-beach, or rivers and creeks; but others (*Leipoa ocellata*) prefer the sandy districts of the scrub.

Their appearance when walking in open places is stately and somewhat sedate, which may be occasioned by their habit of lifting their feet very high, and of setting their backs up, somewhat like the guinea-fowls. Their extreme shyness and timidity causes them to reside in, or to remain in close approximation to, the thickets, &c., that they may escape, if disturbed, by running (which they do with great quickness) among the vegetation; but should they fail thus to conceal themselves, they then fly on to the lower branches of the trees, where they remain quite motionless, with the neck sometimes

stretched out in a line with the body, or they ascend to the top of the tree by leaping from branch to branch; and should they still be alarmed they will fly off, with a heavy flight, for a short distance, to some other more secure position, where they can only be approached by carefully proceeding under cover of the large trees. It has, however, been remarked that some species have never been seen to perch.

They are often heard uttering at intervals a loud clucking or screeching noise, while they lie concealed beneath the shady branches of the trees during the midday heat. Some have been observed to dust themselves on the sandy ground after the manner of gallinaeous birds; and they have been noticed to be apparently very pugnacious at times, swiftly chasing each other along the ground, and calling to one another more loudly than usual, suddenly stopping, and then again running off in pursuit.

Their food is entirely sought for on the ground; it is obtained by scratching among and turning up the fallen débris beneath the trees and shrubs in the forests, &c., and consists of seeds, fallen fruits, insects, and small snails: but one species is thought to feed chiefly on fallen fruits resembling the cotyledons of leguminous seeds; and rice is also said to form a portion of its food.

The species that form mounds for the purpose of incubation, usually select during the tropical spring a retired and shady place in the dense thickets or brush, occasionally surrounding the trunk of a tree by a portion of the materials employed in its formation, should it come within the prescribed limit of the mound.

The mound is composed more or less of vegetable matter, which becomes decayed and rotten during the period that the birds are engaged in laying their eggs, which is thought to be an occupation of two or three months' duration. The size of the mounds varies with the species; some have been found reaching to 14 feet in height (24 feet from the base of the slope to the summit) and 150 feet in circumference, and some are even larger. The materials required in their construction are collected by the birds by means of their large feet, either by carrying a small quantity at a time in one foot, or by scratching it together with their lengthened claws, and thus leaving the earth bare for some distance round the mound. The mound of some species (*Talegallus*) is entirely composed of vegetable matter; others (*Leipoa ocellata*, *Megapodius macgillivrayi*, *Megapodius tumulus*), however, mix with the vegetable matter earth, sand, gravel, stones, and even, in some cases, fragments of corals; in fact, the birds employ whatever falls in their way at the locality they have selected. The same pair frequent the mound year after year, destroying that of the former year on the renewal of the season for laying; thus the vegetable portion of the centre becomes mixed with the sand and earth that formed the outer part of the former mound. The pair, on renewing the mound, first collect a new mass of vegetable débris for the centre, on which is scratched some of the former material to a certain height, leaving the centre somewhat hollow. It is in the middle, at various depths, from 18 inches to

several feet, according to the habits of the different species, that the females of some species deposit their eggs, in the form of a circle (*Talegallus*, *Leipoa*), while others place them in an irregular manner in separate excavations in different parts of the mound. The eggs are deposited at about sunrise, one by one, at an interval of days between each, reopening the centre on each egg being placed therein, and then covering it again, and returning each time to their usual haunts in the thickets, &c., until all the eggs intended to be laid are deposited. The centre is then completely covered in, and the mound becomes elevated to the height of several feet with the remaining earth or vegetable matter, assuming a conical or dome-shaped form; but the large mound has the top flattened for about 3 feet in diameter. The heat that is engendered by the fermentation of the vegetable matter is thus retained within the mass, and causes the eggs to arrive at the period of maturity.

It is thought that the bird allows the centre to be but slightly covered during the period of laying—for two reasons: first, that it may have the less to scratch away on each visit, and thus be enabled more easily to deposit the egg; secondly, that the eggs already laid may be kept in a cool and certain temperature until all are deposited, while, at the same time, the rain may more readily penetrate through to the vegetable mass, which would hasten the rotting, and thereby raise the necessary heat for the hatching against it is really required.

The mode adopted by the Megapode of Banda (*Megapodius amboinensis*?) differs materially from that of the species above referred to. It is stated that the eggs of this bird “occur isolated and dispersed here and there; but each egg was carefully covered by a mass of fragments of dry plants or leaves.”

Another remarkable difference is exhibited in the habits of the small Celebean Megapode (*Megapodius gilbertii*). This species is observed “to scratch out a hole in the rotten stump or root of a fallen tree, and there bury its eggs;” but nothing is said about covering them with vegetable debris or other matters, which we may, however, suppose them to do, as is exemplified by the other species of this singular family.

There are other species whose habits are still more extraordinary in the selection of places for the incubation of their eggs.

One species (*Megacephalon*), which resides many miles away in the inland forests, and others (*Megapodius freycineti*, *M. cumingii*, *M. nicobariensis*), that live in the jungles not far removed from the beach, seek daily in pairs (often thus congregating in flocks of hundreds at the period of laying their eggs) the sea-beaches, where, in a retired position in the masses of sand thrown up above high-water mark, as well as near the neighbouring jungles, may be observed a number of holes of various diameter scratched in the sand: so rapidly do the birds throw up the sand, that it looks completely like a fountain during the operation. The holes are usually of the depth of 18 inches to 2 feet; in them it is thought that “a number of hens” deposit in succession their eggs, upright in the sand, on the side of the same hole at a distance of a few inches between each.

The number of eggs has been found to vary in the different holes, which may, in some measure, depend on the number of females that visit each. Each egg of the same female must, however, be, as in the former case, laid at an interval of some days; but whether they return to, and lay their eggs in, a hole already formed by a single pair or by several pairs in company on the same day, is not quite determined. Each separate female must, after the hole is made, when about to lay, scratch a place for the egg on the side within the hole, and when deposited must cover it with some portion of the sand which is around it, and thus by degrees the interior of the hole becomes mostly filled in, after which the place of concealment is often betrayed by the birds scratching over it a large heap of such shells and rubbish as they may meet with on the beach. The eggs are then left to be hatched by the heat engendered in the sand through the rays of the tropical sun playing on its surface; probably a longer period for hatching the eggs is required than from the heat caused by the fermentation of decaying vegetable matter, the heat of which is known to be considerable.

Thus, if the preceding statement is correct, the eggs in one hole have been laid and the hatching of them has commenced about the same time; and therefore it may be concluded that, after the necessary time has elapsed, all the young birds are likely to make their appearance about the same period.

It has been previously stated in reference to some of the mound-raising species (*Talegallus*, *Leipoa*), that the eggs are placed by the bird in a circle. The mode thus adopted by the bird is interestingly accounted for by His Excellency Sir George Grey, in the following manner:—After the bird, he says, has deposited the first egg in the sand, leaving from 4 to 6 inches between the lower end of the egg and the layer of dead leaves, it then lays the second egg, which is “deposited in precisely the same plane as the first, but at the opposite side of the hole before alluded to. When the third egg is laid, it is placed in the same plane as the others, but, as it were, at the third corner of a square. When the fourth egg is laid, it is still placed in the same plane, but in the fourth corner of the square, or rather of the lozenge, the figure being in this form . The next four eggs in succession are each placed in the interstices, but always in the same plane; so that at last there is a circle of eight eggs all standing upright in the sand with several inches of sand intervening between each.”

Other species do not regard such mathematical principles in the laying of their eggs, but place them irregularly anywhere within the mound, or in whatever position the several species may instinctively adopt, as previously explained. That they may obtain the heat required to bring them to maturity appears to be the principal object.

It seems marvellous that these birds, after they have taken all these precautions for the preservation and development of their eggs, should exhibit no further care for them, but leave the young entirely to find for themselves their way out of whatever position the females may have placed the eggs in. The young bird, on breaking the

shell, scratches its way out of the heap without any assistance, and when free, just shakes off the material of which the heap had been composed, and then runs off to the thickets, &c., and commences seeking its food without any hesitation, by scratching and turning up the earth or débris that lie on it, like an old bird. Each bird is fully fledged on its first appearance. This latter circumstance has caused some collectors and ornithologists to suppose these young birds to be the adult state of a species; and the idea has occasioned the establishment of the generic appellation of *ALECTHELIA*, with the specific name of *urvillii*, Less. This name has been attached to all the specimens of young birds sent from various localities, though in colour and markings they differ from each other, but retain somewhat of the colour of the parents. Thus, *M. freycineti* and *M. quoyi* are of a sooty-black colour, with the cheeks and throat of a pale ochraceous colour; but the markings differ in each species: the former has the wing-coverts margined, and all the quills banded, with pale ochre-colour; in the latter, however, it is only irregularly banded on the tertials and lower part of the back. On the other hand, the young of *M. reinwardtii* and *M. tumulus* are of a rufous colour; the former has the back of the neck and nape greyish brown, throat ochraceous white, breast and beneath the body greyish ochraceous with a buff spot on the abdomen, quills fuscous, wing-coverts and tertials margined with deep rufous, feet pale. The latter species is very similar, but appears to be more decidedly margined on the wing-coverts and tertials with pale rufous, conveying the appearance of bands; throat rufous ochre; and beneath the body of a somewhat darker colour than in the previous example. These differences between the young and adult birds are so strongly marked, that even Mr. Wallace states, with regard to one sent home by him, that "he is convinced it is an adult bird," "as it is considered to be by the natives of Aru."

The egg is remarkably large when on the point of being laid (measuring from  $3\frac{1}{2}$  to  $4\frac{1}{4}$  inches in length, and 2 to  $2\frac{1}{2}$  inches in width, weighing 8 or 9 ounces); it consequently fills up, says Mr. Wallace, the lower cavity of the body, squeezing the intestines so that it seemed impossible for anything to pass through them; while the ovary contained from eight to ten eggs about the size of small peas, which must evidently require somewhere about the time named (thirteen days the natives assert) for their successive development. A considerable interval, says Mr. Wallace, "must elapse before the succeeding one can be matured. The number of eggs which a bird produces each season seems to be about eight;" so that, if this supposition is correct, "an interval of three months must pass between the laying of the first and last egg."

The eggs vary from white to cream- or pale salmon-colour. Some eggs are often covered with an epidermis of a dirty-brown colour, which easily chips off, exposing the proper colour of the egg.

The birds place the egg upright in their mounds or other places, so that the egg may obtain the heat equally on all sides—as other birds, which sit on their eggs, continually turn them, so that each

side may obtain the same amount of heat from their bodies, which is essentially requisite, or the egg would not be brought to perfect maturity.

The eggs, it is said, "when quite fresh are delicious eating, as delicate as a fowl's egg, but much richer." The natives of the Hapace Islands, either from their rarity or from their great delicacy, look upon the eggs found in their islands as worthy to be reserved for the chief's eating; and for that reason they are denominated "Chief's Eggs." The flesh of the adult bird of some species has been pronounced to be good eating.

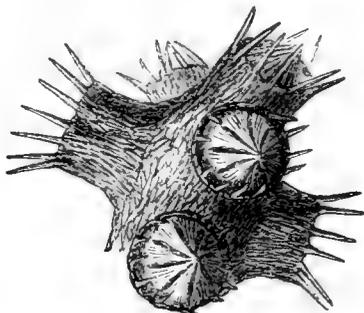
#### 8. DESCRIPTION OF A SECOND SPECIES OF ACANTHOGORGIA (J. E. GRAY) FROM MADEIRA. BY JAMES YATE JOHNSON.

In the 'Proceedings of the Zoological Society' for 1857, p. 128, was printed a description of a new genus of *Gorgoniadæ* by Dr. J. E. Gray, founded on a specimen in the British Museum, the habitat of which was unknown. The genus was named by its describer *Acanthogorgia*, and the specimen was figured, by an inadvertence, in the 'Proceedings of the Zoological Society' for 1851 (*Radiata*, Pl. III. fig. 2), under the name of *Nidalia occidentalis*, instead of *Acanthogorgia hirsuta*, Gray. I am now in a position to state that the native place of this curious Black Coral (of which no notice has been taken by M. Milne-Edwards in his work on Coralliaria) is Madeira; for I possess one specimen, and have seen others, obtained from deep water near that island. Last winter a specimen of Black Coral fell into my hands (also obtained from the same coast), which, though evidently belonging to the genus *Acanthogorgia*, appeared on examination to be specifically distinct from the species previously described. I now proceed to lay before the Society a description of this second species, which I have named, in honour of the founder of the genus to which it belongs,

#### ACANTHOGORGIA GRAYI.

Colour dark brown. Branching irregularly, with a tendency to grow in one plane. Branches free, slender, flexible, having an average diameter of one-seventh of an inch; the thickest part of the stem near the base has a diameter of three-tenths of an inch; the ends of the branches are rounded, and thicker by one-half than the neighbouring portion of the branch. Axis pale brown, very slender, that of the smaller branches, when dry, being not more than the twentieth of an inch in diameter. When the coral has been a few days out of the water, the axis shrinks from the bark, and remains distinct in the middle. It is composed of fibrous matter without spicula. Caustic alkali has little or no effect upon it, even on the application of heat. Bark composed almost entirely of spicula, studded with sessile cylindrical cells, irregularly distributed on all sides. These cells have a height of from the thirtieth to the twentieth of an inch, and their diameter is about half the height. The upper halves of eight (some-

times nine) large erect spicula project round the orifice of each cell at eight angles, corresponding with the same number of slightly elevated ribs or crests on the outside of the cell formed by other spicula; the exposed portion of these projecting oral spicula is smooth. In *A. hirsuta* the exposed portions of the corresponding spicula are

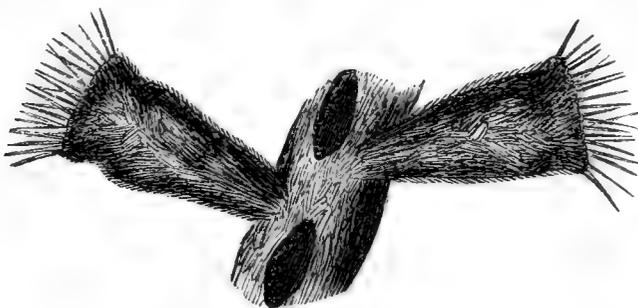


*Acanthogorgia grayi.*

rough. The orifice itself in a dry specimen is covered in by another series of large spicula, sixteen in number, arranged in eight pairs, the apices of which meet in the middle. At the outside of the cells the spicula are placed parallel, not crossed as in *A. hirsuta*.

The spicula are composed of calcareous matter, and are at once dissolved with effervescence on the application of a strong acid, leaving behind a formless mass of brown animal matter. The spicula which lie in the bark between the cells are fusiform, slightly bent, and for the most part very stout, some elongated, others contracted to an ovoid form; those which project round the orifices of the cells have their basal portion geniculate, flattened, and very rough, with protuberances; and not unfrequently the bases are branched. The spicula of both species are pretty objects under an object-glass of low power.

*Acanthogorgia grayi* differs from *A. hirsuta* (of which a figure is



*Acanthogorgia hirsuta.*

here given for comparison) in the much smaller size and in the form of the cells, which are cylindrical, not bell-shaped nor contracted at the

bottom. In the only specimen of the former which I have seen, the cells are not nearly so numerous as in the specimens of the latter which have come under my notice. Moreover, the orifices of the cells in *A. hirsuta* are not roofed in with spicula in the same complete and regular way as is the case with the cell-orifices of this species. Lastly, I have not noticed any branching at the bases of the large spicula of *A. hirsuta*.

The only specimen of this very curious Black Coral which has fallen in my way, and which I have had the honour of presenting to the British Museum, was brought to me when residing at Funchal in the month of February last. It was said to have become entangled in a fishing line, and to have been brought up from a considerable depth near Ponta do Pargo, the south-west extremity of the island. It was attached to a stone on which a small specimen of *Dendrophyllaea ramea*, a not uncommon Madeiran coral, was seated. It has a height of 6 or 7 inches, and it measures about 10 inches across.

#### 9. NOTES ON THE SEA-ANEMONES OF MADEIRA, WITH DESCRIPTIONS OF NEW SPECIES. BY JAMES YATE JOHNSON.

In the following notes I have given an account of such Sea-Anemones as have occurred to me after much diligent search in the neighbourhood of Funchal, the capital of Madeira. The dredge would doubtless bring other species to light, and possibly something additional would be discovered by an examination of the shore in other parts of the island. As to the nomenclature of the genera, I have considered it right to follow Mr. Gosse, to whom all students of this tribe of Zoophytes must feel much indebted for his painstaking book on the British species.

*A Cornularia* is included; for although not, strictly speaking, a Sea-Anemone, it closely resembles one in external appearance.

#### Order ALCYONARIA, M.-Edw.

##### CORNULARIA ATLANTICA, sp. n.

Basal band narrow, inconspicuous, creeping irregularly, and bearing the polypes at uncertain distances. Column of a pale flesh-colour, subcylindrical, rather wider at the middle than above and below; destitute of spicula, but invested by a thin epidermis containing particles of sand; when retracted, forming a fleshy hemispherical button, one-fifteenth of an inch high; when expanded, the column has a length of about three-tenths of an inch, with a diameter of one-twelfth of an inch. Eight pinnate tentacles, in one series, at the margin of the shallow cup forming the disk, the pinnæ of about twelve pairs, ringed, as if showing a tendency to further division. Tentacle-stem subulate, about one-fourth of an inch in length, the bases of the tentacles broadening and coming in contact one with another on each side. When the animal is fully displayed, the ten-

tacles and the upper part of the column are nearly colourless, and have the appearance of a transparent film.

Abundant on stones near low-tide mark ; sometimes attached to sea-weed.

Order ZOANTHARIA, M.-Edw.

Suborder ACTINIARIA, M.-Edw.

Fam. ACTINIIDÆ, M.-Edw.

SAGARTIA PARASITICA, R. Q. Couch, sp.

This species is invariably seated upon shells inhabited by Hermit Crabs, *Cassia sulcosa*, *Dolium perdix*, *Triton nodiferus*, &c.

SAGARTIA AFFINIS, sp. n.

This species is closely allied to the last, and like it is always found upon shells of which Hermit Crabs have taken possession, sometimes in company with it, sometimes alone. Its base is capable of great extension ; and its column rises pillar-like, of a diameter very much less than that of the base. When contracted it will often lie so flat as to be scarcely thicker than a sixpence. The ground-colour of the column is yellow ; and there are five broad, more or less fuscous longitudinal bands, which, when the body is contracted, lie star-like upon it. Sometimes there is an irregular whitish transverse band placed nearer the disk than the base ; and in some specimens a number of white longitudinal streaks have been observed near the base. The inside of the mouth is orange. The disk itself is yellowish, the tentacles grey, numerous, in four or five rows. The average size of this species is less than that of *S. parasitica*, the largest specimens of which I have never seen equalled by any of *S. affinis*. Near neighbours in habit and mode of life as these two may be, I have never observed any passage from one form to the other, although a good many specimens have been met with. It is an eager and voracious feeder, and bears captivity very well. It will sometimes transfer itself from the shell to the bottom of the tank, and after a while, lo ! it is seated on the shell once more, the shell being all the time the abode of a restless *Pagurus*.

PELLIA VESTITA, sp. n.

Base adherent to rocks, less than column. Column cylindrical when expanded, clothed with a dense, brown, closely-adherent skin, rough like wash-leather, which when forcibly stripped off discloses the true skin beneath, which is smooth and of a pinky red. The animal is able to protrude the lower part and the upper part of its column from beneath the epidermal covering, which seems to consist chiefly of mucus and fine mud blended together. In a contracted state it is wrinkled transversely, but not warted. Disk smooth, reddish, with radiating marks of brown and white. Tentacles numerous, in three rows, crowded near margin of disk, of moderate length, the innermost row the longest ; retractile, conical, rather broad at the

base, pale red, more or less ringed and spotted with opaque white : sometimes the dilated bases have a dark neutral-tint band, and below this a white band round them. Mouth not raised on a cone, but sometimes puffed out. *Acontia* emitted sparingly.

This Sea-anemone is able to take considerable variety of shape ; sometimes it is contracted, sometimes swollen out at the middle, and when irritated into a state of complete contraction, it has a very rugose appearance. When detached from any support, I have seen it contract its base so much that a small hole only was visible. It has the power of expanding or distending both the lower and upper parts of its body, the expanded portions becoming semitransparent, and assuming the appearance of bladders, whilst the rest of the column retains its rough opaque coating. This coat adheres so strongly, that I have in vain endeavoured to remove it with my finger-nail from a healthy animal. From a specimen, however, which had been severely wounded in removing it from its native rock, I succeeded in peeling off the coat in patches. The animal is not timid, it will keep its tentacles expanded until it is touched ; but in the day-time it seldom pushes them out to their full stretch ; they are usually held curved over the margin of the disk. It is rather fond of ascending the side of the tank until it nearly reaches the surface of the water ; then, attaching itself by part of its lower disk, it will bend its body loosely downwards at an angle of  $45^{\circ}$ . It is hardy in the aquarium, rather sluggish in its habits, and adheres firmly to its support. It is not uncommon under stones in pools amongst the rocks covered at high tide. The size is not great ; the largest I have seen measured about half an inch in height when contracted, and expanded to a length of about an inch and a half.

#### *AIPTASIA COUCHII*, W. P. Cocks, sp.

Not very common : usually found under loose stones near the level of low tide. It preserves at Madeira all the chief characters and habits possessed by its British sisters—restlessness of disposition, flexuosity of tentacles, power of lengthening and contracting the column, love of attaching itself to the side of the tank near the surface of the water, the column hanging downwards with the disk and tentacles widely expanded ; lastly, eagerness in seizing and swallowing its food. Sometimes it will abandon all support and suspend itself freely in the water, base uppermost, remaining thus for several hours without moving, save in being continually employed in distending the column laterally. The distention began to show itself at the disk, and travelled slowly along until it reached the base ; when this had been effected, the animal stretched itself out and then recommenced the operation. One of my specimens, now living in a glass of sea-water, presented itself one day as a globular vesicle three-quarters of an inch in diameter. The disk and tentacles had been retracted, and the tips of some of the latter were just visible at the bottom of a depression resembling that seen at the top of an apple.

— *ANTHEA CEREUS*, Johnston.

This species is by far the most abundant of the Madeiran *Actinaria*, being found in almost every pool on the rocks between tide-marks. It is undoubtedly the animal described in Dana's great work under the name of *Actinia flagellifera* (*Comactis flagellifera*, M.-Edw.).

*ACTINIA MESEMBRYANTHEMUM*, Ellis & Sol.

This species stands next in regard to abundance. The commonest variety is coloured a red-purple, with numerous black dots on the column. Sometimes the spots are greenish grey, sometimes the marginal spherules are red-purple instead of being azure. The animal is frequently of an umber-brown; and a few specimens have occurred which had a brown body and disk, with red-purple base and tentacles. Two specimens have been met with which had a dull-green body and tentacles, with a white base, blue marginal spherules, and a blue line at the junction of the column with the base. At the time I possessed these two *Actiniae* a third specimen was obtained, slightly different from them; and this was placed in the same glass. On looking at them after the lapse of a few hours, I found that the new comer was in contact with one of the others, and that six of the marginal spherules of the latter on the side of contact had expanded into large, colourless, ovate vesicles, retaining only their original blue colour at the tips. The upper part of the body of the animal was separated at this time from the tentacle-bearing disk by a deep fosse. Subsequently more of the blue tubercles expanded, until ten in this state were counted; after a while the disk expanded laterally, the vesicles contracted, and the fosse disappeared. Whilst the vesicles existed, the tentacles in their neighbourhood became much reduced in diameter, so as to be filiform. I am not aware whether a similar phenomenon has been observed by others.

*ACTINIA VIRGATA*, sp. n.

Base of a deep flesh-colour, adherent to stones, not much exceeding the column when the tentacles are expanded; when these are withdrawn and the column is depressed, it frequently spreads out into an enlarged irregular oval. Column delicately smooth, imperforate, non-adhesive; substance fleshy, marked by numerous (45 to 50) pairs of straight, purplish-blue lines, which extend from the margin of the disk to the angle of the column and base, where there is a circumferent line of the same colour. Each of these lines is about half as wide as the space between any two; sometimes a line is broken up into dots. When the animal is in a contracted state, the lines are brought so close together, and their colour so deepened, that it appears nearly black. The disk has the margin closely set with azure tubercles, about thirty in number; it is smooth, of a pinkish flesh-colour, often puffed out into a cone, at the top of which is the mouth. Tentacles about eighty in number, crowded in three or four rows, placed near the margin of the disk, moderately long, with little differ-

ence between dimensions of those in the several series, conical, of a pale-brown colour, with a slight purple tinge. When contracted, of a dark sepia-brown. Mouth with an azure-blue spot at the opposite angles. *Acontia*, none observed.

Size from half to three-quarters of an inch in height, and from one-third to one-half an inch in height.

Found on the underside of stones in pools near low water-mark.

This pretty species is not very common: it is of very quiet habits, and dislikes the light. When in the aquarium it hardly ever expands its tentacles in the day-time, and at night, if brought within the influence of light, the animal immediately takes alarm. A specimen is now living in one of my tanks. A few days ago, on looking at it after an interval of four or five hours, I found, to my surprise, that it had in the meantime surrounded itself with a progeny of fourteen young ones, the average size of which was one-tenth of an inch in height and diameter, though some were smaller and some nearly twice as large. They were of a dull flesh-colour; but on the larger ones the purplish-blue marks began, in the course of a few hours, to show themselves as rows of dots, with irregularly arranged dots filling up the spaces between the rows of each pair. Some of them displayed their tiny tentacles in a ludicrously old-fashioned manner. As to the mother, she had contracted her tentacles until they were little more than papillæ; the disk was puffed out much beyond their tips; and the mouth was gaping widely, displaying a red throat; the base was quite free, and was altogether concealed by the contraction of the body.

#### BUNODES LISTERI, sp. n.

Base adherent to rocks; its diameter about equal to the height of the column. Column, when expanded, usually from half to three-quarters of an inch in height; but one specimen extended itself to the length of an inch and a third, with a diameter of four-tenths of an inch. Surface red, beset with longitudinal rows, about twenty-four in number, of small white tubercles, which have a spot or streak of red at their apices. There are from ten to sixteen tubercles (taking different specimens) in a row; these tubercles can be employed as suckers, and by them I have seen the animal adhere to the bottom or side of a glass in which it was living; the alternate rows sometimes cease with the third or fourth from the disk. Disk frequently cup-like, without marginal spherules, very transparent, with a row of small white spots at the inner base of the innermost series of tentacles: sometimes there are white spots between the tentacles. Margin of disk uneven, by reason of the highest tubercles of the column forming part of the outline. Mouth with a pale ring around it. Tentacles numerous, in about three rows near the margin of the disk, those of the innermost row longer, and these are as long as the diameter of the column, decreasing in size outwards, pale flesh or brown, but sometimes bearing white opaque spots, very pellucid, conical, simple, readily retractile, and usually brown, curled at the tips.

This pretty species is very distinct from all the other Madeiran

species that have occurred, but it seems to be closely allied to the British *Bunodes ballii*. The pale-red, diaphanous tentacles become in some cases, when contracted, of a red-purple colour, in others of a brown hue. In one specimen, which was brought to me much wounded, the red tubercles of the column were ringed with greenish yellow. The animal is rather impatient of light, and is only seen fully expanded at night. It adheres very firmly to the object it is seated upon, and will submit to be torn rather than loosen its hold.

I have named this species in honour of Dr. N. Lister, of Funchal, to whom I am indebted for much sympathy and assistance in my investigations.

#### ALICIA, gen. n.

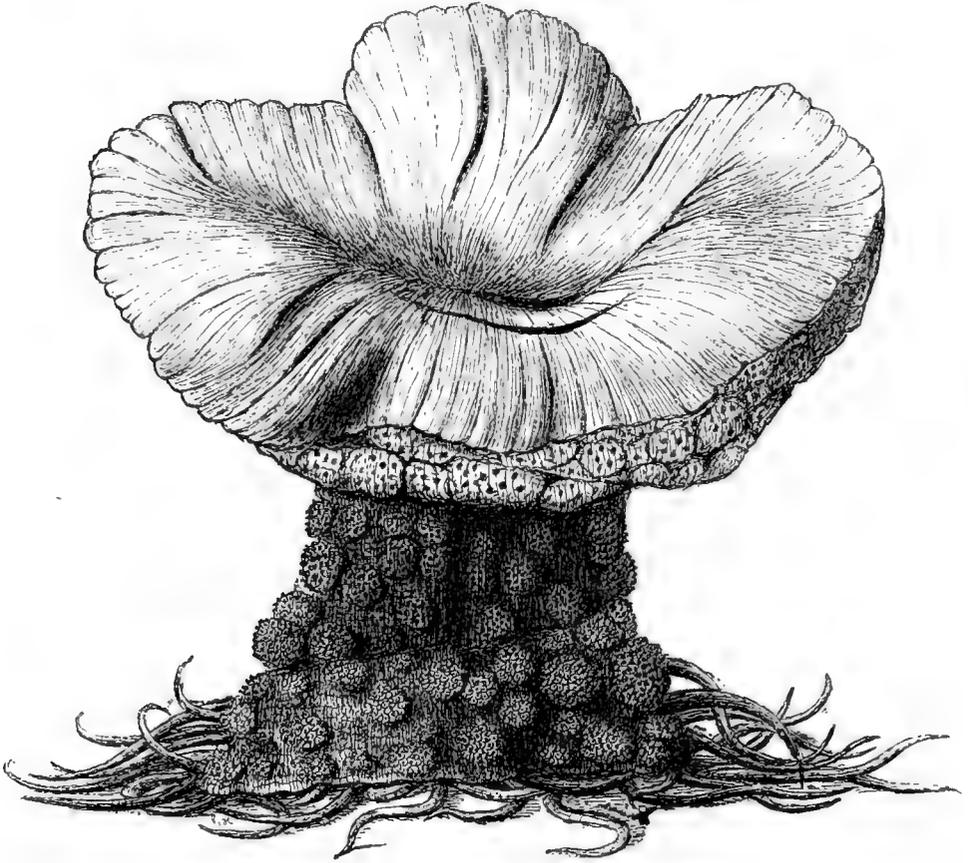
Base adherent at pleasure; greatly exceeding column. Tentacles simple. Margin of disk simple, without spherules. *Column beset with stalked appendages.*

#### ALICIA MIRABILIS.

Base pale brown, adherent apparently by means of minute round suckers scattered over it, capable of great dilatation, and sometimes having a diameter of between 4 and 5 inches; very transparent, so that the appendages on the column could be seen through it. The outline undulate; the surface marked with about a hundred radiating furrows, meeting in the middle, and causing the margin to be crenate. Column apparently imperforate, pillar-like, when fully expanded measuring  $2\frac{1}{2}$  inches in height and diameter; surface delicately soft, pellucid, pale brown, marked with longitudinal furrows corresponding with those on the base; beset with stalked appendages. At the base these appendages are small, nearly sessile, and bear at their summits a single wart of hemispherical outline and of a dull-purple hue; they become larger in proportion to their height above the base, until those next the oral disk have stalks half an inch high and  $\frac{3}{10}$  of an inch in diameter, which divide and redivide, each ultimate division always crowned with a wart. As many as sixty warts might be counted on one of these appendages, the appearance of which when half-contracted, had some resemblance to a head of cauliflower. In most cases the common stalk was of an opaque white colour, but in other cases it was orange; and there were two of this colour standing higher up the column than the rest, and placed over against each other. When the animal was in its greatest state of contraction, no part of the column was visible, on account of the warted tops of the appendages forming an unbroken coat; when fully expanded, the soft delicate body was seen between the separated appendages, and the upper part near the disk was extended quite clear of them for a considerable space. Under the microscope the purple warts were seen to consist of an exterior, transparent, colourless coat enveloping a body which was purplish at the tip and pale brown below. Disk destitute of marginal spherules, not lobed nor extending beyond the column, pale brown, transparent, slightly cupped. Tentacles pale brown, simple, subulate, elongated, rather slender, often

curled, numerous, compactly set in three rows near the margin of the disk, beset with minute papillæ. Mouth half an inch across; lips usually somewhat puffed out, and divided by deep furrows into six longitudinal ribs on each side; destitute of warts and tentacles. Throat of a pretty full brown. No acontia observed.

1



4



2



3

But one specimen of this very curious animal has occurred; it was brought to me alive in the month of April last, and was said to have been found in one of the cane-work baskets which are sunk to the depth of a few fathoms in the Bay of Funchal, chiefly for the purpose

of taking Red mullet (*Mullus surmuletus*, L., and *M. barbatus*, L.). When I first saw it, only just covered with a little water, it was in a contracted state, and my first impression was that a compound Ascidian was before me. After keeping it for three weeks in a small tank, I attempted to bring it with me to England in order to show it to those interested in this tribe of animals; but being unfortunately unable to attend to it in the earlier part of my voyage, it perished, to my great regret.

As to its habits during the time it lived in my tank, I may say that it bore confinement very well, and took its food (the flesh of *Patellæ*) with considerable readiness. It frequently shifted its position in the tank, and on one occasion it was seen floating base uppermost; when attached, its upper part was seldom destitute of motion, but that motion was exceedingly slow. The tentacles were usually more or less displayed; but it has been observed with them so completely withdrawn that it was not easy to discover the precise situation of the disk and mouth. The tentacles possessed the power of stinging; but, though the skin was made red, the pain was not great.

Fam. CERIANTHIDÆ, M.-Edw.

SACCANTHUS MADERENSIS, sp. n.

Column lengthened, worm-like, with a conical *imperfurate* base; skin smooth, apparently without suckers or loopholes; of a pale chestnut-brown colour; enveloped in a loose non-adherent tube secreted by the animal, open at both ends. Disk without marginal spherules, cup-shaped, capable of being expanded so as to have a diameter twice that of the column. Tentacles of two kinds: 1st, marginal, twenty-four in number, in one series, but often arranged, when fully displayed (and then bending inwards and outwards alternately), so as to have the appearance of being placed in two rows; these tentacles are slender, tapering, uniform, longer than the diameter of the column, and are coloured brown with pale rings: 2nd, short filiform tentacles, about twenty-five in number, arranged in two or three irregular circles round the mouth, coloured a uniform brown; these labial tentacles hardly equal in length the radius of the disk.

Only one specimen of this interesting animal has fallen in my way. When first brought to me, its appearance was that of a mass of dirt which had a certain convoluted shape, and out of which protruded at one place a reddish semitransparent body (the base), and at another some tentacles, which partly folded up on being touched. At first sight I took the animal for an Annelid; but during the night it shuffled off its muddy coating and displayed itself in its true character. It was then seen to have a length of about  $2\frac{1}{2}$  inches, with a diameter of about a quarter of an inch. The column was quite smooth, cylindrical, and of a brown colour approaching to auburn or chestnut. When examined with a lens, some fine longitudinal lines were perceived, dividing the body at regular intervals, and about  $\frac{1}{10}$  of an inch apart. Faint angular transverse lines were also visible, pretty closely set. It seemed shy, and never expanded its tentacles completely,

except in the dark, when it contracted them if the light of a candle fell upon it. The power of fully withdrawing them seemed to be wanting. They were more than an inch in length when entirely displayed. The next day I perceived it lying in the angle at the bottom of the glass containing sea-water, enveloped in a glaucous semitransparent film of mucus looking like a stout spider's web, in which it moved as a worm moves in its case. It had expanded to a length of  $4\frac{1}{2}$  inches, but on being touched immediately contracted so as to measure only  $1\frac{3}{4}$  inch. It possessed the power of swelling out portions of the column; sometimes the swelling appeared near the middle of the body, sometimes near the base. On some occasions it lay with the lower part of the body bent into a hook; at others it quitted the protection of its tube and floated at the surface of the water. The animal was never observed to wriggle or glide through the water like a worm; all its motions were extremely slow. It was captured at the bottom of a pool in the rocks near Funchal.

DESCRIPTION OF THE WOODCUT, p. 304.

- Fig. 1. *Alicia mirabilis*, as seen with the base detached and uppermost, the tentacles lying on the bottom of the tank.  
 Figs. 2 and 3. Two of the appendages of the column, of the natural size.  
 Fig. 4. One of the warts of an appendage, enlarged. The outer coat is colourless and transparent; the top of the interior body is dull purplish, the lower part yellowish brown, and the interspace colourless.

---

November 12, 1861.

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

Dr. P. L. Sclater exhibited a cast of the skull of the Aye-Aye (*Chiromys madagascariensis*), taken from a specimen in the possession of M. E. Verreaux, of Paris, the fourth example of this rare Mammal received in Europe.

Mr. S. Stevens exhibited a portion of the collection of birds recently forwarded by Mr. Wallace from Mysol and Waigiou, amongst which were many rare and interesting species.

The following extract from a letter addressed to the Secretary by Edward Blyth, Esq. (Corr. Memb.), dated Maulmein, May 10th, 1861, was read to the meeting:— \*

“I have made this day a grand discovery, which neither you nor others will believe in at the first announcement, but it is true nevertheless,—viz. that the extraordinary Rhinoceros-horn figured \* as

\* See P. Z. S. 1854, p. 250.

that of *Rhinoceros crossii* by Gray, in your 'Proceedings,' is the well-developed anterior horn of an old male *R. sumatranus*—the common species of these provinces. My host at this place is a great sportsman, and some noble trophies of the chase hang in his verandah; but what fixed my attention was the head of *R. sumatranus*, with a development of horns which I had never imagined to occur in this species; and the resemblance of the much-curved anterior horn to that of Gray's supposed species, *R. crossii*, struck me at once. Conversing with my host on the subject, he remarked that he took a similar head to England (where it now adorns his family hall), with the front horn at least 3 inches longer, and still more curved. A little reflection, and I felt satisfied that *R. crossii* must sink into a synonym of *R. sumatranus*."

In a subsequent communication Mr. Blyth remarked :—

"All doubts now removed about the identity of *R. sumatranus* and *R. crossii*. Mason states that the skin of the Tenasserim species 'is quite smooth, like a buffalo's'—meaning devoid of folds; but Col. Fytche assures me that the one he shot had the slight folds described and figured of *R. sumatranus*. The mature female horns are small, and the nasal bones comparatively narrow; I am not aware that a corresponding sexual difference occurs in any other Rhinoceros. In the Indian one-horned species the sexes are alike in size and development of horn."

The Secretary reported the return from the Cape, on the 1st instant, of the Society's collector, Mr. James Benstead, with a second collection of animals presented to the Society by His Excellency Sir George Grey, K.C.B., the Governor of the Colony. The collection consisted of the following :—

#### MAMMALS.

1. A young male Hartebeest (*Antilope caama*).
2. A female Reh-bok (*Antilope capreola*).
3. A four-horned Sheep (*Ovis aries*, var.).
4. A male Ratel (*Mellivora ratel*).

#### BIRDS.

5. One male and two female Ostriches (*Struthio camelus*).
6. Three Stanley Cranes (*Grus paradisea*).
7. Two Jackal Buzzards (*Buteo jacal*).

The Hartebeest was of great interest, as having been only exhibited once before in the Society's collection. The Ostriches, being from the Cape, afforded an opportunity of comparing together the northern and southern birds, which had long been desired, and which would probably lead to their being distinguished as different local varieties, if not as species.

The following papers were read:—

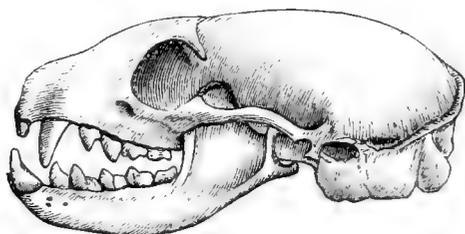
1. NOTICE OF HELOGALE, A NEW GENUS OF VIVERRIDÆ.  
BY DR. J. E. GRAY, F.R.S., V.P.Z.S., F.L.S., ETC.

In making out a list of the skulls of the animals in the Museum, Mr. Edward Gerrard called my attention to a peculiarity in the skull of some of the smaller African Mangoustes. They are externally like the true *Herpestes*, but they want the smaller false premolar teeth in the upper jaw, which are always to be found in the true species of that genus. I propose to designate the group *Helogale*, which may be thus characterized:—

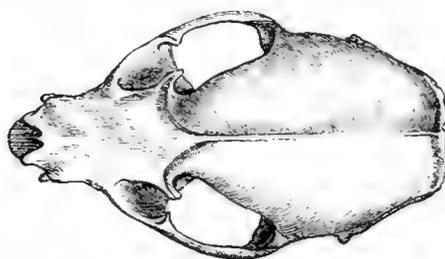
HELOGALE.

Cutting teeth  $\frac{3-3}{3-3}$ ; Can.  $\frac{1-1}{1-1}$ ; Premol.  $\frac{3-3}{3-3}$ ; Mol.  $\frac{2-2}{2-2}$  = 36.

Body slender; head oval; ears distant; toes 5—5; claws com-



Skull of *Helogale parvula* (side view).



Skull of *Helogale parvula* (upper surface.)

pressed, acute; soles of hind feet half bald and callous; tail hairy, tapering.

1. HELOGALE PARVULA (*Herpestes parvulus*, Sundeval).

Skull broad.

*Hab.* Natal.

2. HELOGALE TÆNIONOTA (*Herpestes tænionotus*, A. Smith).

Skull elongate.

*Hab.* South Africa.

The skull differs considerably in shape from that of the species of true *Herpestes*.

2. NOTICE OF A NEW SPECIES OF PILOT-WHALE (*GLOBIOCEPHALUS*), FROM THE COAST OF DORSETSHIRE. BY DR. J. E. GRAY, F.R.S., V.P.Z.S., ETC.

In 1853 the British Museum received the skull of a Cetacean which was dredged up at Bridport, on the coast of Dorsetshire, from the Rev. John Beecham, of the Wesleyan Mission Board. It is evidently a species of *Globiocephalus*; but on comparing it with the skull of *G. vineval*, the Common Pilot-Whale, and other species of *Globiocephalus* which have come under my observation, it appears to be quite distinct from them, and, as I believe, of a species that has not before been noticed.

It is evidently the skull of a large animal, being nearly as large as that of the Common Pilot-Whale; but it is at once distinguished from all the other species of that genus by the convexity of the palate and the oblong form of the nose of the skull, which is nearly of the same width for the greater part of the length, and is regularly rounded in front; while in *G. vineval* it gradually converges from the notch to the apex, and the palate is quite flat, especially in front; and this is the case with all the other species of the genus.

*GLOBIOCEPHALUS INCRASSATUS.* Thick-palated Pilot-Whale.

Teeth  $\frac{9-9}{0}$  or  $\frac{10-10}{0}$ ; the nose of the skull attenuated, the side nearly parallel, and regularly rounded in front; the palate very convex, especially in the front; the upper surface of the intermaxillars rugose in front.

*Hab.* British Seas, Bridport (*Rev. J. Beecham*, 1853).

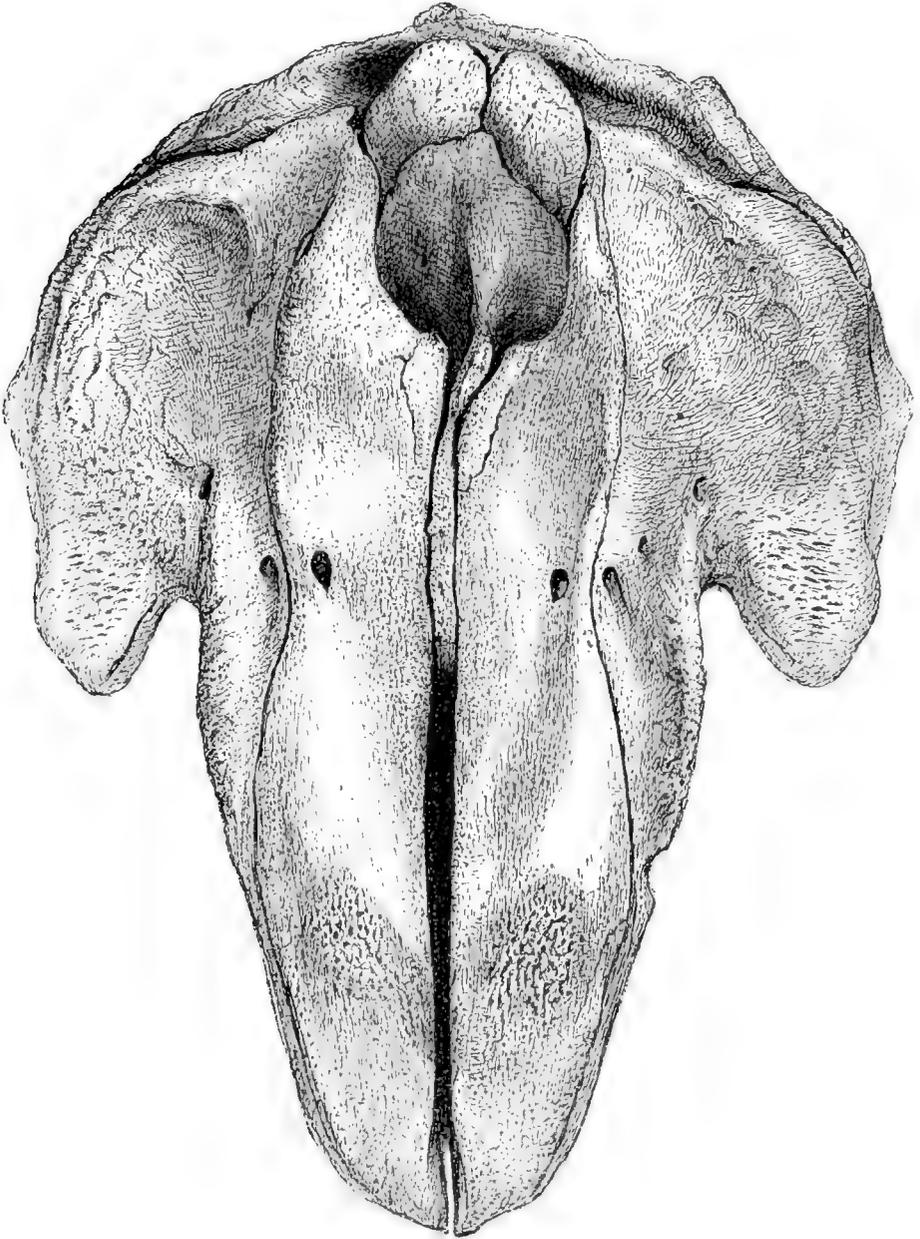
	inches.
Length of the skull . . . . .	28
—— of the nose . . . . .	14
—— of the teeth . . . . .	8? imperfect, worn at the end.
Width of nose at the bridge	10
—— of nose at the under .	$9\frac{1}{2}$
—— of skull at orbits . . .	17

The back of the skull is higher and much narrower than in the skull of *G. vineval*. (See woodcuts, pp. 310, 311.)

This species does not appear to have been observed before as British, and I do not find any indication of its having been described as an exotic species. But it is so distinct both in the form of the nose of the skull, in the width of the intermaxillary bones, and more especially in the thickness and convexity of the palate of the front part of the skull, from the species that has hitherto been described, and the differences are so visible, that Mr. Edward Gerrard selected it as a distinct species as soon as he saw it.

It has been suggested that this may perhaps be the other sex of the common Pilot-Whale (*Globiocephalus vineval*); but I can scarcely think this probable, as I have seen many skulls of the latter, and they have been all nearly similar and very unlike the one under consideration; and I can scarcely believe that all I have seen could have

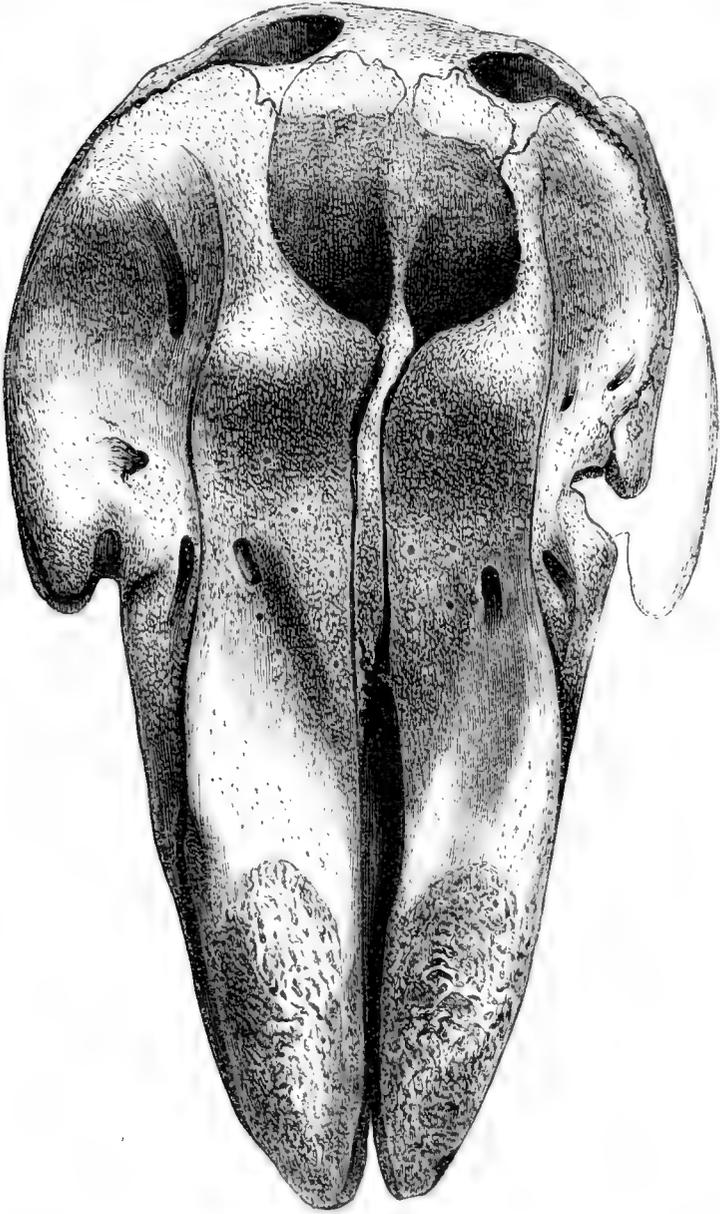
been of the same sex, for it is a Whale that comes on the coast in great shoals, and hence one of its names is the "Social Whale," and



Upper surface of the skull of *Globiocephalus svinival*.

specimens of both sexes have been recorded as caught on the British coast. At the present moment there is an inclination to regard some

of the Whales which have been considered species as mere sexes of the same species, simply because the specimen described in one case



Upper surface of the skull of *Globiocephalus incrassatus*.

happens to be a male and in the other a female. Thus *Delphinus micropterus* is said to be the female of *Ziphius sowerbiensis*, for the above reason ; but I have not heard that any new specimen has been

discovered, or any fact eliminated, to prove the truth of this suggestion, and it may be only an instance of accidental coincidence—

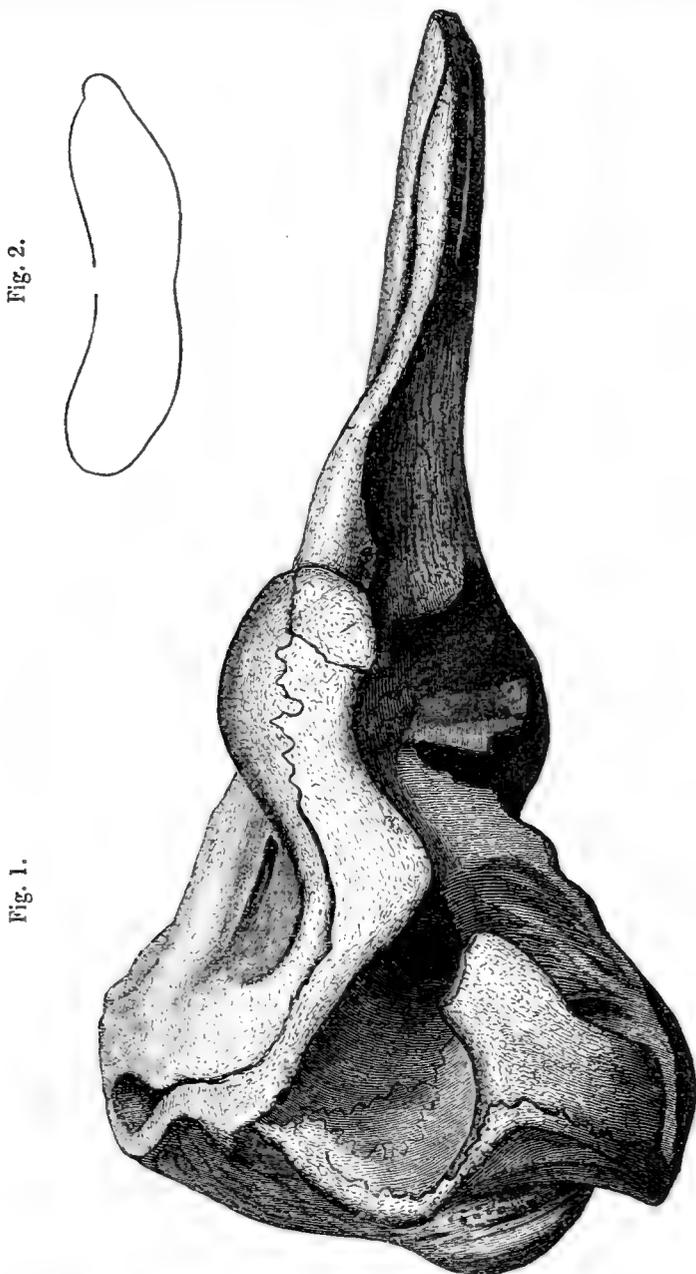


Fig. 1.

Fig. 2.

Fig. 1. Side view of skull of *Globiocephalus incrassatus*.

Fig. 2. Diagram of the cross-section of the palate of *G. incrassatus*.

such a case as may be disproved by the next discovery of either animal.

In the same manner Professor Eschricht, of Copenhagen (and no one has studied the Whales of the North Sea with greater earnestness and success), regards *Hyperoodon latifrons* as the male of the old well-known *Hyperoodon rostratum*, because his specimen of the former belongs to a male, and that of the latter to a female specimen; and he exhibits them side by side as sexes of the same animal in his Museum (see Ann. and Mag. Nat. Hist. 1852, ix. p. 281). Now this is an evident mistake, arising from mistaking an accidental coincidence for an established fact.

The specimen from which the skeleton of *Hyperoodon latifrons* was derived, that is in the Museum of the College of Surgeons in Edinburgh, was a *female*, which was taken on the 24th of October, 1839, accompanied by a young male, in the Frith of Forth. Therefore there are female as well as male specimens known of *Hyperoodon latifrons*, which is regarded by Professor Eschricht as the male of the more common *H. rostratum*, of which I have also seen males as well as females, as recorded in my paper on this subject in the 'Proceedings' of the Society for November 1860.

### 3. ON A LARGE SPECIES OF TEREDO, SUPPOSED TO BE THE ANIMAL OF THE GENUS FURCELLA, LAMK. BY DR. J. E. GRAY, F.R.S., V.P.Z.S., F.L.S., ETC.

In a former communication to the Society on the genus *Furcella*, I came to the conclusion that the animal of that genus was destitute of any shelly valves, because on examining the tube of a young specimen in a very perfect state, that contained in its cavity the two palettes of the animal, it had no appearance of valves, which I supposed would be of too large a size to have escaped out of the tube, more especially as the palettes were in it, which were of a much smaller size and more slender character than the valves were likely to be, and the tube had all the appearance of the animal which formed it having been eaten out by the larvæ of *Muscidæ*, as the skins of the larvæ and pupa-cases were found in the tube with the palettes.

But this shows the danger of coming to any conclusion without one has the actual specimen before one; for we have lately received from Mr. Jamrach, along with a number of Fishes, Reptiles, and other animals in spirits, chiefly from the Dutch Colonies of the Indian Ocean, two specimens of a large species of true typical *Teredines* in spirit, without their shelly tube, but with their palettes attached, which seem to be very probably the animal of the genus *Furcella*.

The reason why I believe them to be the animal of that genus is, first, their large size, which is quite sufficient to form a tube as large as the younger specimen of the genus *Furcella*, and, secondly, the form and size of the palette, which agree in general character with those which were found in the tube of *Furcella*, and which are figured in the 'Proceedings' of the Society for 1857, p. 243, Mol-

lusca, pl. XXXIX. f. 3. Yet there is just that amount of difference between the palette of these animals and those found in the young specimen of *Furcella* which prevents one from saying that the animal is absolutely the animal of the *Furcella*.

The palettes of *Furcella* were slender, cylindrical, with a dilated tip like a double-headed hammer, like the young palette of *Teredo malleolum* of Turton, but of a much larger size; and they had a small, slightly-raised tubercle on the middle of the inner side of the dilated end.

The palette in the two specimens of *Teredo* which we have lately received is of precisely the same form, and nearly of the same size; but instead of having this small tubercle, the middle of the dilated end is produced into an elongated process about half an inch long, which is more slender and oblong at the base, thicker, flattened, and dilated above, and truncated at the top.

The valves of the shell are exactly like those of the *Teredo navalis*, *T. norvegicus*, and other normal species of the genus, but larger.

I am inclined to name this species *Teredo furcelloides*; for I do not think it would be safe to decide, without further evidence, that it is the animal of *Furcella*, Lamk.; but at the same time I consider it right to bring the occurrence of this animal at once before the Society, as it has led me to doubt if my conclusion was correct that *Furcella* is a genus of Conchiferous Mollusks without any valves, as I was inclined to believe before the animal occurred, and which the evidence then before me led me to believe was a correct conclusion.

The palettes are situated at the hinder end, just within the edge of the mantle, the siphons being quite distinct from or within their base. The siphons are slender, of nearly equal diameter, and united nearly to their tips; in their contracted state they just reach to the dilated part of the palette at the base of the terminal elongated process. These are some fragments of a thin lamina of shell attached to the hinder end of the mantle near the base of the palettes.

If this should prove to be the animal of *Furcella*, or even of a *Furcella*-like *Teredo*, it shows most conclusively that the cup at the end of the tubes cannot be regarded as the analogue of the true valves of the genus, as I have also proved in a former paper (see Proc. Zool. Soc. 1858, p. 258).

If these animals prove to belong to the genus *Furcella*, as I suspect they may, then that genus or group of species will only be separated from the other *Teredines* by the habit of living in sand, by the club-shaped form of the tube closed at the end with two arched plates, the division and separate prolongation of the tubes of the siphonal aperture, and the hammer-like form of the palettes.

#### 4. ADDITIONAL OBSERVATIONS ON THE GENUS CUSCUS.

BY DR. JOHN EDWARD GRAY, F.R.S., V.P.Z.S., ETC.

In the 'Proceedings' for 1858, p. 100, I gave some observations on the genus *Cuscus*, with the description of a new species; and

in the volume for 1860, p. 1, I described another species of the genus.

Since that time we have received several other specimens from Mr. Wallace, and I have also been able to examine several other examples sent home by the same excellent collector; and the examination of these specimens has induced me rather to modify my views as regards the species, and has enabled me to observe other characters for the species which were before unknown to me.

I therefore lay before the Society these additional observations, in the hope of doing something towards settling the species of this very difficult group of animals, which are curious as being the only Marsupials that have as yet been submitted to a kind of domestication; though I have never been able to see why Kangaroos might not have been domesticated by the Australian emigrant, except from the difficulty of making them adopt new ways even in a new country.

I may observe that I believe the British Museum contains the largest and finest collection of the specimens of this genus that has been ever brought together. A few years ago we considered ourselves fortunate in having two specimens; now we have thirty-three from very different localities, and I have besides these examined about half as many more.

The zoologists of the modern school are very desirous that the name of the original namer of the species should always be inserted after the specific name, to show to whom belongs the honour of having first named the species,—often a very doubtful source of congratulation or proof of scientific attainment, as for example in this genus.

Should the various varieties of colour really be proved to be good species in this genus, we shall have to adopt the names of Lesson, an author who seems only to have seen a very few specimens, and to have given a name to each of those that he saw, without giving himself the trouble to discover what were the characters that separated them from the other examples of the genus; and it is often the case, not only with species but with genera, that the man who first gives the name to either one or the other often knows less about them, and takes less trouble to study the subject, than men who have never given a new name to either genus or species. This was specially the case with Swainson, who has given the names to many genera of shells and birds even on the slightest characters, and without the least analysis.

In the former paper I divided the *Cusci* into two sections, according to the hairyness and prominence of the ears; I will now divide them into four sections, according to the form of the skull and the number and disposition of the anterior false grinders, and thus place at the disposal of the student two means of determining the species.

Sect. I. The nose of the skull short, broad, and rounded. The anterior conical false grinders one on each side, large, and nearly filling up the short diastema. The grinders large, in an arched series, con-

verging behind. The forehead of the skull rather swollen over the front, and depressed between the hinder part of the orbits. Ears hidden under the fur. Fur of one colour. EUCUSCUS.

1. CUSCUS (E.) URSINUS, Gray, P. Z. S. 1858, p. 103.

Temm. Monog. t. 1. f. 1, 2, 3 (adult), t. f. 1-5 (half-grown) (skull), t. 4 (skeleton).

Blackish; tail and rump dark, like back.

*Hab.* Celebes (*Temm.*).

The three skulls, of different ages, all show only a narrow linear space between the upper edges of the masseter muscles. The forehead of the youngest specimen is not so concave as that of the two older ones.

We have an adult and half-grown female from Celebes, obtained for the Leyden Museum in 1843; and a nearly adult specimen without any distinct indication of its sex—probably a female—with the pouch sewed up, from the Zoological Society, 1855.

If this should be the case, we have only female specimens of this genus; but I believe they have a male at Leyden.

2. CUSCUS (E.) BREVICAUDATUS, Gray, P. Z. S. 1858, p. 102.

Pale brown; the tail and rump of the same colour as the back.

*Hab.* Cape York (*Mr. Macgillivray*).

The skull, which is that of a very young animal, is more like that of *C. ursinus* than that of any other species in our Collection.

The canines are close to the cutting-teeth, and with a very small space between it and the first grinder. The skull is rather convex, and swollen in front over the orbits.

We have only the young specimen and its skull, on which Mr. Gould established the species. It seems very distinct from *C. ursinus*.

Sect. II. The nose of the skull rather produced, rounded. The anterior conical false grinders one on each side above, moderate-sized, near the middle of the broad diastema. The grinders in a slightly arched series. The forehead very convex, and rounded over the middle of the orbit, and flat behind. The ears hairy outside, hidden in the fur. The fur more or less variegated. Tail pale or yellowish. Dorsal streak none. SPILOCUSCUS.

The skulls which we have of the animals of this section show that there are probably two distinct species. One species has grinders of a rather larger size than those of *C. ursinus*, but differing from them in being in only a slightly curved line, the three first grinders forming a series of from 10 to  $10\frac{1}{2}$  lines, or twelfths of an inch. In this respect the skull agrees with those figured by Temminck (Mon. Mam. t. 3. f. 1-6) as of *Phalangista maculata*. But one skin agrees with the description of the skin of *P. chrysorrhos* of that author, and its teeth with the figure of the teeth of *P. maculata*. Yet it is to be recollected that this author only had a very small number of specimens to examine, and he does not mention in his

description of either species the difference in the size of the grinders, though he shows the difference in his figures.

The second species has smaller grinders, placed in the same manner as the former,—the three front grinders forming a series of from  $8\frac{1}{2}$  to 9 lines in length, as they are figured by Temminck (Monog. t. 1. f. 4–6) as *Phalangista chrysorrhos*.

We have two skulls with their skins belonging to this kind; and both have the spotted skins which Temminck calls *Phalangista maculata*. Under these circumstances it is difficult to adopt Temminck's name. Are we to take those of the skin or those of the skulls? Perhaps what he describes as *C. chrysorrhos* may be the proper and wild state of each species, and the spotted varieties described as *C. maculata* may be albino varieties or half-domesticated varieties of them, for the natives of some islands are said to breed them.

As I have not the power of examining the skulls of all the specimens, I have arranged those in the Museum provisionally under these two names, taking them as they designate the general colour of the fur.

### 3. CUSCUS (S.) CHRYSORRHOS.

*Cuscus maculata*, var. 1, 2, Gray, P. Z. S. 1858, p. 102.

*Phalangista maculata*, Temm. Mam. t. 2. f. 1–5 (adult), 6 (young skull).

The grinders \* large, three front of from 10 to  $10\frac{1}{2}$  lines in length.

Fur dark grey-brown; sides and middle of the back blacker or black; face reddish; rump and tail yellowish; belly white.

Var. *albina*?

White; feet and large spots on back red-brown.

*Hab.* Ceram; south coast of New Guinea; “Moluccas” (Temm.).

1. An adult female of a large size from the Leyden Museum as *C. chrysorrhos*, Temm. 1859.

2, 3. An adult and a three-fourths grown female, with the sides very deep black. From Ceram; Mr. Wallace, 1859.

4. A young female specimen from the south coast of New Guinea; J. B. Jukes, 1846.

The skull of this animal shows that it belongs to the large-toothed species.

Var. ? *albina*. White, reddish varied.

*C. maculata*, nos. 3–5, Gray, P. Z. S. 1858, p. 102.

5. White, with a long irregular patch on the back, and the four feet red. A female from Dufour Island, south-east coast of New

\* I give the measurement of the three first of the true grinders only, because in the young skull the hindermost grinders are not developed. I may state that the difference in the size of the grinders does not depend on the sex of the species, as there are both males and females with teeth of each size.

Guinea; John Macgillivray, 1851; and its skull, which agrees with Temminck's figure of the skull of *C. maculatus*.

6. ? An adult male, with numerous confluent reddish spots. New Guinea; John Macgillivray, 1855.

7. ? A half-grown male, with numerous small, reddish and dark-brown spots, often confluent. Darnley Island, south coast of New Guinea; John Macgillivray, 1855.

I have not been able to examine the skull and teeth of these specimens; so they may belong to the next.

#### 4. CUSCUS (S.) MACULATUS.

*Cuscus maculatus*, Lesson, Voy. Coq. t. 5.

*Cuscus maculatus*, var., nos. 3-7, Gray, P. Z. S. 1858, p. 102.

*Phalangista chrysoorrhos*, Temm. Mon. t. 1. f. 4, 5, 6 (skull, not skin).

Grinders moderate, three front forming a series of from  $8\frac{1}{2}$  to 9 lines in length. Skull very convex on the front of the orbit, flat or slightly concave behind the convexity, the temporal ridges close together, united (in the adult skull) and forming a sharp ridge.

White, spotted with fulvous grey-brown or black; forehead reddish.

*Hab.* New Guinea. Waygeroo and Aru Islands.

There are both sexes in the Museum Collection.

1. Adult male. Spots on the head and shoulders, confluent on the back and sides, small, scattered; tail white. Waygeroo. Purchased of M. Verreaux, 1856, as *Cuscus maculatus*.

2. Adult male. White, with numerous, scattered, small spots; tail white, slightly varied with pale reddish. Aru Island; Mr. Wallace, 1857. This belongs to the smaller-toothed kind.

3. Adult male and female. Very similar; yellowish white spots, numerous, smooth, intense black; head reddish-brown; tail white, marbled with pale reddish. Waygeroo (*Mr. Wallace*, 1860).

Mr. Wallace observes that these animals are diurnal: the female he marks as having a pale hazel iris. The skull of the male shows that it also belongs to the smaller-toothed kind.

The three skulls in the Museum agree with the above description, but vary among themselves; one of the skulls from Aru (1195 *b*) is much narrower in all its parts, and is less swollen and narrower between the orbits, than the others from the same locality, and is probably the skull of a female, as 1195 *a* is from the male specimen sent from Aru by Mr. Wallace.

The skull of the male specimen sent by Mr. Wallace from Waygeroo is similar to the male from Aru (1195 *a*), but is rather more swollen, especially between the front of the orbits.

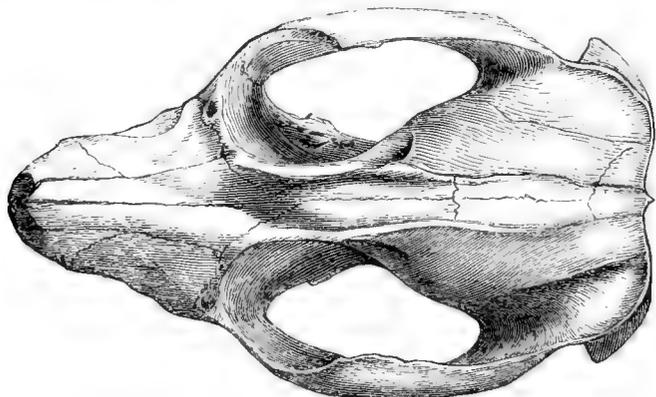
Sect. III. The nose of the skull rather produced, rounded. The anterior conical false grinders one on each side above, moderate-sized, near the middle of the broad diastema. The forehead deeply concave, with a raised edge on each side between the orbits. Ears naked

within, extended beyond the fur of the head. Fur of body and tail uniformly coloured, with a dorsal streak. **STRIGOCUSCUS.**

5. **CUSCUS (S.) CELEBENSIS**, Gray, P. Z. S. 1858, p. 105, t. 62.

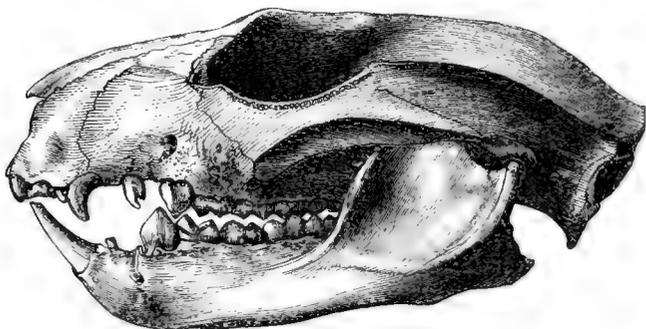
*Hab.* St. Cristoval, Solomon's Group of Islands.

We have both sexes in the British Museum Collection, and the skulls of two others nearly adult, collected by Mr. Rayner and Mr.



Skull of *Cuscus celebensis* (upper surface).

J. Macgillivray during the voyage of the 'Herald.' There is very little difference between the two skulls, though they are from a male and female animal.



Skull of *Cuscus celebensis* (side view).

In the description of the species in the paper above referred to, the animal is erroneously said, by a slip of the pen, to have no dorsal streak.

We have in the British Museum a young specimen of a *Cuscus* from Macassar, which is very like *C. celebensis*, but it has no visible dorsal streak: it is not in a very good condition. It may be a variety of this species, or the young of one of the other, or perhaps an undeveloped state of a new one.

Sect. IV. The nose of the skull rather produced, rounded. The anterior conical false grinders *two* on each side above, the anterior rather larger, the hinder very small, cylindrical; both near the other grinder, and widely separated from the canines. The forehead with a deep concavity between the orbits. Ears naked within, extended beyond the fur of the head. Fur on body and tail uniformly coloured, with a dorsal streak. CUSCUS.

6. CUSCUS ORIENTALIS, Gray, P. Z. S. 1858, p. 104, t. 61.

*Cuscus quoyii*, Lesson in Quoy & Gaim. Voy. Uranic, Zool. t. 56. f. 6.

The male and female grey brown, with a distinct dorsal streak.

Var. *albina*?

*Cuscus orientalis*, Temm. & Gray.

Males pure white, without any dorsal streak.

*Hab.* Islands of Waigiou and Ceram.

Mr. Wallace attached to the male species this observation, "the claws, soles, and end of the tail nearly white; eats leaves and cocoa-nuts (young)." He calls the male *C. orientalis*.

We have specimens of both sexes in the Museum; a very young and adult female from Waigiou, obtained from M. Verreaux in 1856; and male and female, with two young from the pouch, from Waigiou, and a male from Ceram, from Mr. Wallace, in 1859 and 1860.

In the skull of the female the temporal ridges are separated from one another by a wide flat band.

Temminck, and other authors since his work, have described the male of this animal as white, and the female as silver-grey with a black dorsal streak; but we have both sexes of the latter colour. Can the white males be an *albino variety*, and confined to the male sex? We have two full-grown males of that colour, one obtained from Leyden Museum, said to come from Amboyna, and another from M. Verreaux, said to come from New Zealand; they both have the small hinder false grinders.

7. CUSCUS ORNATUS, Gray, P. Z. S. 1860, p. 1, pl. LXXIV. (male).

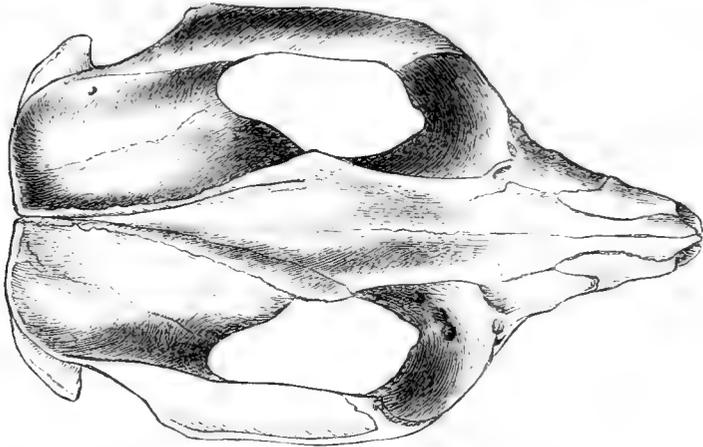
Both sexes grey-brown, grised, and marked with small white spots and a distinct dorsal streak; the ground-colour of the male is yellowish-red, of the female dark grey-brown.

*Hab.* Ternate and Batchian (*Wallace*).

We have a male and three females in the British Museum, all from Mr. Wallace—a male from Batchian in 1859, two adult and a young female from Ternate, obtained in 1858 and 1859.

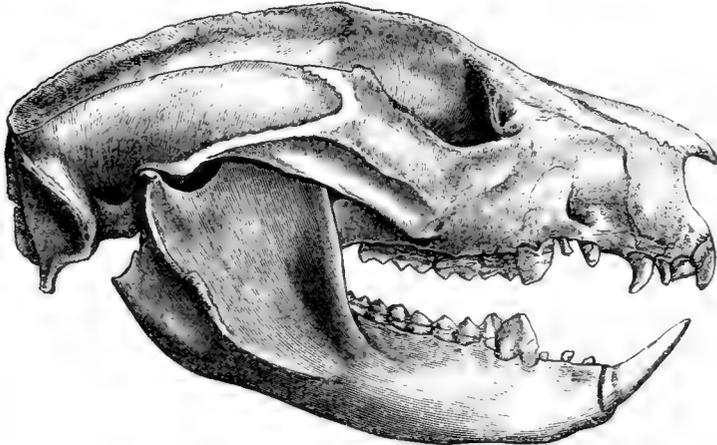
In the British Museum there are two young specimens of the genus which I am not able to determine with certainty. They are both of a fulvous-brown colour, and without any streak on the back.

1. Said to come from "Amboyna," and is supposed to be a young *C. orientalis*; the sex is doubtful, but probably a male.



Skull of *Cuscus ornatus* (upper surface).

2. The other was sent by Mr. Wallace from Macassar in 1857, and is a young male. I formerly considered it as a variety of *C. celebensis* (P. Z. S. 1858, p. 43); and it is like that species in se-



Skull of *Cuscus ornatus* (side view).

veral particulars; but the want of the dorsal streak is a great peculiarity, which was not so distinctly seen before it was stuffed.

5. ON THE OPHIDIANS OF THE PROVINCE OF BAHIA, BRAZIL.  
BY DR. OTHO WUCHERER, CORR. MEMB. (Part II.\*)

Of the family of *Coronellidæ* several species of *Liophis* are very common in this province—*Liophis cobella*, *L. merremii*, *L. reginæ*, and *L. conirostris*. The last appears to me to occur only in the vicinity of the city of Bahia. In several collections of Ophidians sent to me from different parts of the province, I never found a single specimen, whilst it is rather common in the vicinity of the city of Bahia. It never attains to the same size as the other species. Some specimens of *L. merremii* show so constantly certain differences from others, that I feel tempted to consider them as belonging to a distinct species, particularly as those differences are by no means referable to the different age of the individuals; however I shall withhold my suggestions until I shall have collected more materials to substantiate them. *Erythrolamprus venustissimus*, of the same family, is not unfrequent. It shares with different other snakes the Portuguese name of *Cobra Coral*.

The species of the genus *Xenodon*, which have been referred to the family of *Natricidæ*, are allied to *Liophis* in many respects. Their dentition is very similar; they may all be considered as fresh-water snakes (some species of *Liophis* are called by the Brazilians *Cobras d'agua*), although they are frequently found in dry places and at a distance from the water. They all live on Batrachians, and have this peculiarity in common with the other snakes of the family of *Natricidæ*, that they do not squeeze their prey to death before swallowing it, nor ever coil themselves around it.

I have noticed only two species of *Xenodon*—*X. rhabdocephalus* and *X. colubrinus*.

In a preliminary list of snakes observed by me, given by Dr. Albert Günther, *X. severus* is mentioned; however, on a repeated examination of the specimens in my possession, I must refer them all to *X. rhabdocephalus* †. This is a very common species in Bahia. Several young examples may be frequently found together. It is very lively and courageous, and, on account of its broad head and rather vicious appearance, much dreaded by the Brazilians, who give it the name of *Surucucú*. In order to distinguish *Lachesis mutus* from it, they call the latter *Surucucú bico de jacca*, from the resemblance of its strongly keeled scales to the prominences on the Jackfruit—the fruit of the *Artocarpus integrifolia*. This *Xenodon* is very voracious. Recently I had a young living specimen of it in the same cage with one of *Liophis conirostris*, and gave them two young *Cystignathi fuscii* for their food. The *Xenodon* immediately seized one of the frogs by the snout; but the *Liophis* did not succeed so well with the other frog, and found it easier to seize the *Xenodon's* prey by the hind legs. A struggle commenced, in which the *Xenodon* had better hold of the frog than the *Liophis*, and the latter, being obstinate and not in-

\* See above, p. 113.

† One specimen of *X. severus* in the Collection of the British Museum is mentioned in the Catalogue as derived from Bahia.

clined to relinquish its hold, began to encompass its head with its wide jaws. It became evident that the *Liophis* would have to share the fate of its intended victim. As it was the first living specimen of its species I had been able to obtain, I was very anxious to save its life; so I cut the *Xenodon* in two with a knife, and the *Liophis* quickly passed through the anterior segment of the *Xenodon's* body with the frog. The *Liophis* was returned to its cage, when it directly seized hold of the other frog, and swallowed it undisturbed. It had along its head, neck, and anterior part of the body minute wounds from the *Xenodon's* teeth, which bled freely while it was engaged in swallowing the frog; but it has done quite well since, and I hope it may arrive safely at the Gardens of the Society.

It is surprising how broad and flat a *Xenodon rhabdocephalus* makes itself at times, chiefly whilst basking in the sun. This is owing, I suppose, to a peculiar conformation and attachment of its ribs, which I have not yet examined. The species of *Liophis* never make themselves so broad. A *Xenodon* can pass a crevice which is exceedingly small in proportion to the width of its head,—one smaller than that which a *Liophis* with a much thinner body can pass.

Of the interesting species *Xenodon colubrinus*, so well established and happily named by Dr. Albert Günther, I received several live specimens from Ilhéos. When irritated, it rapidly strikes the ground with its tail—a habit I have also noticed in *Spilotes variabilis*, *S. pæcilostoma*, *S. corais*, and in *Coryphodon pantherinus*. In its habits it resembles also *X. rhabdocephalus*; but in the form of its head it shows great similarity to the members of the next family—that of *Colubridæ*. In this species I first noticed a bright white spot or groove on the tip of each scale. Recently I have become indebted to Dr. A. Günther's kindness for a perusal of Prof. Reinhardt's interesting paper on these curious spots or depressions. Reinhardt discovered them during his stay in Brazil, about thirteen years ago, in a living specimen of *Philodryas olfersii*—a snake which has not yet been noticed by me. After his return to Europe he found them in preserved specimens of many other Ophidians, and has tried to vindicate for them the importance of a classifying character, which they undoubtedly possess. Reinhardt mentions that these depressions had been noticed before by Wagler in species of *Xenodon*, by Holbrook in *Coluber alleghaniensis*, and by Günther in West Indian species of *Dromicus*, but that they had been overlooked by other herpetologists. In *Xenodon colubrinus* they are remarkably distinct, clearly perceptible with the naked eye; they are circular, and placed very near the tip of the scales.

The family *Colubridæ* is represented by two genera in this province—*Spilotes* and *Coryphodon*.

*Coryphodon pantherinus* is exceedingly common. The grooves on its scales are double, as in all the other species of this family, with the exception of *Zamenis dahliei*, Fitz., which, according to Reinhardt, has scales with a single groove. Reinhardt, however, observes that this Ophidian had been classed by Schlegel with the *Psammophidæ*, which have scales provided with a single groove.

Of the genus *Spilotes* I have noticed *S. corais*, *S. pœcilostoma*, and *S. variabilis*.

They are very similar in their habits, very bold; and the most undaunted is perhaps *S. corais*. It is called by the Brazilians "*Papapinto*," from its averred predilection for chickens, of which circumstance I have never been able to satisfy myself. It frequents the neighbourhood of rivers, where it often strikes terror into the black washerwomen occupied at their calling, by approaching and running after them. I have been told strange stories about its creeping on to the beds of sleeping women who nurse, and sucking at their breasts. It may be that, like many other reptiles, it is very fond of milk; and this may account in part for such tales, which have been current in other countries also. *S. corais* has generally seventeen rows of scales; but I have seen several specimens with only fifteen rows. One very large specimen from Caravellas in my possession, which measures 8', has nineteen rows of scales. The other two species of *Spilotes* are both called "*Cainana*;" the grooves on their scales differ from those of *S. corais* in being larger and oblong or elliptical. I was on the point of referring a specimen of *S. corais*, with fifteen rows of scales, to *Herpetodryas dendrophis*, on account of the slender form of its head; but the presence of the two depressions on each of its scales assisted me in its correct determination. With regard to *S. variabilis*, I must state that the specimens examined by me, which were all adults, had no loreal shield.

The *Dryadidæ* I have met with belong to two genera, *Herpetodryas* and *Philodryas*. *Herpetodryas carinatus* is one of the most common snakes in this province. The Brazilians call it, as well as all the other slender species of snakes, "*Cipo*," which signifies the stem or a stick of a creeping-plant. Before I had read Schlegel's 'Essay,' I referred all the specimens of *Herpetodryas* in which I did not detect any keeled scales to *H. fuscus*, this being the only distinctive character given in Günther's catalogue. When I found that Schlegel had not admitted *H. fuscus* as a separate species, I submitted all my specimens (several dozens) to a closer examination, and found that there was not a single one in which at least very slight traces of keels were not to be found in some scales; so that I feel inclined to follow Schlegel, and to consider my specimens as belonging to one species. According to Reinhardt, the scales of *Herpetodryas carinatus* are without any groove,—an observation with which I cannot agree, having found grooved scales in all my specimens. In some specimens they were found, indeed, only on a few scales of the neck near the head; others had them on the two middle rows of keeled scales. The occurrence of these grooves in *Herpetodryas*\* is very interesting, particularly because they are single, and not double as is generally the case in keeled scales. They are placed near to the inner edge, and at the point of junction of the distal with the

\* I have examined several specimens of this species: I was unable to find these grooves in *H. carinatus*; one specimen of *H. fuscus* showed a single groove on a few scales on the neck.—A. G.

middle third of the scale. They are proportionately smaller in larger specimens. The largest specimen noticed by me is 5 feet 7 inches long.

*Philodryas viridissimus* is not quite so common as the last species. The largest specimen I have seen measured 4 feet. Reinhardt found two grooves in the scales of this snake. After a careful search, I cannot find more than one groove at the tip of the scales. Some scales on the tail have certainly two grooves, evidently in consequence of the confluence of two scales.

*Philodryas schottii*.—I obtained a single specimen in a bad state.

Of the family of *Dendrophidæ* I have seen a single specimen of *Ahætulla liocerca* \*: it must be a very beautiful snake. It is said to be exceedingly lively; and this, with its proportionately long teeth, may be the cause of its being considered dangerous by the Brazilians.

The family of *Dryophidæ* has two representatives in Bahia, belonging to the genus *Dryophis*—*D. argentea* and *D. acuminata*. The former is very scarce (I have seen only one specimen in Mr. C. M. Föppel's collection), the latter very common.

## 6. DESCRIPTION OF A NEW SPECIES OF ELAPOMORPHUS FROM BRAZIL. BY DR. OTHO WUCHERER, CORR. MEMB.

### ELAPOMORPHUS SCALARIS.

Eight upper labials, the fourth and fifth touching the eye, the seventh largest. Scales in seventeen rows; 128–130 ventral shields; dirty brick-red above; head brownish, with a black narrow dorsal streak traversed by short black bands; narrow black spots on the sides.

*Hab.* Cañavieras, Matta de S. João, Bahia.

*Description*.—The body of moderate length, almost cylindrical; belly flat; the tail short. Head moderate, distinct, with flat crown; the cleft of mouth moderate; rostral shield triangular, almost reaching the surface of the head, recurved, concave, the inferior edge slightly protruding; three frontals, two anterior and one posterior, the former small, almost triangular, very narrow in the antero-posterior direction, the posterior one very large; one nasal pierced by the nostril; nostril large, lateral; superciliary shield small; one anterior, two posterior oculars, the anterior large, high, forming a short suture with the vertical; loreal elongate; vertical moderate, almost triangular; occipitals large, forked behind; one temporal, sometimes two, one behind the other, touching the inferior posterior ocular; upper labial shields eight, the fourth and fifth touching the eye, the seventh largest; eye moderate, sublateral, pupil round; scales rhombic, not truncated, smooth, equal, without any groove, a few in the middle row of the tail larger, in seventeen rows; posterior tooth longest, grooved; two pair of chin-shields. Snout and part of crown brown and bluish iridescent, irregularly speckled with black; lips

\* I received it from Mr. Christopher Gayleard, whose unceasing kindness in assisting me to collect specimens I am happy to acknowledge.

white; the back is of a dirty brick-colour: a black streak, of the breadth of the middle dorsal row of scales, runs along the body almost to the tip of the tail; this is crossed by short, transverse, black bands, some of which do not correspond exactly in their lateral halves; on the sides a line of narrow, almost linear, black spots; underneath uniform yellowish white.

Dimensions of two specimens:—

Length of head . . . . .	0·010	0·013
Length of tail . . . . .	0·040	0·055
Total length . . . . .	0·320	0·250
Ventral shields . . . . .	128	34
Subcaudal shields . . . . .	130	34

The smaller specimen is in the British Museum. The larger specimen was sent to me from Cañavieras. It was injured in the head, and a few characters are not recognizable; the smaller corresponds with it in every particular. I received it from M. C. Gayleard, from the Matta de S. João, a few leagues south from the city of Bahia. This species differs from others in the shape of its head, which is distinct, in having a shorter body, broader ventral shields, and seventeen rows of scales; but the dentition and coloration are very similar.

#### 7. REVIEW OF THE VERMETIDÆ. BY OTTO A. L. MÖRCH (OF COPENHAGEN). (Part II.\*)

Genus SPIROGLYPHUS, Daudin, Recueil, 1800, p. 39.

*Spiroglyphus*, Gray, Guide, 1857, p. 127; Mörch, Journ. Conch. 1859, viii. p. 360.

*Bivonia*, Gray, Proc. Zool. Soc. 1847, p. 156 (nec Gray, nec Cat. Brit. Mus. 1842, pp. 62 & 90); Gray, Figs. of Moll. 1850, iv. p. 82 (not description); Adams, Genera, p. 358 (not the description).

*Stoa*, De Serres, Ann. des Sc. 1855, pl. 259. pp.

*T. plerumque planorbiformis corrodens; striæ incrementi expressæ; liræ spirales rarissime inveniuntur.*

*Operculum magnum crassum superne convexum, laminis concentricis crassis; inferne planum concentrice liratum, centro mammilla cylindrica valida, periphæria margine angusto elevato sæpe compresso; color sanguineus vel atro-purpureus.*

The shell of this genus is so similar to that of *Stoa* that it can only be distinguished by the operculum, which is convex outside, flat inside, with a central cylindrical wart, not mentioned either by Dr. Gray (Guide), by Bivona, or Philippi. It has some relations to the lid of *Vermiculus*, and in some respects it approaches that of *Pyxi-poma*; I know at least no true *Vermetus* which, according to the lid, is more allied to it. The colour varies in all the species from bright purple to nearly black, and the surface from nearly flat to very convex. I refer to this genus *V. glomeratus*, Biv., which only

\* See P. Z. S. 1861, p. 145.

differs in having the central mammilla conical and not cylindrical. The colour of the shell is generally brown, often white with brown transverse bands. Chemnitz and Carpenter regard the genus as being sinistral; but I cannot see any difference between it and the other *Vermeti*.

1. SPIROGLYPHUS SPIRULIFORMIS, De Serres, 1855.

“Cette espèce est caractérisé par le dernier tour détaché des premiers, qui se prolongent dans l'âge adulte en un tube légèrement recourbé bien au-delà de la spire orbiculaire formée par l'ensemble de ces mêmes tours. Diam. 0<sup>m</sup>.026 à 0.028.”—*M. de Serres*.

*Stoa spirulæformis*, De Serres, Annales des Sciences, v. p. 241, t. 8 c. f. 1.

“La *Stoa spirulæformis* a été rencontrée sur la *Pinna nigrina*, coquille décrite par Lam. comme de la mer des Indes, tandis que nous l'avons reçue de l'île de Zanzibar. Quant à la *St. spirulæformis*, elle paraît habiter sur les valves de quelques Modioles de l'Océan Atlantique boréal, ainsi que des côtes de l'Amérique septentrionale.”

The specimen represented is most probably from Zanzibar, the American locality being very likely wrong, which is not improbable from the curious form of the sentence commencing with “Quant.”

I have not seen any shell corresponding to the representation quoted. The first whorls appear to be smooth, in which respect it differs from all the following varieties. It is stated that the specimen is represented of the natural size, and double as large as *S. perforans*; but fig. 6, the natural size of the latter species, is, on the contrary, represented somewhat larger.

Var. α. SCAPHITOIDES.

*T. forma* Scaphitis twanii parum immersa; anfr. obtuse quadrangulares; anfr. juveniles bullati læves castanei; anfr. sequentes planorbiformes, superne planati, liris incrementi arcuatis approximatis regularibus; anfr. ultimus rectus, versus aperturam solutus incurvus, latere externo plano, laminis incrementi deplanatis arcuatis convexis, superne planatus, laminis incrementi crassis arcuatis reductis, antice profunde excavatis, plerumque duplicatis. Color badius, aperturam versus cinereus; fascia lateralis castanea. Apertura ovalis leviter contracta.

Diam. spiræ circ. 4 m., long. 8 m., diam. ap. 1 m., diam. anfr. ult. 1½ m.

*Hab.* Ins. Philippin., on a young specimen of *Margaritifera muricata*, Reeve; of the same shape as the preceding, but much smaller (*coll. Cuming*).

Var. β. VORTEX.

*T. planorboides*; anfr. angulati cinerei, superne plani, linea lata badia submediana, laminis incrementi irregularibus subremotis, arcuatis, antice hiantibus.

Diam. ap. 5–6 m., dm. apertura 1½ m.

*Operculum crassiusculum superne planum, lira arctispirali, periphæria membranacea, centro puncto impresso annulo obsoleto circumdato; inferne margine peripherico angusto bipartito, parte interna sanguinea, parte externa flavescente, centro mammilla latiuscula parum prominente.*

Diam.  $1\frac{1}{8}$  millim. (coll. Cuming).

Hab. Ins. Philippin., on *Haliotis ovina*, Chemn., slightly corroding.

Var.  $\gamma$ . LEMNISCATA.

*T. tenuiuscula, anfr. primi planorbiformes, anfr. ultimi lemniscatim contorti.*

On the same shell as the preceding.

Var.  $\delta$ . SPIRALIS.

*T. tenuis castanea fascia spirali lata alba, læviuscula, anfr. alio super alium decliviter et spiraliter incumbentibus, striis incrementi obsoletis, lira spirali obsoletissima.*

On the same shell as the two preceding varieties.

Five or six specimens agreeing with the above description differ entirely in the manner of contortion from that known in the other species; but the transition to the planorboid varieties seems to me so striking, that I do not dare to include it in another genus or species. The striæ of growth are bent in the same way as in the preceding, but are very rarely slightly foliaceous. It is deeply corroding.

Var.  $\epsilon$ . SOLIDISSIMA.

*T. crassa parum immersa planorboides vel lemniscatim contorta, alba, in anfr. ultimo angulo laterali linea badia notata; laminæ incrementi obsoletæ antice excavatæ, interstitiis sæpe foveatis.*

Diam. aperturæ fere 2 m.

*Operculum solidum crassum atro-purpureum; superne convexum fere hemisphæricum, lirula arctispirali obsoleta; inferne margine peripherico elevato angusto incrassato sanguineo; impressio muscularis concaviuscula, centro mammilla valida cylindrica prominente, vertice plano dilatato. Op. superne fascia peripherica lata flava.*

Diam. fere  $1\frac{1}{2}$  m.

About ten specimens on *Chama radiata*, Lam. (Mus. Reg.).

Var.  $\zeta$ , operculo dilute sanguineo.

*Operculum dilute sanguineum planum, mammilla centrali parva, periphæria lamina tenui flava.*

On *Turbo marmoratus*, several specimens showing considerable variations in colour and shape. The shells are so overgrown with *Nulliporæ* that they cannot be described. The colour is brown inside, white outside.

Var.  $\eta$ . IMMERSA.

*T. profundissime immersa; anfr. plani; liræ incrementi arcuatæ confertæ minutissimæ.*

*Serpula spirorbis contraria*, Chemn. ix. p. 140.

*S. spirorbis, orbiculata sinistra*, Chemn. ix. p. 151, f. 999.

*S. spirorbis* β, Gm. S. N. 3740.

*S. spirorbis*, var., Dillw. p. 1073.

*Spiroglyphus contrarius*, Mörch, Journ. Conch. 1859, vii. p. 45.

*Hab.* On *Polydonta granularis*, Bolten: from Tranquebar.

I have seen several specimens on the shell represented by Chemnitz; but they do not seem to differ from the preceding, except by burrowing very deeply, in such manner that the sides are entirely concealed, and the surface is sunk to the same level as the surface of the *Trochus*; but this appears only to depend on the nature of the outer layer of the *Trochus*.

Var. θ. ERYTHRÆENSIS.

*T. albescens, intus castanea, laminis incrementi tenuissimis confertis brevibus sigmoideis; anfr. aperturam versus solutus cylindricus.*

*Operculum superne convexum, inferne concaviusculum, margine peripherica angusta elevato bipartito, parte interna purpurea, externa flava; mamilla centrali læte aurantiaca.*

*Hab.* On *Arca foliacea*, Forsk., from the Red Sea (*Mus. Reg.*).

Var. ι. DISCULUS.

*Operculum superne convexiusculum; inferne planiusculum, area immersa bipartita, disco centrali lato atro concentricè lirato, zona externa angusta nuda; mamilla centrali aurantiaca; limbo latiusculo leviter elevato nitido bipartito, parte interna saturate purpurea, externa sanguinea.*

From the same shell as the preceding.

2. SPIROGLYPHUS AMMONITIFORMIS, De Serres, 1855.

*Coq.* "discoïde, à tours continus et arrondis, diffère de la *S. spirulæformis*, en ce que les derniers tours ne se détachent jamais des premiers, et qu'ils sont fortement striés.

"Grand diam. 0<sup>m</sup>·020 à 0·021; petit diam. 0<sup>m</sup>·016 à 0·017."

*Stoa ammonitiformis*, De Serres, Ann. des Sc. v. p. 240, t. 8. f. 2.

"Sur les valves de la *Perna isognomon*, coquille bivalve des mers des Indes."

I do not know this shell; perhaps it is more allied to *Stoa perforans*, which is like it in respect of the aperture.

3. SPIROGLYPHUS PLANOBIS, Dkr. 1860.

*T. solidula, alba, planorbiformis, carinata, transversim sublamellosa.*

Lat. vix 4 m.

*Vermetus planorbis*, Dkr. Mal. Blätter, vi. Jan. 1860, p. 240.

*Hab.* Decima Harbour, Japan (*Dr. Nuhn, Mus. Heidelb.*). On *Vermetus imbricatus*, Dkr.; slightly immersed in the surface.

The embryonal whorls are smooth, projecting in the centre of the shell, and not unlike a very small *Ammicola*. It differs from *V. corrodens*, D'Orb., in having more regular whorls, and in wanting the tooth-like process of the carina in the aperture. I do not know this species, which seems very nearly allied to the two preceding species.

#### 4. SPIROGLYPHUS SPIRORBIS, Sow.

*Serpula spirorbis*, Sow. Gen. f. 3.

*Spiroglyphus spirorbis*, var., Dillw., Sow. Man. p. 101. f. 8.

*S. spirorbis*, Adams, Genera, p. 360, pl. 39. f. 4 (copy).

*S. spirorbis*, Chenu, Man. p. 320, f. 2305 (copy).

Represented on a *Patella*, probably from the Cape of Good Hope. I have seen one very similar on *P. argenvillei*, Kraus, but it is perhaps a *Stoa*.

#### 5. SPIROGLYPHUS SCHRÖTERI, Mörch.

*Helmintholithus muricis alati, ala mulctatus, serpularum lumbri- calium undequaque sparsus*, Fortis. Della valle vulcanica marina di Ronca nel territorio Veronese, 1780 (*ex Haquet*).

*Lituiten mit gezähnelten Rändern*, Haquet, Nachricht von Versteinerungen, 1780, 8vo, p. 25, t. 1. f. 2 g, f.

*Item*, Schröter, Journal, vi. 1780, p. 267.

*Serpulites muricinus*, Schloth. Petref. 168 (cf. Verz. 68).

*Spiroglyphus Schröteri*, Mörch, Journ. Conch. viii. p. 45 (1860).

*Hab.* Fossil, Valle Canella in situ vulcanico di Ronca (*Haquet*).  
Burrowing on a *Strombus*.

#### 6. SPIROGLYPHUS STRAMONITÆ, Mörch.

*T. planorbiformis, profunde immersa, castanea nitida; anfr. ultimus extus obtuse angulatus, liris obsoletissimis 1 vel 2, malleatus, aperturam versus albus, strigis transversis castaneis antiquatus; striæ incrementi obsoletissimæ; anfr. primi plani; testæ infantilis apice bullato, flavescente.*

Diam. testæ  $2\frac{1}{2}$  m.; diam. aperturæ  $\frac{3}{4}$  m.

*Operculum tenuiusculum superne planum, area centrali lata rugulosa, annulo vivide coccineo circumdato, periphæria aurantiaca; inferne margine elevato angusto peripherico, inde concaviusculum, tuberculo centrali circulo immerso atro-purpureo circumdato* (Mus. Reg.).

*Hab.* Guinea? on *Purpura* (*Stramonita*) *hæmastoma*, L., var.

Not unlike the *Spiroglyphus* on *Patella tarentina*, in Deless. t. 23. f. 7.

#### 7. SPIROGLYPHUS ANNULATUS, Daudin.

"*Sp. in spira irregulariter contortus, annulisque contextus.*"

"Longueur de six lignes. Tube d'égal grosseur partout, tortillé en un tour de spire irrégulière, et composé d'une multitude de très-

petits anneaux couleur de corne, qui ont la forme d'une maille de tricot."—*Daudin*.

*Spiroglyphus annulatus*, Daudin, Recueil de Mém. 1800, p. 50.

*S. annulatus*, Bosc, Hist. Vers, 1802, i. p. 187, t. 7. f. 5 (copy).

*S. annulatus*, Blainv. Dict. Sc. l. p. 296.

*S. annulatus*, Mörch, Journal de Conch. viii. p. 44.

*Hab.* Sur les Patelles et les Fissurelles de l'océan indien.

The represented species is probably *Fissurella barbadensis*, Gm.

Var. α. DENTIFERA.

*T. irregulariter contorta, transversim lamellata, longitudinaliter carinata: aperturæ dente prominulo e carina formato.*

Diam. 10 m. (*D'Orb.*).

*Vermetus corrodens*, D'Orb. Cuba, p. 235, t. 18. f. 1–3.

*Spiroglyphus corrodens*, Gray, Brit. Mus. Cat. Moll. Cuba, p. 14. no. 147. p. 47.

*S. corrodens*, Schutleworth, Ann. des Sc. 1855, p. 319.

*S. corrodens*, Mörch, Journ. Conch. viii. p. 44.

*Hab.* Cuba. Martinique, always on *Turbo tuber*, D'Orb. St. Thomas. Porto Rico. Jamaica, on *Chiton piceus*, *Vermetus*, sp., *Turbo tuber*, *Trochus pica* (*Meleagris*), Schutlw.

Var. β, *linea badia spirali*. Humphr. Conch. t. xi. f. 13 (semi-adulta).

*T. cinerascens, carina acuta castanea laterali, latere externo perpendiculari transversim rugoso læviusculo, latere interno lato declivi, laminis arcuatis crassis approximatis.*

Diam. ap. fere  $2\frac{1}{2}$  lin.

*Hab.* I. Barbados, on *Fissurella barbadensis*, Gm. (coll. Cuming).

Var. γ. GLOMERATA.

*T. albescens vel castanea, præsertim intus, laminis tenuissimis transversis. Operculum planum vel hemisphæricum, atrum vel cocci-neum.*

*Vermetus irregularis*, D'Orb. Cuba, t. 17. f. 16–18, sed vix descript. p. 235.

"*T. fusco-nigra, irregulariter contorta, transversim rugosa plicata (vel longitudinaliter sulcata, glomerata).*"—D'Orb.

*Serpula glomerata*, Brooke's Introd. f. 133 (verisimiliter).

*Hab.* St. Thomas, on *Rhipidogorgia flabellum*, L., forming large, compact, globular masses, sometimes nearly 8 dm. in diameter.

D'Orbigny's representation appears correct; but the last sentence of the diagnosis is perhaps taken from another associated species, very likely *V. varians*, D'Orb., which is always "contourné obliquement en spirale," as stated in the description of *V. irregularis*. I have seen both species together in one group, but the former species very sparingly. According to D'Orbigny, it is found at Cuba and Martinique, "sur les rochers, dans les plaques d'eau, où elle a été recueillée par M. Candé."

Var.  $\delta$ . TROCHICOLA.

*T. gracilis varie torta, planorbiformis vel scaphitoides, profundissime immersa, badia; anfr. plani, lirulis incrementi arcuatis regularibus vix prominentibus.*

Diam. ap.  $1\frac{1}{5}$  m.

*Hab.* St. Thomas, on *Livona pica*, L., very deeply corroding, sometimes even under the surface, but not concealed. On *Tectura melanosticta*, Gm., in the same manner. This variety is perhaps more nearly allied to *Spirogl. stramonitæ*, M.

*Operculum (varietatis  $\beta$ ) solidum crassum coriaceum, superne convexum vel fere hemisphæricum, lira arctispirali nigra; area centrali plana vel interdum immersa atropurpurea, annulo coccineo circumdata, fascia latiuscula peripherica flavescente; inferne planum, liris concentricis 3-4 pulcherrimis, lira externa valida; mammilla centrali cylindrica, vertice plano ruguloso; peripheria margine elevato angusto lævi pallide coccineo.*

Var.  $\epsilon$ .

*Operculum superne area centrali elevata convexa, atro-purpurea fascia coccinea circumdata, peripheria albescens; inferne area centrali (farinosa casu?) liris 2-3 concentricis acutis, fascia coccinea circumdata; peripheria angusta, parum elevata, bipartita pallide flava margine albescente; mammilla centrali distincta.*

From a specimen attached to *Fissurella barbadensis*.

## 8. SPIROGLYPHUS ALBIDUS, Carp.?

*Operculum g, et forsani f?*, Carp. Cat. p. 311.

*Bivonia albida*, Carp. Cat. Mazatl. p. 307?

“*T. parva, albida; anfr. duobus primis lævibus, turbinoideis, subelevatis, postea amplectatis; anfr. normalibus subregulariter spiraliter contortis, marginibus subparallelis, ad sese plerumque, ad concham alienam parum, adhærentibus; rugis concentricis plus minusve expressis, spiralibus nullis.*”

Long. 22 m.; lat. .1; diam. ap. .03.

*Hab.* Mazatlan: extremely rare, off *Spondylus* (Liverpool coll.).

The operculum *g* is without doubt that of a *Spiroglyphus*, and not that of *Bivonia contorta*, var. *indentata*, as regarded not improbable by Carpenter. The operculum *f* differs from all the opercula of this genus I have seen, in being thin and concave; but as it is stated to be closely resembling the operculum of *Bivonia glomerata*, Phil., I do not doubt it is truly congeneric, and perhaps conspecific, as the opercula of this genus are exceedingly variable in shape. That it cannot belong to *Bivonia contorta*, as regarded probable by Carpenter, seems evident to me, from the original specimen of Carpenter showing distinct elevated lines on the columella, which proves it to be that of a *Vermetus*. I have never seen any elevated columellar line in a *Spiroglyphus*.

Sect. A. *Operculum inferne mammilla centrali abbreviato-conica, vertice obtuso.*

*Bivonia*, Adams, Genera; Gray, Guide, not Cat. 1842.

9. SPIROGLYPHUS GLOMERATUS, Bivona, 1832.

*V. testis cylindricis aut subangulatis, contortis, in massam conglomeratis, transversim undulato-rugosis.*

*Operculum completum, convexum semiglobosum, rufum superne cinereum, rugosum, secundum Bivonam spiratum, anfractibus laminosis tenuibus numerosissimis confertis; subtus medio concavum, margine nitidissimo lævissimo libero (Phil.).*

*Animal viridi-fuscum, cinereo et nigro punctatum et maculatum, interdum strigis atro-purpureis duabus in dorso; area inter tentacula anteriora et pedem alba (Phil.).*

Diam. ap. vix. 2<sup>'''</sup>.

*Vermetus glomeratus*, Bivona, Nuovi Genere e Nuovi Sp. p. 12, t. 5. f. 5 (Phil.).

*V. glomeratus*, Phil. Enum. i. p. 171, t. 9. f. 23; ii. p. 144.

*Bivonia glomerata*, Gray, Fig. of Moll. i. t. 188. f. 5; iv. p. 49.

*B. glomerata*, Adams, Genera, i. p. 358, t. 39. f. 1 (copy), f. a-c (original).

*B. glomerata*, Mörch, Journ. Conch. viii. p. 361.

*Hab.* Præsertim prope Panormum frequenter occurrit (Phil.).

The description of the operculum is very incomplete, the central mammilla being overlooked. I have not seen any operculum nearly hemispherical, as represented; but I do not doubt, from analogy with the other species, that it is occasionally found.

Var. a. CRUSTANS.

? *Le Gateau des Vermisseaux*, Fav. t. 8. f. Q, from Provence.

*Das graue und braune Wurmgewächs*, Kundm. Rariora, 1737, p. 164, t. 10. f. 3.

*Bivonia glomerata*, Adams, Gen. t. 39. f. 1 a, b, c.

*T. agglomerata crassa, laxè spiraliter torta; anfr. primi teretes lævigati, candidi fundo cinereo, sulcis concentricis subremotis articulatum adstricti; anfr. ultimus fuscescens, carina laterali acuta, latere externo subperpendiculari rudi, latere interno declivi, laminis incrementi leviter arcuatis irregularibus approximatis; apertura circularis obliqua, diam. 5 m.; dissepimenta convexa v. cupuliformia, cretacea. Testa juvenilis corrodens planorbiformis badia, anfractibus angustis angulo laterali obtuso.*

*Operculum atro-purpureum crassum coriaceum planiusculum, superne laminis brevibus concentricis irregularibus, area centrali lata convexa; inferne area musculari excavata opaca atra, concentricè lirata, nodo centrali conico-convexo rufo; limbus nitidus bipartitus; zona interna convexa atra, externa coccinea tenuis oblique conferte striata, margine subreflexo.*

Diam. fere 4 m.

*Operculum juvenile planum tenue, inferne vivide coccineum.*

Diam.  $1\frac{1}{2}$  m.

*Variat laminis confertissimis et convexitate.*

*Hab.* In Mari Mediterraneo.

In Mr. Cuming's collection is a large flat crust, nearly the size of the hand, showing on the under side white, smooth, cylindrical whorls, with annular contractions, which seems to have been imbedded in chalk, but does not appear corroding. The representation of Philippi is very like it; the last whorl on the upper side differs entirely in shape, sculpture, and colour. A specimen from Bivona himself, in Dr. Hornbeck's collection, is very like Mr. Cuming's group. According to Philippi, it is chiefly common near Palermo. According to the locality, Golfo di Tarento, it is probable that the *Spiroglyphus* represented on *Patella tarentina*, in Delessert's 'Recueil,' pl. 23. f. 7, is the young of this species.

A small group of agglutinated straight tubes from the Adriatic Sea, by Trieste, in the collection of Mr. Alfr. Benson, furnishes the following form, probably referable to this species:—

Var.  $\beta$ . TUBULOSA.

*Serpula annulata*, Lam. Hist. 1818, v. p. 364. no. 10; ed. 2. v. p. 620.

*S. annulata*, Blainv. Dict. des Sc. xviii. p. 556.

*Vermetus annulatus*, Rouss., Chenu, Ill. t. 2. f. 1, 1 a.

“*Testis teretibus, gracilibus, annulatim plicatis porrecto-flexuosis, glomeratis.*”

“Elle est blanche, et sa masse ressemble à un paquet de petits intestins allongés” (Lam.).

This group has the tubes of only  $1\frac{3}{4}$  m. diameter; in another group from M. A. W. Malm, at Göteborg, without locality, the tubes are somewhat larger. The inside of the first whorls, which are all broken, is pale brown.

To this genus the following species might perhaps be referred:—

*Vermetus infundibulum*, Chenu, Ill. t. 10. f. 12 (with a young one).

*V. costalis*, Lam., Chenu, Ill. t. 10. f. 11.

*Spiroglyphus marginatus*, M'Coy, 1844.

*S. marginatus*, Morris, Brit. Foss. p. 69 (Carboniferous Limestone).

#### VERMETUS, Adanson, 1757.

*Campulotus*, Guettard, 1774, Mém. iii. p. 94.

*Bivonia*, Gray, P. Z. S. 1847, p. 156; Adams, Gen.; Carp. Cat.

*Petalocochus*, Lea, Trans. Am. Phil. Soc. 1843, p. 229; Woodw. Man. p. 462; Carp. Cat. p. 308, et P. Z. S. 1856, p. 313.

*Aletes*, Carp. Cat. p. 301.

*T. affixa irregulariter spiraliter torta, nunquam turritelloidea, plerumque decussata; columella lira mediana elevata; sæpe laminis duabus spiralibus varie dispositis.*

*Operculum tenue flavum concavum parum spirale.*

*Animal viviparum dorso utrinque carinato, tentaculis breviusculis, filamentis pedalibus longis contractilibus.*

A small group from Gaboon, corresponding to the description and figure of Adanson's "*Vermetus*," shows internally spiral lamellæ, proving its identity with *Petalocōnchus*, Lea.

I have convinced myself, by comparison of numerous specimens, that the presence or absence of laminae are not even of specific value, although their forms, when present, afford characters of some value. The individuals seem to undergo changes with age, analogous to those of the genus *Cypræa*. The laminae seem to be dependent on a thin, white, soft layer, sometimes covering the whole interior; they are mounted on a small elevated line in the mass of the shell; and one, sometimes compressed and sharp, is always found on the median part of the columella. These lamellæ must be regarded as a kind of septa, or perhaps as a muscular attachment analogous to the cup of the *Calyptæidæ*, as first advanced by Carpenter; but I have not observed any attachment in specimens *in spirit*. The animal occupies only the space near the columella, leaving the outer, often much larger space empty; the last whorls are quite filled out by the animal. The laminae are most frequently present in the median whorls, wanting in the first and last whorls; sometimes they are continuous to the aperture, but never when the last whorl is raised in an erect tube. The size and thickness are very variable in one and the same individual, sometimes very broad, nearly touching each other, whilst in the following and preceding whorls they are very short, leaving a large gap between them.

Septa are rarely met with. Carpenter mentions in *Petalocōnchus cochlidium*, a septum traversed by the laminae. Sowerby first represented a *Vermetus glomeratus* closing the aperture with a septum, turning the convexity upward, and provided with a narrow central opening. Dr. Gray\* supposed it to be the production of some parasitical animal †, induced by the fig. 18. pl. 57 of Delle Chiaje; but the discovery of *Rhizochilus* led him to regard it as a peculiarity of the species. I have only once seen a similar instance, in a detached specimen of *Vermetus varians*, D'Orb., from St. Thomas (coll. A. H. Riise). The septum, constricted a little below the free margin of the aperture, has a short narrow slit, not provided with teeth like Dr. Gray's specimen, and is of the same colour as the shell, but paler; which makes Dr. Gray's opinion very probable. This suggestion is still more strengthened by some small solitary spiral *Vermeti*, attached on *Isognomon obliquum*, Gm., and *Tridachna squamosa*, having the last whorl erect and free, with the borders of the aperture inflected so as to form a reniform or heart-shaped opening, but transverse and much larger than the slit in the preceding. The principal difference is that the walls of the aperture are bent inward. These small shells have a single series of impressed linear varices, like those of *Pythia* and *Eulima*; to the left of each varix the whorls are a little inflated. I have seen the West

\* Gray, Annals of Nat. Hist. viii. 1851, p. 479, pl. 17 B. f. 4-6; Froriep, Jahresbericht, 1851-52 (translation).

† It is indeed very like the constriction formed by *Sipunculus strombi*, Mont., in the shell of *Dentalium*.

Indian form *Vermetus varians*, D'Orb., passing over to the form with plaits; this form of aperture must consequently be dissolved with age. *Varices maniciformes*, of Philippi, are not unfrequently met with, the insides of which show several raised transverse laminae, probably arising from the dissolved old whorls. Several species are corroding, but I have never met with a planorbiform corroding shell.

I divide this genus into the following four subgenera, of which the last two very likely only depend on differences of age, corresponding to *Bulla*, *Marginella*, and the adult state of *Cypræa*; but I have not seen a sufficient number of opercula to decide the question with certainty, although I have compared numerous specimens of shells. In the following list of species I use the names *Aletes* and *Thylacodus*, to distinguish the varieties which I regard as analogous.

Subgenus 1. VERMETUS, Adans.

*T. anfractibus gracilibus, laminis e parietibus procedentibus.*

Typ. *V. Adansonii*, Daudin; *V. renisectus*, Carp.

Subgenus 2. PETALOCONCHUS, Lea.

*T. ut præcedentis, sed laminis ab axi procedentibus.*

Typ. *V. macrophragma*, Carp.; *cochlidium*, Carp.; *flavescens*, Carp.

The position of the laminae is not quite constant. In a large dissected specimen, where the laminae can be followed throughout the length, they often deviate considerably from the columella.

Forma 1. *Thylacodus*, Mörch.

*T. ut præcedentium, sed anfr. plerumque longissimi, laminis internis nullis; columella liris spiralibus 4-5, lateralibus obsoletissimis.*

Typ. *V. subcancellatus*, Biv.; *V. contortus*, Carp., *V. conicus*, Dill.

I have seen a specimen of the last species which is in the fore part an *Aletes*, and in the first whorls a plaited *Vermetus*.

Forma 2. *Aletes*, Carp.

*T. ut præcedentium, sed anfr. ampli, sæpe sutura dilatata; columella liris obsoletissima mediana.*

Typ. *A. centiquadrus*, Val.  
*Vermetus*, Adanson.

Subgen. 1. VERMETUS.

1. VERMETUS ADANSONII, Daudin, 1800.

“Chaque coquille représente une espèce de cylindre de 5 à 6 pouces au plus de longueur, dont le diamètre, qui a une ligne et demi à deux lignes de largeur en haut, diminue insensiblement jusqu'au sommet, où elle se termine en une pointe très-fine; le nombre des spires varie depuis 5 à 12, peut-être davantage. L'ouverture s'élève

d'un ponce au-dessus des spires. Son épaisseur n'est pas bien considérable, mais sa dureté surpasse celle de la plupart des coquilles. Elle est cannelée dans toute sa longueur, ou relevée de 6 à 12 petits filets ridés pour l'ordinaire ou chagrinés. La couleur, pendant que l'animal vit, est au-dehors d'un brun foncé, qui après sa mort devient cendré; au-dedans elle est violette.

"*Opercule* extrêmement mince, et marqué sur sa surface de deux petits sillons circulaires concentriques. Il est une fois plus petit que le diamètre de la coquille.

"*Animal* cendré tirant sur le noir, depuis la tête, qui est mouchetée de petits points jaunes jusqu'au manteau; depuis le manteau jusqu'au milieu du corps il est blanc-sale, et noirâtre à l'extrémité inférieure."—*Adanson*.

*Le Vermet*, Adanson, Senegal, p. 160, pl. 11.

*Tubuli instrumentum pro extrahendo subere vel globulis scolopetariis representantes*. Martini, i. f. 24 B (copy).

*Campulote à cannelures ridées, &c.*, Guettard, iii. p. 108, t. 69. f. 6.

*Vermiculaire le Vermet*, Favanne, i. p. 662, t. 6. f. H.; Fav. Zoomorphose, t. 18. GH (copy).

*Vermetus Adansonii*, Daudin, Recueil, 1800, p. 35; Gray, Phil. Trans. 1833, p. 816; Hanley, Ipsa Linn. Conch.

*Vermicularia vermet*, Bosc, Vers, p. 326, t. 49. f. 3 (copy).

*Vermetus lumbricalis*, Royssy, Hist. Moll. v. p. 399, t. 56. f. 1 (non Linn.).

*V. lumbricalis*, Rang, Man. p. 187.

*Hab.* Ins. Gorea et Magdalena. It is especially found in the basins where the water is quiet, and particularly in those excavated naturally in the rock (*Adanson*).

I possess a small crust from Gaboon, showing in the sections plaits of the stamp of *Petalococonchus renisectus*, Carp. Proc. Z. S. 1856, p. 315, fig. 5. The colour is concealed by a brownish, probably foreign matter.

Var.  $\alpha$ . LAMARCKII.

*T. apice spiræ affixo, anterieus in tubum ascendentem porrecta, tenui, pellucida, luteo-rufescente* (Lam.).

*Vermetus lumbricalis*, Lam. Hist. An. s. Vert. vi. 2. p. 225; ed. 2. ix. p. 66 (non L.); Blainville, Dict. des Sc. t. lvii. p. 328; Chenu\*, Illustr. t. 5. f. 1 a-d.

*Hab.* Senegal (Lam.). The last part of Lamarck's diagnosis has very likely only reference to the erect part of the last whorl; else it must be specifically distinct.

Var.  $\beta$ . CARPENTERI.

*T. laminis per anfr. plerosque continuis, duabus æqualibus tenuioribus, a parietibus, parte axin versus, procedentibus, arcuatim medium versus continuis, interstitio haud pervio, extus*

\* Carp. (Cat. p. 306. lin. 18) makes some observations respecting Chenu's plates which are erroneous, as it is overlooked that Chenu has two plates marked "V."

*labrum versus carinatis; camera externa majore, reniformi; plica una centrali, columellari.*

Diam. spiræ .4, aperturæ .1 poll. (*Carp.*).

*Petalococonchus renisectus*, *Carp. Proc. Zool. Soc.* 1856, p. 315, f. 5.

*Hab.* In Oceano Indico (*coll. Cumingii*). Described from a large group of very regular growth, which from its accretions, Carpenter supposes to be East Indian. A large flat crust, which I suppose is the one described, does not show any other accretions except an imbedded *Isognomon*, very like the *I. perna*, L., represented by Dunker in *Moll. Guineensia*, t. 8. f. 10—a form I do not know as East Indian.

## 2. VERMETUS VARIANS, D'Orb.

*T. irregulariter convoluta, longitudinaliter rugoso-costata, vel lævigata, violaceo-fusca.*

“Coq. ornée de 6–7 sillons irréguliers.

“*L'animal.* La couleur en est violet foncé; la masse céphalique poussée latéralement, au contraire, très-foncé; l'opercule et le pied sont d'un violet très-pâle. Le manteau à sa partie antérieure est bordé de rouge de carmin; le reste du corps, en dedans, est simplement rosé en passant au jaune; on remarque néanmoins, à la partie supérieure, une large bande violette, médiane, accompagnée de chaque côté d'une autre moins foncée, qui se perd en approchant de l'extrémité du corps.”—*D'Orb.*

*Operculum* orbicular, thin, nucleus central (*Gray*); apparently paucispiral, like that of *Serpulorbis*\* made nearly flat (*Carp.*).

*Vermetus varians*, *D'Orb., Voy. l'Am. Mér.* p. 456, t. 44. f. 7–10.

*Serpuloides varians*, *Gray, fig. 4.* p. 83, t. 128. f. 1.

*Serpulorbis varians*, *D'Orb., Adams, Gen. i.* p. 357.

*Petalococonchus varians*, *Mörch, Journ. Conch. viii.* p. 41.

*Vermetus varians*, *Gray, Brit. Mus. Cat. (Moll. Am.),* p. 47. no. 405 (operculum); *Carp. Proc. Zool. Soc.* 1856, p. 315 (operculum).

*Hab.* Rio Janeiro; “tapissant le fond des plaques d'eau salée, sur les rochers des environs de Rio, au niveau des plus hautes marées de syzygies. Comme les lieux ne reçoivent de l'eau que tous les quinze jours, celle qui y reste est tellement concentrée, que souvent elle se cristallise sur les bords.”—*D'Orb.*

I have compared two rolled crusts from Montevideo (in the collection of Mr. Alfred Benson), which do not differ materially in exterior shape from var.  $\beta$  of the preceding species. The laminae, agreeing very well with figure 4 of Carpenter, are angulated on the edge; in one instance the larger lamina is rectangularly bent in the middle, both sides being equal. The lamina looks generally rather thick, particularly at the base.

It is doubtful if this species is in reality different from *V. adansonii*, *Daud.*, notwithstanding the differences in the description of the animal. Dr. Gray's and Carpenter's description of the lid is after *D'Orbigny's* original specimen.

\* Very likely a misprint, this genus having no operculum.

## Var. α. CARPENTERI.

*T. nigro-fusca, intus anfr. plurimis plicis solum instructis, pagina interna maxime nitente.*

Diam. spiræ ·3, ap. ·08 poll.

*V. varians*, D'Orb. ? B. M. Cat. ; D'Orb. Moll. p. 47. n. 405 (Carp.).

*Petalocoynchus varians?* D'Orb. Carp. Proc. Zool. Soc. 1856, p. 315. no. 4, fig. 4.

*Hab.* St. Vincent's (*W. B. Carp.*); Honduras (*Dyson*, teste Carp.).

## Var. β. OCCLUSA (THYLACODUS).

*T. solitaria, spiraliter torta, lateraliter affixa, anfr. contiguus ; anfr. ultimus partim porrectus ; apertura clausa dissepimento convexo castaneo, foramine centrali lineari-ovali, peritremate acuto.*

*V. glomeratus*, Sow. Gen. fig. 5 (quoad formam).

*Hab.* St. Thomas.

A single detached specimen in the collection of Mr. Riise. I have only found a rudiment of a thin lamina inside ; but it looks so closely like the typical form, that I do not doubt it is the same species. The slit in the septum is like that of *Fissurella nodosa*, Born.

## Var. γ. MONILE (THYLACODUS).

*T. solitaria, spiraliter torta, lateraliter affixa, fusco-purpurea vel violacea ; anfr. obliqui, irregulariter contigui, juxta suturam dilatati, liris 6-7 pallidis, lateralibus, approximatis, granulis pulcherrimis confertis ; sutura pallida, transversim rugosa ; striæ incrementi obsoletæ, confertæ, undulatæ ; anfr. ultimus juxta aperturam solutus, cylindricus, lævisculus, annulatim conferte rugulosus.*

Diam. ap. 3 m.

*Hab.* Honduras (*Dyson*, coll. Cuming.), in a valve of *Balanus tintinnabulum?*

The first whorls are lost ; in the inside of the present first whorl is to be seen a longitudinal strong keel ; but I cannot decide whether it corresponds to the central lira, or is produced by some malformation. The inside of the last whorl is pale brown, glossy, without any trace of plaits.

## Var. δ. IRREGULARIS.

*T. fusco-nigra, irregulariter contorta, transversim rugoso-plicata vel longitudinaliter sulcata, glomerata.* (D'Orb.)

“Coq. des plus irrégulières, formant une masse compacte, souvent très-étendue, composée d'individus contournés *obliquement en spirale*, toujours fixés dans toutes leurs parties, et appliqués, comme collés, les uns sur les autres d'une manière si confuse, qu'à l'exception des dernières circonvolutions, on ne peut pas les suivre séparément. Chacun est irrégulièrement plissé en travers, ou marqué des sillons longitudinaux pas réguliers et des plis. Couleur noir brun uniforme, quelquefois rougeâtre.

"*Vermetus irregularis*, D'Orb., Cuba, p. 235, no. 146 (vix t. 17. f. 16, 18); Brit. Mus. Cat. p. 14, no. 146.

"*Hab.* Cuba; Martinique, sur les rochers, dans les plaques d'eau, où elle a été recueillée par M. Condé."—D'Orb.

I am nearly sure that the group figured is a *Spiroglyphus*, perhaps mixed with a *Vermetus*.

Forma 1. ELECTRINA.

*T. parva plerumque solitaria, lateraliter affixa, spiraliter irregulariter torta, solida, subpellucida; anfr. angusti graciles, liris paucis validis nodulosis; apertura soluta.*

Although this form has quite the appearance of a distinct species, I find the transitions to the preceding so striking that I at present do not dare to separate it. It is chiefly distinct by the amber-like pellucidity of the substance, narrower whorls, and stronger liræ. I have never seen more than three or four specimens together. It is very likely analogous to *Bivonia contorta*, var. *indentata*, Carp.

Var. ε. ELECTRINA (VERMETUS).

*T. solitaria, repens, lateraliter affixa, spiraliter torta, aurantiaca; anfr. graciles plerumque contigui, liris validis 4-6; liræ incrementi æquidistantes in intersectionibus nodiferis, interstitiis foveatis; apertura soluta, resupinata, subcontracta; intus laminis duabus brevibus remotis juxta columellam instructis, lirula columellari mediana distincta.*

Diam. ap. 1 m.

*Hab.* Ins. St. Thomas (*A. H. Riise*).

I have only seen a few specimens with interior laminæ, from Mr. H. Krebs.

Var. ζ. ELECTRINA (THYLACODUS).

*Differt a præcedente anfr. reticulatis, liris obsolete nodosis, laminis internis nullis.*

*Hab.* St. Thomas, on *Lima scabra*, and on *Spondylus fimbriatus*, var. *aurantiaca*, just corresponding in colour to the *Vermetus* (Oersted).

Var. η. BADIA (VERMETUS).

*T. repens, laxè contorta, tenuiuscula; anfr. primi pallidi, liris parvis numerosioribus.*

*Hab.* St. Thomas, several detached specimens; an individual is affixed between two of the former variety (*A. H. Riise*).

Var. θ. CANDIDISSIMA (VERMETUS).

*T. candidissima nodulosa; anfr. primi isabellini; intus lamina brevissima in anfr. medianis; anfr. superne varicibus erectis 3-4.*

*Hab.* Ins. St. Thomas (*H. Krebs; Riise*).

## Var. 1. PERLATA (THYLACODUS).

*T. spiraliter torta, lateraliter affixa; anfr. ultimus depressiusculus, liris tribus lateralibus validioribus, nodulis validis sat approximatis in seriebus transversis digestis.*

*Hab.* St. Thomas (verisimiliter).

## Var. x. COSTATA (THYLACODUS).

*T. ut in præcedente sed albescens; anfr. versus suturam dilatati; nodulis confluentibus, inde transversim validissime crenato-costatis.*

Diam. ap.  $1\frac{3}{4}$  m.; diam. anfr. penult. circ. 4 m.

*Hab.* Jamaica, on *Chama macrophylla*, Ch. (Oersted).

This is the thickest and largest variety of this form.

## 3. VERMETUS CONICUS, Dillwyn &amp; Wood.

Shell subcylindrical, flexuose, and spiral at the base. Tube rather thick, *brownish white*, and coiled into a conical spire of about 8 whorls at the base; the summit rises about 9 inches from the rock to which the shell adheres; but the length is probably thrice as great, owing to the coils of the base; and the diameter of the tube is about  $2\frac{1}{2}$  lines (*Dillw.*).

*La Trompe d'Eléphant*, Favanne, p. 644 (t. 5. f. C), 1780.

*Serpula*, no. 6, Schröter, Einl. ii. p. 557.

*Serpula lumbricalis*, var.  $\beta$ , Gm. p. 3742.

*Tubulus testaceus solitarius anguinus*, Mart. i. f. 15.

*Hab.* The coast of America, adhering to rocks (*Favanne*); Amboyna (*Rumph.*).

The latter locality is added because it is on the plates of the *Amb. Rariteitkammer*; but as it is marked with a number, and not a letter, it was added by Schynvoel, and may be erroneous. Dillwyn evidently did not know this species, but has translated and extracted, somewhat erroneously, the description of Favanne. This is clear from comparing the measures given above with the following sentence of Favanne:—"Son élévation est de plus de trois pouces, mais sa longueur croît à plus de triple." The figure of Favanne is copied from Rumph. t. 42, no. 4\*; but the draughtsman has taken the shell (*Turbo?*) on which it is affixed for the first whorls of the *Vermetus*. This perhaps has induced Favanne to indicate eight whorls, as reproduced by Dillwyn, although it is also possible that this indication may have been taken from a specimen, as well as the indicated colour and locality. It is the latter circumstances, in connexion with the figure of Martini, which bring me to adopt Dillwyn's name for the following forms, described in the order of their age.

## Var. a. PERSONATA JUV. (THYLACODUS).

*T. lateraliter affixa, spiraliter regulariter torta, nitida, badia; anfr. 6-7 contigui obliqui convexiusculi, liris longitudinalibus obsoletissimis, striis incrementi prominentioribus, varicibus linearibus impressis in serie subobliqua dorsali digestis; anfr.*

\* Rumph. t. 41 no. 4, is very likely a *Bivonia*.

*pone varices inflati; anfr. ultimus solutus suberectus, peritremate inflexo, postice rotundato-lobato, inde apertura coarctata reniformi.*

Long. axis circ. 8 m.; diam. anfr. ult.  $1\frac{1}{3}$  m.

*Hab.* Ins. St. Croix, on *Isognomon alatum*, Gm., from the roots of the *Rhizophora mangle*, L. (*Oersted*); about 5 specimens. I have seen this form principally on the impressed linear varices and smooth surface of the first whorls of a specimen of the following form; the constricted aperture must then, of consequence, become dissolved with age.

Var.  $\beta$ . (THYLACODUS).

*T. pallide ferruginea vel albescens, lateraliter affixa, spiraliter torta; anfr. contigui tenuiusculi, liris longitudinalibus et rugis transversis reticulati; columella lira mediana et interdum utrinque lirula obsoleta remota; anfr. ultimus solutus, longus, tortus, pallidus, læviusculus; anfr. primi ut præcedentes; specimen vidi cujus anfr. primi planorbiformes.*

*Hab.* St. Croix, cum præcedente (*Oersted*).

Var.  $\gamma$ . (VERMETUS).

*T. cylindrica lateraliter affixa spiralis, anfractibus contiguis, sutura dilatata applanata pallida; columella lira mediana distinctissima, utrinque lirula obsoleta, in anfr. medianis (lateris affixi) laminis duabus latis, oppositis, hyalinis, lacteis, convexiusculis, margines fere attingentibus.*

Axis long. 27 m., diam. aperturæ 3 m.

*Hab.* cum præcedentibus.

The ten or twelve first whorls do not show any laminæ inside. In the thirteenth whorl is a pair of rudimental laminæ (perhaps broken off); in the two following whorls the laminæ are very broad, leaving a narrow slit between them, and dividing the interior into two unequal parts, of which the interior is about a third part. In the sixteenth whorl the laminæ are very short, leaving a large gap between them, and decreasing to a feeble line in the seventeenth and two following.

Var.  $\delta$ . GORDIALIS (VERMETUS).

*T. differt a præcedente anfractibus longissimis, irregulariter spiraliter tortis, glomeratis, foveolato-reticulatis; columella liris tribus æquidistantibus subæqualibus, lirulis obsoletis intercalantibus; laminæ internæ ut præcedentis.*

Diam. apert. 4 m.

*Tubulus marinus vermicularis, concameratus, striatus, notis nigris punctatus, lucidus, ex fusco rufescens*, Gualt. t. 10. f. Z.

*Serpula decussata*, Lam. v. p. 363. no. 7; ed. 2. v. p. 620 (non Gm.).

*Vermetus decussatus*, Blv. Dict. Sc. 1827, t. xlviii. p. 555 (*Serpula*).

*Vermetus decussatus*, Desh., Lam. ix. p. 65. no. 2.

*Vermicularia glomerata*, Gravenh. Tergest. p. 59. var. 2 a (ex specim. orig.?).

*Bivonia decussata*, Chenu, Man. p. 320, f. 2303 (verisimiliter).

*Hab.* Ins. St. Thomas.

The whorls of this form are exceedingly long and narrow; it is generally solitary, but frequently from two to four specimens are agglomerated. Gualtieri's figure is very good; but I do not understand the small black spots mentioned in the text and marked on the figure; perhaps they are produced by a foreign matter in the grooves. It has often twice as many whorls.

Var. ε. PROBOSCIS (THYLACODUS).

*T. solitaria affixa*, anfr. *depressis*, *suturis expansis*, anfr. *ultimo longo porrecto albescente*.

*Tubulus testaceus solitarius anguinus* (Mart. i. f. 15).

*Serpula conica*, Wood. Index, t. 38. f. 22, p. 186 (copy).

*Hab.* West Indies, on *Cytherea maculata* (Martini). St. Thomas (Riise).

Var. ζ. RETIFERA (ALETES).

*T. agglomerata*, *vertice affixa*, *spiraliter torta*, *castanea vel ferruginea*, *lineis transversis saturatoribus*; anfr. *fere ubique contigui*, *ampli (nec graciles)*, *lirulis longitudinalibus latiusculis nodulosis*, *interstitiis subæqualibus punctato-foveatis*; *rugæ incrementi regulares*, *in intersectionibus subnodosæ*; anfr. *ultimus longus, porrectus, cylindricus, pallidus*; *columella sæpe badia, lira elevata mediana*.

Diam. apert. circ. 5 m.; anfr. penult. circ. 8 m.

*Operculum tenue, flavum, superne concaviusculum, vix spirale*; *inferne area musculari plana subimmersa, peripheriam versus sulco divisa, opaca, concentrice conferte et subtilissime striata*; *limbo lato nitido convexo oblique striolato, sulcis obsolete concentricis 1 vel 2*.

Diam. 3 m.

*T. fœtalis (nondum nata)* *Bulimoidea, subcylindrica, apice bullato*; anfr.  $2\frac{1}{2}$ , *convexis, sutura profunda*; *apertura obliqua rhomboidea, inferne subeffusa*; *columella recta, inferne producta*; *labro superne leviter retuso*.

Long. circ.  $1\frac{1}{8}$  m.

Humphrey, Conchology, t. 10. f. 14, *sed anfr. ultimo incompleto*.

*Vermetus conicus*, Dillw., Mörch, Journ. Conch. vii. pp. 346 & 347, viii. p. 38.

*Hab.* St. Thomas, a group on *Strombus accipitrinus*, Mart. (Riise). Coll. Cuming.

This form is closely allied in sculpture to *Aletes centiquadrus*, and in shape perhaps differs from the var. *V. peronii*, Val., as represented in Chenu, Ill. pl. 4. f. 6, only in the rather smaller calibre of the tubes. On a group closely resembling Chenu's representation are several young ones, as described under var. α, affixed chiefly on the erect apertural tubes (Coll. Riise). I have seen this *Aletes* pass so

distinctly over into the preceding forms, that I do not doubt they are identical. Although I have no specimens to prove that a similar transition takes place between the forms called *Aletes* and *Vermetus* from the west coast of America, I do not doubt that this will be found to be the case on comparing larger suites of specimens.

On the upper side of the operculum are some cylindrical bodies lying on the side; but I suppose they are foreign bodies. The lobated edge mentioned in 'Journ. de Conch.,' from a single specimen, is only the effect of desiccation.

Var.  $\eta$ .

*T. ut præcedentis, sed substantia crassa.*

*Hab.* Ins. St. Thomas (*A. H. Riise*).

4. VERMETUS (THYLACODUS) CONTORTUS, Carp. 1857.

*Bivonia contorta*, Carp. Cat. p. 305. no. 355.

? *Vermetus glomeratus*, Mke. Zeitschr. 1857, p. 178. no. 4, and 1850, p. 165. no. 14; Adams, Panama, p. 216. no. 323?

*T. solitaria, lateraliter affixa (quondam), badia, tenuiuscula, irregulariter contorta; anfr. graciles, teretes, fere ubique æquales, irregulariter aliussuper alium decliviter et spiraliter incumbentes; anfr. primi plerumque contigui, ultimi disjuncti, lirulis longitudinalibus approximatis, rugis vel plicis incrementi decussatis, inde reticulati, intersectionibus obsolete nodulosis; anfr. ultimus porrectus læviusculus, pallidus, latere affixo ferrugineo rudi, irregulari; varice manicæformi in anfr. penultimo; columella in anfr. medianis liris 3-5 distinctis, harum tribus superioribus approximatis.*

Diam. aperturæ  $3\frac{1}{2}$  m. (ex specim. orig. Carpenteri).

*Hab.* Gulf of California (*Mus. Cuming*).

I have not seen any laminae inside, but, from the great resemblance of the 3-5 spiral liræ on the columella\* with those of the preceding species, I believe they will be found in other specimens. This species resembles most in shape var.  $\delta$  of *V. conicus*, Dill., but is a *Thylacodus*. The opercula, supposed by Mr. Carpenter to belong to this species, are more likely those of *Spiroglyphus albidus*, Carp.

Var.  $\alpha$ . REPENS (THYLACODUS).

*T. lateraliter affixa, irregulariter spiralis, solida; anfr. plerumque contigui ampliores quam in sp. præced.; anfr. ultimus longus, rectus, repens nec solutus; intus callo lineari lacteo.*

Diam. aperturæ 4 m.

*Hab.* Gulf of California, on *Margaritifera* (*Mus. Cuming*).

In the broken end the columellar lines are not to be seen distinctly, but only a white linear keel which seems situated on the walls of the whorl.

This species is perhaps a state of *V. (Petalocochnus) macrophragma*.

\* Not mentioned by Carpenter, because the shell was not opened by him.

Var.  $\beta$ . FAVOSA (THYLACODUS).

*T. lateraliter affixa, irregulariter spiralis, cerea; anfr. graciles interdum soluti, teretes, sæpe contigui vel tecti, hic illic varicibus brevissimis arcuatis erectis, superficie longitudinaliter seriatim pulcherrime favosa; foveæ plerumque hexagonæ e liris longitudinalibus conferte regulariter undulatis et rugis æqualibus transversis æquidistantibus formatis: anfr. primi graciliores, læviusculi, castanei.*

Diam. aperturæ  $2\frac{1}{2}$  m.

*Hab.* California, on *Crucibulum* (*Mus. Cuming*).

The surface of this shell is quite like that of a honeycomb. The two pair of sides of the hexagonal holes are formed by the undulation of the longitudinal liræ; the third pair is formed by transverse rugæ, exactly of the same size and form as the longitudinal liræ. Longitudinally the rows are quite regular, transversely the rows are oblique, or rather irregular. It is perhaps somewhat corroding. The sculpture and colour look so different from the type that it perhaps will prove to be a distinct species; but some parts show the same dark-brown colour as in the type, and the first whorls are very like those of the following variety, which I believe really belongs to the true *V. contortus*, Carp.

Var.  $\gamma$ . CONTORTULA (THYLACODUS).

*T. parva, cerea, irregulariter spiralis; anfr. graciles circiter 6-10 superne liris duabus remotissimis, lira externa obsoleta, rugis transversis cancellati; latere inferno irregulari, lapillis agglutinatis.*

Diam. aperturæ  $\frac{3}{4}$  m.

*Hab.* Gulf of California, affixed to the typical specimen.

Approaches, according to the description, *Bivonia* (?) *contorta*, var. *indentata*, Carp.

## Forma 1. THYLACODUS (?) CONTORTUS, var. INDENTATA, Carp.

“*T. Biv. contortæ simili, sed minore, colore haud rosea, sculptura indentata; costis paucioribus; interstitiis profundis, cancellatis.*”

*Bivonia* ? *contorta*, var. *indentata*, Carp. Cat. p. 307. no. 355.

*Hab.* Mazatlan; very rare on *Spondyli*, &c. (*Liverpool coll.*), Carp.

This form corresponds, according to the description, to forma 1. *electrina*, of *Vermetus varians*, D'Orb.

Var.  $\delta$ . INDENTATA (VERMETUS).

*T. parva, pallide aurantiaca, lateraliter affixa, irregulariter spiralis; anfr. obliqui, graciles, contigui, ad suturam dilatati, appressi, liris validis 4-5, liris transversis æquidistantibus lateraliter fortioribus; in anfr. medianis lamina plana tenui lata versus columellam instructa, in parte inferiore columellæ lamina brevi opposita.*

Diam. aperturæ  $\frac{1}{2}$  m.; long. axis circ. 7-9 m.

*Vermetus (Thylacodus) contortus*, var. *indentata*, Carp., Mörch, Mal. Blätter, 1860, p. 77. no. 69.

*Hab.* Sonsonate; two specimens on a rolled valve of a young *Spondylus limbatus*, Reeve (vix Sow.) (*Oersted*).

This variety corresponds exactly to *V. varians*, forma 1, var. *ε*. It differs chiefly in the position of the laminae, which does not look to be quite constant. *V. macrophragma* differs in having both laminae distinctly situated on the columella itself, while their position in the present species is not very evident. The median columellar lira is not so strongly marked as in *V. macrophragma*.

Var. *ε*. CORRODENS (VERMETUS).

*T. parva profunde corrodens; columella lira acutiuscula; laminis duabus acutis latiusculis in parietibus juxta columellam instructa.*

*Hab.* Ins. Sibo\* (*Spglr.*), on *Purpura lineata*, Lam.

The outside of the specimens is entirely destroyed. I refer this shell to the present species on account of the locality and the situation of the internal laminae.

5. VERMETUS RENISECTUS (Carp.), Mörch.

*Petalococonchus renisectus*, var. Carp. Proc. Zool. Soc. 1856, p. 315.

*T. badia, lateraliter affixa, spiraliter torta; anfr. obliquis subæqualibus, fere ubique contiguus, longitudinaliter leviter liratis, interstitiis læviusculis, præsertim versus aperturam, et in latere umbilicali lirula intercalante; rugæ incrementi regulares, rectæ, æquidistantes, sæpe in intersectionibus graniferæ; intus laminis duabus planis juxta columellam instructa; lira columellari mediana distincta; apertura circularis soluta.*

Diam. aperturæ 2 m.

*Vermetus glomeratus*, Rouss. Chenu, Ill. pl. 2. f. 2 d (quoad formam).

Var. *α*. (VERMETUS).

*Liræ obsoletæ; rugæ incrementi acutiusculæ, prominentes.*

*Hab.* Ins. Philippin., both varieties on a valve of *Radula vulgaris*, Link (*coll. Cuming*).

The shell shows on some places an amber-like pellucidity, like *V. varians*, forma 1.

Var. *β*. GORDIALIS (THYLACODUS).

*T. flavescens, fusco-cinerea, agglomerata, lateraliter affixa, spiraliter torta, anfr. obliquis plerumque contiguus, liris parvis regularibus, interstitiis obsolete punctato-scrobiculatis, rugis incrementi regularibus, approximatis; sutura pallida appressa; columella lira mediana acuta, utrinque liris duabus obsoletis remotis; apertura circularis soluta.*

Diam. 3 m.

\* Very likely intended to be Quibo.

*Vermetus glomeratus*, Rouss. Chenu, Ill. t. 2. f. 2 (sed anfr. ult. producto).

*Hab.* Ins. Philippin. This group is composed of four specimens, corresponding to var.  $\beta$  of *V. conicus*, Dill. If provided with plaits, they would correspond to var.  $\delta$ , *gordialis*, of the same species.

Var.  $\gamma$ . (THYLACODUS?) *anfr. ultimo longo porrecto.*

“*Testis subsolitariis, basibus in spiram attenuatam desinentibus, antice elongato-porrectis* (coll. Lam.)”—Lam.

*Serpula glomerata*, var.  $\beta$ , Lam. 1818, v. p. 363; ed. 2. v. p. 619.

*Vermetus glomeratus*, Rouss. Chenu, Ill. pl. 2. f. 2 a, d (f. 2 c is probably enlarged).

*V.* —, Desh. *Traité Conch.* pl. 79. f. 12?

*Hab.* — ?

Lamarck does not mention the locality of the variety which he supposes to be distinct from this typical form from l'Isle de France. In the ‘*Voyage de l’Astrolabe*’ (p. 298), *Vermetus carinatus* is compared with a specimen of *V. glomeratus* in the collection of the Museum at Paris.

Var.  $\delta$ . ASPERULA (THYLACODUS?).

*T. solitaria, lateraliter affixa, irregulariter spiralis, rufescens; anfr. contigui, liris approximatis lacteis, subtiliter nodoso-squamosis, interstitiis lirula parva intercalante, liris et rugis incrementi albescentibus, irregularibus, approximatis; anfr. ultimus partim erectus, albus, læviusculus, varice magna maniciformi, intus laminis incrementi tribus remotis; apertura suborbicularis lateralis, superne fornicata; columella lira mediana acuta.*

Diam. aperturæ 2 m.; long. axis circ. 27 m.

*Hab.* Ins. Philippin.; a single specimen on a valve of *Chama rubra*, Reeve (dente coccinea).

The aperture, which looks to be filled, is lateral, and covered above with a half-vaulted septum, corresponding to those described by Gray, and represented by Sowerby. The fine nodulous or scale-like sculpture seems to be dependent on the short spines of the *Chama*. The last whorl is nearly uniform bluish white.

Var.  $\epsilon$ . ASPERELLA (VERMETUS?).

*T. lateraliter affixa, spiralis, opaca, saturate badia; anfr. contigui, lirulis approximatis interruptis, rugis transversis geminis juxta suturam sæpe furcatis; columella lira mediana gemina vel bipartita, utrinque in parietibus callis duobus linearibus lacteis; apertura soluta erecta albescens.*

Diam.  $2\frac{1}{2}$  m.

*Hab.* Ins. Philippin.? two agglomerated specimens, with traces of a green stone on the attached side.

This is evidently of the same stamp as the preceding variety, but is of a dull-brown colour. The surface seems corroded, being riddled with numerous small narrow holes, as if marked by the point of a knife (*Mus. Cuming*).

Var. ζ. JUVENILIS, *apertura personata*.

*T. lateraliter affixa spiralis; anfr. circiter 10, contigui, castanei, læviusculi, malleati vix lirati, varicibus impressis in linea obliqua dorsali digestis; anfr. ultimus partim solutus suberec-tus; peritrema inflexum, lobo dorsali triangulari, dentiformi, obliquo, inde apertura cordiformi coarctatum.*

*Hab.* India, on *Tridachna squamosa*, Lam. (*Mus. Reg.*).

This shell differs only from the young of *V. conicus*, Dillw., var. α, in the posterior inflected lobe of the aperture, which is sharp and not rounded.

Forma 1. WOODWARDI, Carp.

This form is analogous to forma *electrina* of *V. varians*, and to forma *indentata* of *V. contortus*.

*Petalococonchus renisectus*, var. *woodwardi*, Carp. Proc. Zool. Soc. 1856, p. 316. no. 5 e.

*T. dense agglomerata, nigro-castanea, cinerascens, substantia dura; anfr. graciles, luxu contorti, in locis immersis annulatim rugosi, superne in locis apertis liris distinctis compressis, rugis incrementi plerumque parum prominentibus; apertura soluta, porrecta, circularis; anfr. intus nitide nigro-castanei, laminis duabus validis, marginibus reflexis juxta columellam instructis, lira mediana columellari plerumque valida.*

Diam. aperturæ  $\frac{1}{3}$ – $1\frac{1}{2}$  m.

*Operculum pallide flavum, superne concaviusculum, area centrali parva concava, lamina suberecta circumdata; inferne planum, area centrali parva immersa, centro, ut mihi videtur, nodulo irregulari.*

Diam.  $\frac{3}{4}$  m.

A specimen was found loose on the upper side of the group.

*Hab.* — ? A group with numerous specimens, about 9 dm. long and 6 broad, without locality, in Mr. Cuming's collection.

Among the tubes were found a *Bittium*, closely allied to *B. gibberulum*, C. B. Adams, but brown, thicker, and much shorter; two specimens of *Cæcum* (*Anellum*), sp., and a *Brochina* (*Volsella*), about  $5\frac{1}{2}$  m. long and 3 in height, very like *Myt. charpentieri*, Dkr. Moll. Guineens. t. ix. f. 12, and *Modiola subsulcata*, Reeve, f. 47, but without bristles, and with a thick epidermis reflected inside; also a variety of the same with obliterated radiating liræ on the dorsal side. This shell is very like to *Vermetus varians*, D'Orb., but the tubes are of a smaller calibre, and the liræ are sharper.

Var. η. WOODWARDI (THYLACODUS).

*Differt a præcedente anfractibus amplioribus, nitidulis, liris levioribus; color brunneus castaneus vel nigrescens.*

Diam. aperturæ circiter 2 m.

*Hab.* — ? A group about 11 dm. long and 6 broad, with a small *Ostrea* (sp. cardine utrinque denticulato), an example of *Polytrema*

*miniaceum*, Pall. ? and of a species of *Volsella* evidently the same as the smooth variety mentioned above, but partly white (long.  $5\frac{1}{2}$  m., alt.  $3\frac{1}{2}$  m.).

I have not noticed any internal laminæ, but there is a very feeble median columellar lira. The colour verges towards a dull ochreous in many specimens, and the grey tinge of the preceding is very feeble. It differs not more in size from the latter than the individuals of this group do mutually.

Var.  $\theta$ . EBENEA (THYLACODUS).

*T. solitaria, substantia dura, ebenea, nitidula, spiraliter torta; anfr. contigui, liris parvis remotis, rugis incrementi obsoletissimis, remotis, punctis asperis irregularibus in intersectionibus; anfr. ultimus prælongus glaber, zonis pallidis; columella lira mediana acuta.*

Diam. aperturæ 3 m.

*Tuyaux de mer nommé ville-brequin*, Davila, Cat. i. p. 562. art. 59. pl. iv. f. G (sed specim. paululum majora quam nostra).

*Hab.* Ins. Philippin.; two agglomerated specimens, one of which has a very long apertural tube.

This shell is perhaps more allied to var.  $\gamma$ ; but I put it here on account of the solid substance of the shell and the dark colour; the first whorls approach strikingly to one of the specimens of the last group.

Var.  $\iota$ . PICEA (THYLACODUS).

*T. solitaria, spiraliter torta, lateraliter affixa; anfr. graciles, parvi, liris validis circiter 4-5, striis incrementi acutis, inde liris subtiliter crenulatis; anfr. ultimus porrectus repens (corrodens?) pentagonus (?) substantia crassa.*

Diam. aperturæ vix 1 m.

*Vermilia subcrenata*, Chenu, Ill. tab. ix. f. F (simillima).

*Hab.* —? Four or five specimens on a young *Ostrea cumingii*, Dkr., which is found at the Philippines.

I cannot decide whether it is partly overgrown by the oyster, or corroding, which is less probable (*Mus. Cuming*).

Var.  $\kappa$ . INDENTATA (THYLACODUS).

*T. succinea, huc illuc badia; anfr. graciles, contigui, irregulariter spiraliter torti, liris validis 4-5, interstitiis plerumque læviusculis; liris transversis æquidistantibus (in locis occultis fortioribus), inde quadratim reticulata; apertura circularis.*

Diam. fere 2 m.

*Hab.* Ins. Philippin. (*Mus. Cuming*), specimen solitarium.

This form corresponds to forma 1 of *V. varians*, D'Orb.

Var.  $\lambda$ . MONILIFERA (THYLACODUS).

*T. lateraliter affixa, irregulariter spiraliter torta, pallide aurantiaca; anfr. graciles, contigui, liris 3-4 pulcherrime moniliferis, juxta suturam dilatati, liris transversis confertis; interstitiis*

*latis, obsoletissime cancellatis; in interstitio juxta umbilicum lirula minuta moniliformi; anfr. ultimus partim solutus, porrectus, cylindricus, læviusculus, albescens; apertura circularis.*

Diam.  $1\frac{1}{2}$  m.

*Hab.* Ins. Philippin., specimen solitarium (*coll. Cuming*).

Notwithstanding that the sculpture is very different, I place it for the present in this species. In respect to the sculpture, it corresponds to var.  $\gamma$  of *V. varians*, D'Orb., and to var.  $\iota$  of forma *electrina*, as regards size.

#### 6. VERMETUS NERINÆOIDES, Carp.

*T. V. renisecto simili, sed rubro-fusca, rugulis spiralibus pluribus, intus solida; laminæ ut in V. renisecto sitæ, sed validæ, labrum versus sæpe biangulatæ; camera externa minore.*

Diam. spiræ  $\cdot 3$ ; aperturæ  $\cdot 1$  poll. (*Carp.*).

*Petalococonchus nerinæoides*, Carp. Proc. Zool. Soc. 1856, p. 316. no. 6, f. 6; Adams, Gen. Supp. p. 626, t. 137. f. 10.

? *Vermicularia glomerata*, var. 1 c, Gravenh. Tergest. p. 58 (ex spec. orig.).

*T. dense agglomerata, irregulariter spiraliter torta, aurantiaca, fere ubique superficialiter cinerascens; anfr. disjuncti sed approximati, liræ compressiusculæ, obsoletissime contracto-nodosæ, interstitiis latiusculis, interdum latissimis; striæ et rugæ incrementi compressæ, confertæ; anfr. ultimus plerumque prælongus, lirulis parvis confertis; laminæ internæ validæ, in anfr. primis crassissimæ, margines angulatos sæpe fere attingentes, aperturam versus tenues, latæ.*

*Hab.* Australia (*coll. Cuming, Carpenter*).

In Mr. Cuming's group, which appears to be bleached, were found a *Rissoa*, and a 5 m. long. *Crypta aculeata*, Chemn., or one of the species generally confounded with it. As the latter shell is not known to me as Australian, I suppose the locality assigned to the species is erroneous.

Among the worm-tubes which, through the kindness of Professor Grube, I have on loan, is a group very like that of Mr. Cuming; but I could not discover any sections corresponding to Mr. Carpenter's drawing, although they approached very much to Mrs. Adams's figure, which seems to be taken from the Cumingian group. It is evident to me that the size of the chambers is not constant in one and the same specimen, as a comparison of Carpenter's and Adams's drawings, both very exact, sufficiently proves.

#### 7. VERMETUS OCTOSECTUS, Carp.

*Petalococonchus octosectus*, Carp. Proc. Zool. Soc. 1856, p. 317, f. 8.

*T. solitaria (gemina) lateraliter affixa, albescens, irregulariter spiraliter torta; anfr. obliqui subcontigui, lirulis longitudinalibus valde remotis; liræ et rugæ incrementi regulares, approximatae, validæ, inde superficie reticulata, lineolis transversis aurantiacis remotis; laminæ internæ latæ inæquales, camera externa parva*

*in anfr. primis, magna in anfr. ultimis; lira columellaris acuta, utrinque lirula minuta remotissima.*

Diam. anfr. ult. circ. 4 m.

*Hab?* S. Africa, Mus. Cuming (*Carp.*).

Var. *a.* DILATATA (VERMETUS et ALETES).

*Differt a precedenti anfr. planiusculis, sutura dilatata depressa, rugis transversis validis approximatis.*

*Hab.* Mare Rubrum (*Mus. reg.*) on *Arca foliacea*, Forsk., with Nullipores, like the preceding, which I suppose, with more probability, is from this locality.

I have seen specimens with and without internal laminæ attached on the same shell. One specimen shows on the outer wall a sharp keel pointing to the slit between the laminæ, which I have never elsewhere seen so well developed.

According to Carpenter, it differs from the following species in the absence of the "remarkable" structure at the base, and in the comparatively small size of the outer chamber: the former character is probably quite accidental, and the latter is not constant in one and the same species. The variety is still more like the *V. cereus*, which perhaps will itself prove to be merely a variety when more specimens have been compared.

#### 8. VERMETUS CEREUS, Carpenter.

*Petalococonchus cereus*, *Carp. Proc. Zool. Soc.* 1856, p. 316, f. 7, no. 7.

*T. solitaria, spiraliter torta, quondam lateraliter affixa; anfr. depressi, obliqui, planiusculi, contigui, aurantiaci, suturis depressis albis; anfr. ultimus solutus, cylindricus, porrectus, albescens, striis et rugis incrementi irregularibus; lateris affixi verrucis planis confertis in seriebus obliquis digestis (an impressione Corallii?); laminæ parietales sat tenues, breviusculæ; camera externa et interna subæquales; lira columellaris acuta. Aletes quoad magnitudinem.*

Diam. aperturæ  $4\frac{3}{4}$  m., diam. anfr. penult. 6-7 m.

*Hab.* Ins. Philippin. (*Cuming*); *Serpula*, Born, p. 435, tab. min., quoad formam.

The surface of Carpenter's above-described specimen looks as if it had been attacked by acid, and shows consequently no sculpture—not even striæ of growth. The small regular nodules on the white attached side, regarded by Carpenter as a distinguishing character between this species and *V. octosectus*, are no doubt the cast of an *Astæa*.

#### Var. *a.* GYMNOGASTRA (VERMETUS).

*T. solitaria, lateraliter affixa, irregulariter spiralis, flava; anfr. contigui lati, suturis expansis depressis, liris parvis confertis æqualibus; rugæ incrementi leviter flexæ, suturam versus incrassatæ; umbilicus apertus angulatus; laminæ internæ brevissimæ; lira columellaris valida acuta.*

Diam. aperturæ 4 m., anfr. ult. 5 m., anfr. penult. fere 7-8 m. *Aletes* quoad magnitudinem.

*Hab.* Ins. Philippin. (Mus. Cuming). The affixed side does not show any trace of the nodules of the type.

Var.  $\beta$ . TENUIS (ALETES).

*T. læte aurantiaca, tenuiuscula, lateraliter affixa, irregulariter spiralis; anfr. contigui convexi, suturis dilatatis albescentibus crenulati, liris parvis remotis; stricæ et rugæ incrementi validæ, suturam versus incrassatæ, dilatatæ, planæ; anfr. ultimus longus, solutus, rugis incrementi expressis, liris longitudinalibus obsoletissimis; apertura deflexa; lira columellaris compressa acuta.*

Diam. anfr. ult. 4-4½ m., anfr. penult. 5-6 m.

*Hab.* Ins. Philippin. (Mus. Cuming), on a *Heteropora*.

This variety is much thinner in the shell than the two preceding.

9. VERMETUS (THYLACODUS?) CARINATUS, Q. & G. 1833.

*T. glomerata, ovata, triquetra, carinata, transversim striata, cinerascens; apertura intus rotunda.*

“L'animal (dans l'esprit de vin) a une teinte brune, et d'assez longs tentacules pour sa grandeur, portant une ligne noire sur leur longueur.

“L'opercule est 'long' et peu profond.”—Q. & G. (fig. 26 enlarged).

*Vermetus carinatus*, Q. & G. Voy. l'Astr. ii. p. 298, t. 67. f. 24-26.

*Vermetus carinatus*, Mrs. Gray, Figs. i. t. 56. f. 1, 1 a.

*Siphonium carinatum*, Gray, fig. 4. p. 82; Adams, Gen. i. p. 357. lin. 12 (non lin. 6).

*Hab.* Island of Guam (Q. & G.).

I have seen forms, which I regard as intermediate between *V. octosectus*, Carp., and *V. cereus*, Carp., approaching to this.

10. VERMETUS LILACINUS, Mörch.

*T. aggregata, subcylindrica, spiraliter torta, pulcherrime lilacina; anfr. teretes contigui, ultimi sæpe soluti; sutura dilatata alba; liræ longitudinales obsoletæ remotæ parvæ; rugæ incrementi remotæ vel interdum approximatæ, suturam versus incrassatæ et furcatæ; anfr. ultimus solutus breviusculus; laminæ parietales brevissimæ (fractione?), ad columellam approximatæ; lira columellaris mediana acutiusscula.*

Diam. aperturæ fere 3 m.

*Hab.* Zanzibar (Coll. Dunkeri). A group of about sixteen specimens, attached to a *Bivonia*.

Var.  $\alpha$ . (THYLACODUS).

*Serpula*, Humphrey, Conch. t. xi. f. 17.

*Hab.* Zanzibar (Mus. Cuming); one small group of nine specimens, and a larger group composed of about thirty-five specimens, with some agglutinated green pebbles. The columellar lira is well marked, but I cannot discover any laminæ as in Professor Dunker's specimens. The young shells show a strong tint of brownish, and the adult have sometimes a few spots of the same colour. *Verm.*

*glomerata*, Sow. Gen., belongs perhaps to this species, according to the colour; but the liræ are too strong.

### Subgenus 2. PETALOCONCHUS, Lea.

*Laminis ab axi procedentibus.*

The typical species and the following are unknown to me; but I suppose, from their external similarity to *V. contortus*, that the position of the laminæ is similar, as it would seem to be from the section represented by Lea.

#### 11. VERMETUS (PETALOCONCHUS) SCULPTURATUS, Lea.

*T. vel contorta vel turrita, crassa, costulis longitudinalibus noduliferis, laminis internis politis, lævibus, ad aperturam obsoletis; apertura rotunda.*

Diam. .20 inch.

*P. sculpturatus*, Lea, Philad. Trans. 1843, ix. p. 230, t. 3. f. 54; Woodward, Man. p. 462.

*Hab.* Miocene of Petersburg, U.S. (*Lea*).

#### 12. VERMETUS (PETALOCONCHUS) DOMINGENSIS, Sow.

*T. contorta, crassa, tubulo plerumque spirali, anfractibus ad marginem inferiorem angulatis, angulo costulisque longitudinalibus graniferis, costulis nonnullis etiam infra angulum anfractuum graniferis.*

*P. domingensis*, Sow., Quart. Geol. Journ. 1850, vi. p. 51, t. 10. f. 9.

? *Steinkern ähnlich Nerinea*, Merian, Bericht Naturforsch. Basel, 1844, vi. p. 64.

*Hab.* Tertiary beds of St. Domingo (*T. S. Henniker*); ? Jamaica or Antigua (*Merian*).

Seems to be near *P. sculpturatus* (*Lea*), only his species does not appear from his figure to have any granular longitudinal ridges below the angle of the convolutions (*Sow.*).

#### 13. VERMETUS (PETALOCONCHUS) INTORTUS, Lam.

"*T. tereti-angulata, subcontorta, in spiram deformem contorta, subglomerata, plicis transversis crebris.*"—*Lam.*

*Serpula intorta*, Lam., 1818, v. p. 365. no. 16.

*Vermetus? intortus*, Desh. v. p. 623. no. 16.

*Serpula intorta*, Chenu, Ill. pl. 1. f. 6 et forte 6 a.

*Petalocochus intortus*, Sow., Moore, Lond. Quart. Geol. Journ. 1850, vi. p. 39; Bronn, Jahrb. 1852, p. 509.

*Hab.* Fossile des environs de Plaisance, et se trouve en France, près de Dax (*Lam.*).

#### Var. a. SUBAPENNINICA.

*T. subsolitaria, irregulariter spiraliter torta; anfr. contigui subquadrangulares, latere externo rectangulato, liris tribus æquidistantibus obsoletis, rugis transversis decussatis, inde obsoletissime foveolati; columella laminis duabus validis usque in*

*aperturam decurrentibus; laminæ superioris margine deflexo; varices maniciformes brevissimæ.*

*Wurmförmige Wurmröhre*, Knorr, Samml. v. Merkw. d. Natur, 1769, ii. 2. Abth. p. 288, t. 1 a. f. 9 (verisimiliter), from Piedmont.

*Serpula lumbricalis*, Brocchi, Conch. Subapenn.

*Vermetus intortus*, Bronn, Lethæa, iv. p. 283, t. 36. f. 18; Phil. Enum. ii. p. 144.

*Serpula lumbricalis*, Bronn, 269, Mus. Min. Hafn.

*Vermetus subglomeratus*, D'Orb. Prod. iii. p. 169 (ex Bronn).

*Hab.* Subapennine beds of Italy (Piedmont).

Var.  $\beta$ . CANCELLATA\*.

*T. irregulariter spiraliter torta; anfr. contigui, suturis depressis, planiusculi, latere externo superne lirulis duabus obsoletis interruptis, inferne liris duabus validis inæqualibus, lira superiore sæpe interrupta, latere umbilicali liris 3-4 æqualibus; laminæ internæ tenues inæquales, in anfr. primis a columella remotæ, in anfr. sequentibus in columella instructæ; rugæ incrementi prominentes approximatae, inde interstitiis foveolatis.*

*Vermetus intortus*, Hörnes, Geol. Reichanstalt Wien, t. . p. 16.

*V. rugosus*, Grateloup, Act. Bordeaux, ii. p. 161 (ex Bronn).

*Hab.* Tertiary beds of Baden, Lower Austria.

Var.  $\gamma$ . WOODII.

*T. plerumque gregaria, teres, subquadrata, arcte spirata, fere tota affixa, repens, striis transversis undulato-rugosis, lineis tribus longitudinaliter instructis, extremitate antica aliquando libera, porrecta.*

Diam. ap.  $\frac{1}{2}$  lin. (*S. Wood*).

Dale, Hist. and Antiq. of Harwich, 1730, t. xiii. f. 1.

*Vermetus intortus*, *S. Wood*, Cat. Annals, 1842; *Wood*, Crag, 1848, p. 113. t. 12. f. 8 a. vix f. 8 b.

*Hab.* Coralline Crag (*S. Wood*).

The centre line is the most prominent, and forms the base or keel of the volutions; so that only two are visible where the shell is regularly spiral, and one upon the base below. The shell, when perfect, is covered with rugæ in a transverse direction; but the terminal portion is smooth and free. In large masses the volutions are irregular and inconspicuous, though the young shell may frequently be traced by its regularly spiral form (*Wood*). The fig. 8 a seems to show moniliform liræ; fig. 8 b, from a group of the Red Crag, looks to be entirely different, and is probably a *Serpula*.

#### 14. VERMETUS (PETALOCONCHUS) PACHYLASMA, Mörch.

*T. solitaria, subcylindrica, irregulariter spiraliter torta, perforata, albescens; anfr. contigui planiusculi, inferne angulati, latere externo liris tribus pallide fuscis æquidistantibus, lira suturali parva, lira angulari validiore, interstitio superiore lirula parva*

\* *Vermetus intortus*, Karsten, Verz. Verst. d. Sternb. Gestein., 1849, p. 19, is perhaps to be referred to this variety.

*interrupta, latere basali plerumque occulta, interdum lirula parva; rugæ incrementi prominentes approximatae continuæ; anfr. ultimus candidus lævigatus, strato interno (casu?) denu-  
datus; columella superne lamina spirali validissima, margine deflexo acuto parietem interdum approximante; inferne carina rectangulata acuta in anfr. ultimis evanescente; lira mediana obsoleteissima; apertura irregulariter pentagona, columella superne carina valida acuta (i. e. laminae superioris terminatione) inferne liris duabus remotis.*

Diam. aperturæ circ. 4 m.

*Hab.* Guinea?

In the Royal Museum there is a dissected specimen, with the first whorls broken, very like Hörnes's figure, but somewhat larger, about 29 m. long., and 11 broad, with about sixteen whorls. It looks like a fossil; but the keels are feebly coloured, and the inside is glossy; on the third whorl from the aperture is a varix. The sculpture and form are quite those of the preceding; the chief difference is the enormous development of the superior lamina, which, in the first whorls (the seventh and sixth from the aperture), are rather thin, very thick in the middle whorls, and thinner again in the last whorls.

#### 15. VERMETUS (THYLACODUS) SUBCANCELLATUS, BIVON.

*T. solitaria, rarius gregaria, teres, arcte spirata, fere tota affixa, repens, fusca, striis transversis longitudinalibus subcancellata, extremitate antica aliquando libera, porrecta.*

*T. subspiralis, gyris frequentibus, fere tota adnata, repens, aut saltem antice breviter tantum porrecta, lineis elevatis transversis et longitudinalibus cancellata, fusca, rufa, aut lutescens.*

Diam. 1'''.

*Animal atropurpureum, tentaculis cylindricis, retractilibus, superioribus longiusculis, inferiora fere æquantibus. Operculum completum, tenue, planum.*

*Tubulus*, Buonanni, Recr. p. 93. ii. t. 2. f. 20 g.

*Le Gâteau des Vermisseaux*, Fav. i. p. 654 (non t. 10. f. 3).

*Tubuli vermiculares*, Petiver, Gazoph. i. t. 151. f. 11 (copy).

*Serpula glomerata*, Linn. S. N. xii. p. 1266. no. 80 (non edit. 10, nec Faun. Suec. nec Mus. Ludov. Ulr.).

*Vermetus glomeratus*, Hanl. Ips. Linn. Conch.

*Vermetus subcancellatus*, Bivona, l. c. p. 12 (ex Phil.); Phil. Enum. i. p. 172. no. 5, t. 10. f. 20; ii. p. 144; Poli & Delle Chiaje, t. 57. f. 18.

*Vermetus subcancellatus*, Mrs. Gray, Figs. i. t. 58. f. 3.

*Bivonia subcancellata*, Adams, Gen. i. p. 358; Gray, Guide, p. 127.

*Hab.* Frequentissima in toto littore Siciliae (*Philippi*). Mediterranean (*coll. Cuming, Dunker, et Mus. Min. Hafn. sp. orig. Philippi*).

I have examined five or six groups without finding any internal laminæ, as Sowerby and Moore appear to have done. In a com-

paratively few specimens I have found a distinct medial lira on the columella.

Var. *a.* OCCLUSA.

*Apertura clausa, septo convexo; foramen centrale parvum quadridentatum, prout ex figura videtur* (Poli & Delle Chiaje, t. 57. f. 19; Mrs. Gray, Figs. t. 58. f. 3).

*Vermetus subcancellatus?*, Gray, Annals, 1851, viii. p. 479, pl. 17 B. figs. 4-6; Froriep, Jahresb. 1852 (translation and copy).

*Hab.* African coast of the Mediterranean (Gray).

I have never met with this form among the numerous specimens I have seen. Sowerby's figure, of a bright-violet colour, showing very strong grooves, is very likely that of another species.

Var. *β.* SUTURALIS (PETALOCONCHUS).

*T. solitaria, lateraliter affixa, irregulariter spiraliter torta; anfr. plerumque contigui, obliqui, leviter depressi, flavi, versus suturam et umbilicum purpurascens, longitudinaliter regulariter lirati; liræ versus umbilicum fortiores, rugis transversis approximatis expressis decussatæ, inde granulatae in intersectionibus; laminae internæ inæquales; lamina superior plana vel leviter deflexa, juxta columellam instructa, lamina inferior suberecta, leviter arcuata, ad basin columellæ instructa; laminarum acie acuta, interdum leviter reflexa; lira mediana columellæ valida, acuta, alba, utrinque lirulis duabus obsoletissimis inæqualibus.*

Diam. aperturæ  $2\frac{3}{4}$ ; diam. anfr. ult.  $3\frac{1}{2}$  m.

*Hab.* On an old *Spondylus gæderopus*, L., probably from Morocco (*Mus. Reg.*).

This form is very like *V. nerinæoides*, Carp., in size and sculpture; but the grooves are more distinctly granulated, and the sutures with a dark-purplish band. The preceding form is very rarely of the size of this variety, which perhaps will prove to form a distinct species with the following.

Var. *γ.* SCOLOPENDRINA (VERMETUS vel PETALOCONCHUS).

*T. solitaria, lateraliter affixa, subregulariter spiralis; anfr. graciles, numerosi (circiter 36), obliqui, teretes, subæquales; anfr. primi triginta plani, liris tribus castaneis æquidistantibus, harum duabus suturalibus; anfr. ultimi sex convexi, liris 6-7 parvis inæqualibus; liræ incrementi approximatae, prominentes, regulares, intersectionibus nodiferis; interstitiis pallidis, sutura linea castanea; columella lira elevata mediana, superne lamina concava fere parietali, inferne lamina inflexa columellari.*

Goldfuss, t. 70. f. 18 b, quoad formam et magnitudinem.

*Hab.* On the same old *Spondylus gæderopus* as the preceding.

It differs chiefly from var. *β.* in its more slender whorls. *Vermetus renisectus* is very like it. In one specimen the first whorls are white and densely annulate, without longitudinal liræ.

## 16. VERMETUS (PETALOCONCHUS?) PARVULUS, Münster.

*T. exigua, in spiram conico-elongatam deformem convoluta, anfractibus irregularibus contiguis creberrimis.*

*Serpula parvula*, Münst., Goldf. Petr. i. p. 239, t. 70. f. 18, no. 66; Chenu, Illustr. Serp. t. 7. f. 7 a-c; M.-Edw., Lam. ed. 2. v. p. 631, t. 59.

*Hab.* In collibus Westphalicis. From the Greensand at Essen an der Ruhr, attached to the spines of *Echini*. Very small and brittle (*Goldf.*).

I refer this shell to the present place on account of its great exterior resemblance to the last.

## 17. VERMETUS (PETALOCONCHUS?) VERMICELLA, Lam.

"*Testis filiformibus, teretibus, transversim rugosis, flexuosis, in massam crassam congestis.*"—Lam.

"La coquille du Lispe, sur une longueur égale à la Vermet, a tout au plus une ligne de diamètre, et souvent beaucoup moins. Elle n'est tournée en spirale que dans sa partie inférieure, qui fait deux ou trois tours au plus. Sa surface n'est point cannelée, mais légèrement ridée en travers; et son ouverture ne débordé que de quelques lignes au dessus des corps qui lui servent d'appui. Sa couleur est jaunâtre."—*Adanson*.

*Le Lispe*, Adanson, Senegal, p. 164. no. 2, pl. 11. f. 2.

*Vermichelle de mer*, Fav. 1780, i. p. 649, t. 6. f. B. (copy).

*Vermetus glomeratus* v. *Lispe*, Daudin, Rec. p. 35.

*Serpula vermicella*, Lam. 1818, v. p. 365. no. 13; ed. 2. p. 622.

*Vermetus (Serpula) vermicella*, Blv. Dict. Sc. 1827, t. xlviii. p. 556.

*Vermetus Lispe*, Desh., Lam. ed. 2. ix. p. 65.

*Hab.* Ile de Gorée (*Lam.*).

"Elle est aussi commune que le Vermet autour de l'île de Gorée; mais on ne la trouve qu'entre les rochers sur lesquels la mer bat avec violence. Les masses qu'elle forme sont fort compactes, d'environ un à deux pieds de diamètre, et de 5 à 6 pouces d'épaisseur."—*Adanson*.

I have not seen any specimens from the quoted locality; but the great resemblance of Adanson's figure (chiefly the specimens at the top) with the next, induce me to refer it to this genus.

The variety *b* of Lamarck, "*Testis brevioribus, laxioribus, varie contortis*"—very likely the very shell represented in Chenu's Illustr. pl. 2. f. 8—is probably a *Serpula*. (Cfr. Blv. Dict. Sc. Nat. t. xlviii. p. 557.)

VAR. *a*. FILARIS (PETALOCONCHUS).

*T. parva sordide alba, interdum partim lilacina, præsertim intus, pulcherrime tincta, agglomerata vel solitaria, cylindrice vel laqueatim torta; anfr. teretes, gracillimi, plerumque contigui, substantia crassa læviscula opaca; anfr. ultimus partim solutus, porrectus, interdum repens; rugæ incrementi obsoletissimæ vel omnino evanescentes, interdum prominulæ, annulatæ; intus lamina plana distinctissima juxta medium columellæ instructa.*

Diam. ap. circ.  $\frac{1}{2}$  m. ; axis long. 6–9 m. ; diam. anfr. ult. circ.  $\frac{3}{4}$  m.

*Hab.* On the same old *Spondylus gæderopus* as *V. subcancellatus*,  $\beta$  &  $\gamma$ .

This shell has quite the aspect of a *Serpula* ; but it differs in the manner of its contortion and the internal lamina on the columella, which I have only seen in the middle whorls of three or four specimens. It answers quite in form, and nearly in position, to that in *V. subcancellatus* ; but I am not able to find the opposite one. The walls of the shell are exceedingly thick in proportion to the aperture, nearly corresponding to the radius of the aperture ; in a few specimens they are rather thin. Some specimens are coloured inside with a beautiful lilac, which is to be seen outside, but is there more feeble ; but I am not quite sure if this is not caused by the dying animal, as may sometimes be seen in shells, chiefly of *Purpura*. The reason why I do not distinguish this shell specifically is, partly because it differs only from “*le Lispe*” in its colour and locality, and partly because it may possibly be only the young stage of *V. subcancellatus*, var. *scolopendrina*, the first whorls of which show the same dull-white colour, but which is much more strongly annular. I have seen from ten to fifteen specimens. (*Mus. Reg.*)

#### 18. VERMETUS (PETALOCONCHUS?) SCALATUS, Eichwald.

*Tubulo cochleatæ scalæ instar contorto, sæpe angulato, erecto, basi affixo, anfractibus invicem concretis transversimque costatis, costis singulis, ternis quaternisve striis tenuissimis decussatis extremo apice in tubulum exiguum rectumque excurrente.*

Long. 2–3, raro  $\frac{1}{2}$  6''' , et lat. 2''' .

*Serpula scalata*, Eichw. Naturh. Skizze, p. 199 ; Lethæa Rossica, 1852, i. p. 49, pl. 3. f. 8.

*Vermetus intortus*, Bronn, Index, ii. p. 1362 ; ? Guettard, Mém. Acad. Roy. 1760, pl. 2. f. 11.

*Hab.* Tertiary beds near Zukowie, and in other parts of Volhynia.

“Les tubes sont toujours petits et contournés en spirale verticale : les tours sont également élargis, et tellement rapprochés qu'ils se réunissent les uns aux autres ; ils sont cylindriques, quelquefois un peu anguleux à cause de 2 ou 3 petites côtes longitudinales qui occupent toute la longueur des tubes ; les interstices entre les côtes sont striés transversalement, les stries sont très-fines, souvent à peine visibles ; on compte 8 tours sur la longueur du tube de 5 lignes ; quelquefois les tours sont encore plus étroits, et de 10–12 sur la même longueur. Selon Bronn *V. intortus*, Lam., quoique elle ne soit jamais fixée par le côté, comme celui-ci, mais par la base, de laquelle elle s'élève verticalement, n'est jamais comprimée comme celui-ci, mais cylindrique, également grosse dans toute sa longueur, et par conséquent pas plus grosse à l'extrémité supérieure. Outre cela, celui-ci n'atteint jamais au-delà de 6 lignes, le *V. intortus*, au contraire, est très-long. L'extrémité supérieure offre un bout tout droit, mais de la même dimension que les tours précédents ; il est lisse ou très-

finement strié, comme ceux-ci ; je n'ai jamais trouvé le bout comme dans les *Serpula tubulus* (Eichw.), avec lequel M. Bronn l'a réuni." —*Eichw.*

*Note.*—I place here the three following forms, only known to me from single specimens. They have some resemblance to the genus *Anellum* of the family *Cæcidæ*, which seems to have the same relation to *Vermetus* as *Spirorbis* to *Serpula*. Notwithstanding the peculiar annular sculpture and hyaline texture, I suppose they will prove to be forms of *Vermeti*, modified from growing in sheltered places. I have sometimes seen a somewhat similar sculpture and colour on the first whorls of *Vermeti conicus*, *varians*, and *renisectus*, but not so distinctly that I could with perfect security refer them to any fixed species.

19. VERMETUS (THYLACODUS) BALANI-TINTINNABULI.

*T. solitaria, lateraliter affixa, alba, nitescens; anfr. teretes, contigui, suturis profundis, costis acutis parvis subremotis æquidistantibus; anfr. ultimus partim solutus, suberectus, læviusculus; umbilicus pervius.*

Diam. ap. circ.  $1\frac{1}{4}$  m.

*Hab.* On a valve of *Balanus tintinnabulum* (Mus. Reg.).

Var. *a.* CRYSTALLINA.

*T. anfr. obliquis costis acutissimis, regularibus.*

*Hab.* Ins. Philippin.

20. VERMETUS (STREBLOCERAS?!) ANELLUM, Mörch.

*T. sinistralis, candida, spira affixa, spirorbiformis, umbilico aperto; anfr. pauci, ultimus solum adspectabilis, rapide crescens, periphæria dilatata, costis transversis acutis validis, leviter flexis; apertura soluta, subovalis, latere interno dilatato, recto, superne et inferne angulo recto.*

Diam. testæ circ. 2 m.; diam. ap.  $\frac{3}{4}$  m.

Var. *a.* *Costis acutis parvis confertis.*

Diam. testæ fere  $3\frac{1}{2}$  m.; aperturæ 1 m.

*Hab.* California, on *Haliotis tuberculatus* (Reeve), with *Siphonium megamastus* (Mörch).

This shell, which perhaps will prove to be the type of a new genus, is very like a large *Spirorbis* in shape; but it looks to me in the texture quite a Vermetid. The shape of the inside of the aperture is exceedingly like that of a *Separatista*. I refer this species provisionally to the genus *Strebloceras*, which I only know from Carpenter's description in these 'Proceedings,' 1858, p. 440.

Subgenus 3. MACROPHRAGMA, Carp. Cat. p. 308 (olim).

*Laminæ internæ versus medium columellæ instructæ; lamina superior acie angulata deflexa, extus bicarinata.*

*Operculum (specierum duarum) parvum, tenuissimum, corneum, læve, subplanatum, vix spirale.* (Carp. Cat. p. 308.)

## 21. VERMETUS (MACROPHRAGMA) MACROPHRAGMA, Carp. 1857.

*T. parva badia lateraliter affixa, sæpe erodens, spiraliter torta; anfr. primi planiusculi contigui, ultimi teretes laxè contorti, liris longitudinalibus satis expressis et approximatis, rugæ incrementi expressæ approximatae; anfr. mediani laminati, lamina superior latissima, primum simplex, dein angulo recto deflexo, extus carinis 1-3, harum 2 acutissimis; lamina inferior simplex, lirula mediana acuta, ad laminam inferiorem approximans.*

Diam. aperturæ ·07; spiræ ·23 poll. (Carp.).

*Petalococonchus macrophragma*, Carp. Cat. p. 309. no. 359; Proc. Zool. Soc. 1856, p. 313. fig. 1; 1856, p. 226; Mörch, Mal. Blätter, 1860, p. 670.

*Hab.* Mazatlan, not uncommon on *Uvanilla*, *Cuma*, *Murex princeps*, &c. Panama, on *Margaritifera*, Mus. Cuming (Carp.); on *Vermiculus eburneus*, Reeve (*Coll. Cuming*). Realejo, on stones, Oersted (*Mus. Reg.*). S. Diego, *Euraphia hembelii* adhærens, Carp. Proc. Zool. Soc. 1856, p. 226 (*Mus. Nuttal.*).

The *V. contortus*, Carp., is perhaps the adult stage of this species, which again possibly may be a form of *Aletes centiquadrus*, according to the analogy with the forms of *Vermetus conicus*, Dill., described above.

Sect. a, lamina columellaris infima intus laminam minorem gerens.

## 22. VERMETUS (MACROPHRAGMA) COCHLIDIUM, Carp.

*T. conferte agglomerata, subcylindrica, irregulariter spiraliter torta, badia; anfr. plerumque contigui convexiusculi, liris longitudinalibus validis regularibus, rugis incrementi angustis regularibus, intersectionibus sæpe nodiferis, interstitiis lirarum plerumque quadratim foveatis; anfr. ultimus partim solutus, porrectus, tortus, intus laminis duabus ab axi procedentibus, tenuissimis, superiore majore, huc illuc latissima, acie acuto, vel in angulum obtusum curvata, carinis duabus validis labrum versus instructa; inferiore minore plana, intus lamina parva obliqua instructa.*

Diam. spiræ ·2; aperturæ ·08 poll. (Carp.).

*Hab.* Australia (*Mus. Cuming*).

It appears that Mr. Carpenter regards the "third" smaller lamina "growing out of the lower flat lamina as homologous with the columellar median lira," which I do not believe is correct. I have not been able with certainty to ascertain the presence of the latter.

Var. a. (THYLACODUS).

*T. spiraliter torta, anfr. ultimo recto, longissimo, partim adnato, plerumque pallido, albescente, intus nudo; anfr. mediani columellæ lira submediana acuta, compressa, valida, perobliqua, superne et inferne lirula obsoletissima, callo obsoletissimo lineari (lacteo?) utrinque in parietibus versus columellam instructo.*

*Petalococonchus*, sp., Carpenter, Proc. Zool. Soc. 1856, p. 317. n. 9.

*Hab.* Tahiti (*Mus. Cuming*).

A small group, mostly composed of long, transversely wrinkled

tubes, broken at both ends, loosely agglomerated, of a pale colour, and without longitudinal liræ, shows a few spiral specimens, which in the exterior form quite agree with the preceding in sculpture and colour. It seems to me that the columellar and subparietal liræ correspond very well to the position of the laminae in the *P. cochlidium* from Australia. As Tahiti by all Continental authors is regarded as an Australian island, both groups are possibly from the same locality.

### 23. VERMETUS (MACROPHRAGMA) FLAVESCENS, Carp.

*T. dense agglomerata, parva, cylindrica vel laxe contorta pallide aurantiaca; anfr. plerumque contigui, liris validis æquidistantibus 3 vel interdum 4 in latere umbilicali; anfr. ultimi liris 4 vel 5 expressis; liræ incrementi regulares, expressæ, regulariter approximatae, inde liris crenulatis et interstitiis cancellatis et pulcherrime foveolatis; apertura subquadrangularis, soluta (in speciminibus incompletis), lamina valida, columellari; laminae internæ fere ut præcedentis speciei.*

Diam. spiræ  $\frac{1}{4}$ , aperturae .06 poll. (Carp.).

*Petalocochnus flavescens*, Carp. Proc. Zool. Soc. 1856, p. 314. no. 3. fig. 3.

*Hab.* Sicilia (*Mus. Cuming*), loc. verisimiliter erroneo.

This differs from the preceding chiefly in its smaller size, and in the colour appearing bleached as in younger specimens of *V. cochlidium*. The indicated locality is very likely erroneous. In the inside were found two young specimens of *Vermiculus dimorphus* (Mörch), a *Rocellaria*\* near *R. cuneiformis* (Spgl.), and a *Diplodonta*, closely allied to *D. semiaspera* (Phil.), but thicker in the shell, with thicker and more approached concentric ribs, but with feebler and indistinct granules. None of these genera appears to be known from the Mediterranean, except the second.

### Subgenus 4. ALETES, Carp. Cat. p. 300.

*T. differt a præcedentibus anfr. amplioribus, columella lira mediana obsoletissima; color plerumque rufescens, anfr. primi badii.*

*Operculum superne concavum, lamina spirali, anfr. 5-6, ultimo abrupto; inferne convexum nitidum, liris spiraliibus irregularibus; area muscularis opaca, sæpe irregularis (morbo?).*

*Animal ut Vermeti.*

The lid seems to me only different from that of *Vermetus* in size, in consequence of the larger calibre of the shell.

The variety  $\gamma$  of *Vermetus conicus*, Dill. (p. 342), would be referable to this subgenus, if I had not seen one and the same specimen successively in the different whorls change from *Vermetus* (*Petalocochnus*) to *Thylacodus*, and ultimately to *Aletes*. *Vermetus cereus*, has the size of an *Aletes*, but shows well-developed internal laminae.

\* In the calcareous tube, at some distance from the aperture, there is a ring of small-branched tubercles, not unlike those in the fleshy tubes of some *Solenes*.

## 24. VERMETUS (ALETES) CENTIQUADRUS, Val.

*T. lateraliter affixa, spiraliter torta; anfr. primi sat angusti, anfr. ultimus ampliatus, marginibus utrinque compressis, inde apertura utrinque auriculatim effusa; color pallide rufescens, fasciis angustis obscuris, interstitia lirarum impresso-punctata.*

*Vermetus centiquadrus*, Val. Voy. Venus, pl. 11. f. 1, 1 a, 1 a bis.

*Vermetus effusus*, Val. pp. , ; Chenu, Ill. pl. 5. f. 4 (the same specimen!).

*Aletes centiquadrus*, Val. Carp. Cat. p. 301. no. 352.

*Vermetus (Aletes) centiquadrus*, Mörch, Mal. Blätter, 1860, no. 70.

*Hab.* Puntarenas (Oersted).

The first whorls are of a dark-brown colour, and strongly sculptured with longitudinal liræ and transverse rugæ exceedingly like *V. contortus*, Carp., which I suppose to be only a form of this shell, judging from analogy with *V. conicus*, Dillwyn. The columella shows one exceedingly feeble median lira, scarcely to be seen except in a very favourable light, and two very conspicuous lateral liræ which seem to answer to the laminæ in *V. macrophragma*, but they must perhaps be more properly regarded as the margins of a thin layer covering all the interior of the whorls, except the larger medial part of the columella, which shows a slight difference in colour.

*Animal violaceum, capite obscuro antice rotundato, tentaculis breviusculis roseis; dorso convexo, utrinque acute carinato, a mesopodio canali profundo lato separato; propodium planum, foliaceum, parvum; tentacula pedalia remota (contracta) breviuscula, curvata, latere interno profunde longitudinaliter fissio, mammilla intermedia parva perforata; mesopodium minutum, cordiforme, bipartitum; pallium simplex, acutum, linea coccinea marginatum.*

The colour is deepest on the back, and more feebly bluish towards the margins of the foot.

## Var. α. MAXIMA.

*Vermetus panamensis*, Rousseau, Chenu, Ill. pl. 5. f. 1, 1 a, 1 b; Adams, Panama Shells, p. 216. no. 324; Menke, Zeitschrif. f. Mal. 1850, p. 165. no. 13; Adams, Gen. p. 358.

*Hab.* Panama (Adams); Mazatlan (Melchers).

This seems only to differ from the preceding in its smooth surface and deep transverse furrows. In Mr. Cuming's collection is a specimen labelled "Philippines," which I cannot distinguish from the fig. 1 b of Chenu. The *V. angulatus*, Rousseau, Chenu, Ill. pl. 5. f. 2 (copied Chenu, Manuel, p. 320. f. 2300), is possibly a white variety of this form. In Dr. Chenu's plates are two marked "pl. 5," which I suppose have given rise to the observations of Carpenter (Cat. p. 306), who very likely has not seen the plate with the name *V. panamensis* as rightly quoted by Menke and C. B. Adams.

Var. β. *Punctis impressis destituta.*

*Vermetus peronii*, Val. Voy. Venus, pl. 11. f. 2 (on *Strombus galea*?).

*Aletes centiquadrus*, Val. Carp. Cat. p. 302.

This shell scarcely differs from the type, except in the absence of the punctures; but as both states are frequently found on the same specimen, this cannot warrant specific separation. I have a slight doubt respecting this species, arising from the locality being only known from the shell on which it is represented, which perhaps is as likely to be a *Melo* as *Strombus galea*. It seems to me curious that a shell named after Péron should be from a place that he never visited.

Var.  $\gamma$ . SIPHONATA.

*T. rufa subcylindrica, spiraliter torta, verticaliter affixa; anfr. contigui, sutura dilatata, liris confertis obsoletissime nodulosis, interstitiis angustissimis sæpe impresso-punctatis; anfr. ultimus porrectus, solutus, leviter flexus, concentrice rugosus.*

Diam. aperturæ  $5\frac{1}{2}$  m.

*Vermetus peronii*, Rouss., Chenu, Ill. t. 4. f. 6.

*Hab.* Puntarenas (*Oersted*).

This variety is closely allied to *V. conicus*, Dill., var.  $\gamma$ , from which it only differs in its deeper colour and more irregular sculpture.

Var.  $\delta$ . TULIPA.

*T. lateraliter affixa, irregulariter spiraliter torta; anfr. obliqui, plerumque contigui; anfr. primi liris sat expressis, subremotis rugisque transversis æquidistantibus decussati, inde interstitiis regulariter scrobiculatis; anfr. mediani lati, læviusculi, sculptura evanescente, albo et violaceo variegati; anfractus ultimus castaneus, lirulis confertis obsoletis, rugis incrementi sigmoidis, irregulariter corrugatus, aperturam versus pallidus, lineis et tæniis pulcherrimis badiis vel ferrugineis, huc illuc lactescentibus.*

Diam. aperturæ circ. 12 m.; axis longitud. circ. 65 m.

*Vermetus tulipa*, Rousseau, Chenu, Ill. pl. 1. f. 2 (an 1 & 3?); Adams, Genera, p. 358.

*Hab.* Gulf of California, on a piece of a black *Pinna* (*Mus. Cuming*).

The figure 2 of Chenu is a pretty good representation of the colour of the last part of the last whorl; fig. 3 looks very different, but approaches in appearance that of the middle whorls of the described specimen.

Var.  $\epsilon$ . BRIDGESII.

*T. agglomerata, verticaliter affixa, irregulariter spiraliter torta; anfr. latiusculi plerumque contigui, liris et tæniis sæpe evanescentibus, rugæ incrementi versus marginem prominentes crassæ; anfr. primi 10-12 angusti, obliqui, depressiusculi, læviusculi, badii, liris obsoletissimis vel omnino evanescentibus, suturis pallidis.*

Diam. ap. 5-9 m.

*Hab.* Panama, on *Margaritifera* (*Mus. Cuming*); very likely the

group of Mr. Bridges mentioned by Carpenter, Cat. p. 306, in the note.

This variety is very like the last; but the colour is much obliterated, and the last whorl is partly free and erect. It is chiefly notable for the resemblance of the first whorls to *Vermetus contortus* and *V. macrophragma*, some specimens of which are found on the same shell.

25. VERMETUS (ALETES) SIPHO, Lam.

"*T. tereti, longa, undato-curva, basin versus obsolete cancellata; spira baseos congesta, subtus planulata.*"—Lam.

*Serpula siphos*, Lam. Hist. v. p. 367. no. 25; ed. 2. v. p. 626; Blainv. Dict. Sc. t. 48. p. 588.

*Vermetus siphos*, Rousseau, Chenu, Ill. pl. 4. f. 3 superior (nec 3 sinistr.).

*Hab.* L'Océan des Indes, à Timor (*Mus. nostr.*). Elle varie beaucoup, et néanmoins je la crois distincte de la *S. arenaria*, Lam.

Of the figures quoted by Lamarck, none agree with the description. Gualt. tab. x. f. 1, is *V. arenarius*, L.; and *le Massier* of Adanson, regarded by Deshayes (Lam. ix. p. 65) as the type, is not from Timor. *Siphonium nebulosum*, Dillw., cannot be called *longa, undato-curva*.

The upper figure 3 of Chenu's plate seems to me to correspond exactly with Lamarck's description; the figure 3 (left) is very likely *le Massier* of Adanson, and does not agree with the description, although it is possible Lamarck regarded it as a variety, as it really approaches to *V. arenarius*, to which Lamarck likens it.

26. VERMETUS (ALETES?) GRANIFER, Say.

Covered with longitudinal, contiguous, slightly elevated, granulated striæ. Shell subcylindric, contorted; inferior side flat; the whole surface is composed of very numerous, small, contiguous striæ, each consisting of a single row of granules; these series are alternately smaller. The continuity of the tube within is interrupted by oblique diaphragms: it sometimes approaches the spiral form; and one specimen has three complete volutions of much regularity.

Diam. of the largest specimen  $\frac{2}{5}$  inch.

*Serpula granifera*, Say, Philad. Journ. iv. i. p. 154, t. 8. f. 4.

*Vermetus? granifera*, M.-Edw., Lam. ed. 2. v. p. 632.

*Serpula granifera*, Bronn, Index, pl. 2. p. 1137.

*Hab.* Tertiary-beds of Maryland (*Say*).

According to the figure, this species must be closely allied to *V. centiquadrus*, var. *peronii*.

27. VERMETUS (ALETES?) TORTRIX, Goldfuss.

*T. lævis, elongata, irregulariter in spiram convoluta vel glomerata, antice ampliata, tumida, striis transversis subrugosis.*

*Vermicularia lumbricalis*, Münster, Petrefact. Deutschl. 1828, vi. p. 98.

*Serpula tortrix*, Goldf. i. p. 242, t. 71. f. 15; Bronn, Ind. ii. p. 1140.

*Vermetus*, sp., M.-Edw., Lam. ed. 2. v. p. 632.

*Serpula tortrix*, Chenu, Ill. t. 6. f. 7 a, b.

*Hab.* In tertiary sandstone near Traunstein, Bavaria (*Münster*); Nummulitique (*Bronn*).

The figure seems to be reversed. I refer this species to *Aletes* on account of its resemblance to the last species.

The following lists of the additions made to the Menagerie during the months of June, July, August, September, and October were read to the meeting :—

JUNE.

		Presented by
1 Black-backed Gull .....	<i>Larus marinus</i> .....	W. H. Leach, Esq.
1 Rhesus Monkey .....	<i>Macacus rhesus</i> .....	— Dyer, Esq.
11 Australian Finches .....	{ <i>Estrela bichenovii</i> } — <i>phaeton</i> .....	A. Denison, Esq., F.Z.S.
	{ <i>Poëphila cincta</i> .. }	
	{ .. }	
1 Water Tortoise .....	<i>Emys</i> — ? .....	A. Russell, Esq., M.P., F.Z.S.
1 Capuchin Monkey .....	<i>Cebus capucinus</i> ? ..	J. H. Gurney, Esq., M.P.,
1 Hen Harrier .....	<i>Circus cyaneus</i> .....	F.Z.S.
3 Water Ouzels .....	<i>Cinclus aquaticus</i> .....	John Hancock, Esq.
1 Laughing Kingfisher ...	<i>Dacelo gigas</i> .....	Alexander Huth, Esq.
1 Macaque Monkey .....	<i>Macacus cynomolgus</i> ..	Charles Simpson, Esq.
1 Great Black Cockatoo...	<i>Microglossa alecto</i> .....	Capt. Denham, R.N.
1 White-crested Cockatoo	<i>Cacalua cristata</i> .....	T. J. Arnold, Esq., F.Z.S.
1 Green Fruit-eating Pigeon	<i>Treron bichenovii</i> ? .....	The Maharajah Duleep Singh, F.Z.S.
1 Green-winged Pigeon ...	<i>Chalcophaps indica</i> .....	
1 Necklace Dove .....	<i>Turtur suratensis</i> .....	
4 Rain Quails .....	<i>Coturnix coromandelica</i> ..	
1 Indian Paradoxure .....	<i>Paradoxurus typus</i> ? ..	H.R.H the Prince of Wales.
1 American Grey Squirrel	<i>Sciurus cinereus</i> .....	
2 Crested Curassows .....	<i>Crax alector</i> .....	W. Duncan Stewart, Esq.
2 Red-billed Tree-Ducks ...	<i>Dendrocygna autumnalis</i> ..	
1 Spotted Salamander ...	<i>Salamandra maculata</i> ..	Mrs. Hopper.
1 Proteus .....	<i>Proteus anguinus</i> .....	Dr. Hugh Falconer, F.Z.S.
1 Brown Bear .....	<i>Ursus arctos</i> .....	Madame Didiée.
2 Haw Finches .....	<i>Coccothraustes vulgaris</i> ..	Purchased.
2 Japanese Deer .....	<i>Rusa japonica</i> .....	
4 Spotted Woodpeckers ..	<i>Picus major</i> .....	
1 Red-winged Parrakeet ..	<i>Aprosmictus erythro-</i> <i>pterus</i> .	
1 Brazilian Macaw .....	<i>Ara severa</i> .....	
1 Lory .....	<i>Eos</i> — ? .....	
1 One-streaked Falcon ...	<i>Astur monogrammicus</i> ..	
1 Snow-Bunting .....	<i>Plectrophanes nivalis</i> ..	Received in exchange.
2 Butcher Birds .....	<i>Lanius excubitor</i> .....	
2 Hoopoes .....	<i>Upupa epops</i> .....	
2 White-fronted Geese ...	<i>Anser albifrons</i> .....	
2 Brent Geese .....	<i>Bernicla brenta</i> .....	
1 Young Caiman .....	<i>Jacare</i> — ? .....	

Of these, *Estrela bichenovii*, *Estrela phaeton*, *Poëphila cincta*, *Microglossa alecto*, *Rusa japonica*, and *Astur monogrammicus* were stated to be exhibited for the first time.

## JULY.

		Presented by
1 Indian Snake .....	<i>Chrysopelea ornata</i> .....	A. W. W. Baudernaiké, Esq.
2 Chinese Sheep .....	<i>Ovis aries</i> , var. ....	The Secretary at War.
1 Scotch Hare .....	<i>Lepus variabilis</i> .....	R. Drummond, Esq., F.Z.S.
1 Laughing Kingfisher .....	<i>Dacelo gigas</i> .....	Capt. Watson.
1 Boa .....	<i>Boa</i> — ? .....	H. Justins, Esq.
8 Snakes .....	<i>Ablabes punctatus</i> .....	} A. Downes, Esq.
	<i>Chlorosoma vernale</i> .....	
	<i>Tropidonotus fasciatus</i> .....	
5 Bull-frogs .....	<i>Rana mugiens</i> .....	} F. J. Rooper, Esq., F.Z.S.
8 Frogs .....	<i>Rana sylvatica</i> .....	
2 Seals .....	<i>Phoca vitulina</i> , juv. ...	J. R. A. Douglas, Esq.
1 Vervet Monkey .....	<i>Cercopithecus delalandii</i> .....	J. Monteiro, Esq.
1 Genet .....	<i>Genetta abyssinica</i> (?) .....	A. M. Harris, Esq.
1 Vulpine Phalanger .....	<i>Phalangista vulpina</i> .....	} Sir William Holmes.
1 Curassow .....	<i>Crax alector</i> .....	
1 Trumpeter .....	<i>Psophia crepitans</i> .....	
7 Hoopoes .....	<i>Upupa epops</i> .....	
1 Phalanger .....	<i>Phalangista vulpina</i> .....	
1 Vervet Monkey .....	<i>Cercopithecus delalandii</i> .....	
2 Common Wrens .....	<i>Troglodytes parvulus</i> .....	
1 Raccoon .....	<i>Procyon lotor</i> .....	
1 Bay Antelope .....	<i>Cephalophus badius</i> .....	
1 Australian Hawk .....	<i>Hieracidea berigora</i> .....	
1 Japanese Eel .....	<i>Anguilla</i> — ? .....	
2 Leverets .....	<i>Lepus timidus</i> .....	} In exchange.
1 White-crested Cockatoo .....	<i>Cacatua cristata</i> .....	
1 Philantomba Antelope .....	<i>Cephalophus maxwellii</i> .....	
3 Scarlet Tanagers .....	<i>Pyrranga rubra</i> .....	
2 Blue Robins .....	<i>Sialia wilsoni</i> .....	
1 Pine Grosbeak .....	<i>Corythus enucleator</i> .....	
1 Aoudad, fem. ....	<i>Ovis tragelaphus</i> .....	
1 Blood-breasted Pigeon .....	<i>Phlogænas cruenta</i> .....	
1 Curassow .....	<i>Crax globicera</i> .....	

Of these, *Chrysopelea ornata*, *Cephalophus badius*, *Hieracidea berigora*, and *Phlogænas cruenta* were stated to be exhibited for the first time.

## AUGUST.

		Presented by
1 Peregrine Falcon .....	<i>Falco peregrinus</i> .....	Dr. Bree.
1 American Black Bear .....	<i>Ursus americanus</i> .....	G. R. Faulkner, Esq.
1 Ursine Opossum .....	<i>Dasyurus ursinus</i> .....	F. J. C. Wildash, Esq.
1 Rhesus Monkey .....	<i>Macacus rhesus</i> .....	C. A. Long, Esq.
1 Marmozet Monkey .....	<i>Hapale ædipus</i> .....	H. Probyn, Esq., R.N.
2 Common Macaques .....	<i>Macacus cynomolgus</i> .....	Capt. Barwood.
6 Natterjack Toads .....	<i>Bufo calamita</i> .....	Dr. Lankester.
1 Peregrine Falcon .....	<i>Falco peregrinus</i> .....	H. B. Bingham, Esq.
3 Wood Owls .....	<i>Syrnium aluco</i> .....	} Percy S. Godman, Esq.
2 Honey Buzzards .....	<i>Pernis apivorus</i> .....	
1 Toco Toucan .....	<i>Ramphastos toco</i> .....	H. E. Governor Wodehouse.
1 Curassow .....	<i>Crax alector</i> .....	Dr. W. Huggins, Corr. Mem.
1 Tortoiseshell Turtle .....	<i>Chelonia imbricata</i> .....	} Admiral Sir H. Keppell.
3 Marmozet Monkeys .....	<i>Hapale iacchus</i> .....	
1 Touraco .....	<i>Corythæix buffoni</i> .....	

## AUGUST (continued).

1 Marmozet Monkey .....	<i>Hapale iacchus</i> .....	Presented by C. A. Staples, Esq. J. Radford, Esq.
1 Virginian Owl .....	<i>Bubo virginianus</i> .....	
3 Musk-Deer .....	<i>Moschus stanleyanus</i> ...	} Hon. J. C. Ellis.
3 Land Tortoises .....	<i>Testudo</i> — ? .....	
2 Water Tortoises.....	<i>Emys</i> — ? .....	} Mrs. Charles Wheeler.
2 Pennantian Parrakeets ...	<i>Platycercus pennantii</i> ...	
3 Rhesus Monkeys .....	<i>Macacus rhesus</i> .....	J. Bardsley, Esq.
2 American Alligators .....	<i>Alligator lucius</i> .....	Capt. George Bruce.
1 Vulpine Opossum .....	<i>Phalangista vulpina</i> ..	C. C. Dawson, Esq.
1 Sparrow-Hawk .....	<i>Accipiter nisus</i> .....	Samuel Smith, Esq.
1 Turtle Dove .....	<i>Turtur risorius</i> .....	J. W. Larking, Esq.
1 Eagle from Vancouver's Island.	<i>Haliaëtus leucocephalus?</i>	— Lambe, Esq., R.N.
2 Seals .....	<i>Phoca vitulina</i> .....	} Purchased.
2 Titlarks .....	<i>Anthus pratensis</i> .....	
1 Flamingo, young .....	<i>Phœnicopterus</i> — ?...	
4 Ortolan Buntings .....	<i>Emberiza hortulana</i> ..	
4 Leverets.....	<i>Lepus timidus</i> .....	} Received in exchange.
1 Hobby .....	<i>Falco subbuteo</i> .....	
5 Noctule Bats.....	<i>Vesperugo noctula</i> .....	
1 Young Bear .....	<i>Ursus isabellinus?</i> .....	
1 Javan Brahmin Kite .....	<i>Haliastur indus</i> .....	

## SEPTEMBER.

4 Magellanic Geese .....	<i>Chloëphaga magellanica</i>	Presented by His Excellency Capt. T. E. L. Moore, R.N.
1 Steamer Duck .....	<i>Micropterus cinereus</i> ...	
1 Japanese Deer .....	<i>Cervus sika</i> .....	E. Blyth, Esq., Corr. Mem.
1 Jerboa .....	<i>Dipus jaculus</i> .....	Hon. Mrs. Stuart.
1 Indian Parrakeet.....	<i>Palæornis alexandri</i> ...	G. Dann, Esq.
1 Marmozet Monkey .....	<i>Hapale iacchus?</i> .....	T. Young, Esq.
1 Sloth Bear .....	<i>Prochilus labiatus</i> .....	Capt. Stanley.
1 Bonnet Monkey .....	<i>Macacus pileatus</i> .....	H. N. Dupree, Esq.
2 Small Guans .....	<i>Ortalida katraca</i> .....	} Dr. Wm. Huggins, Corr. Memb.
1 Painted Sun-Bittern ..	<i>Eurypyga helias</i> .....	
1 West-Indian Rail.....	<i>Aramides cayanensis</i> ...	} W. Shorto, Esq.
10 Chameleons .....	<i>Chamæleo africanus</i> ...	
1 Kestrel .....	<i>Tinnunculus alaudarius</i>	A. Dodd, Esq.
1 Land Rail.....	<i>Crex porzana</i> .....	} Purchased.
1 Red Antelope .....	<i>Cephalophus rufilatus</i> ...	
1 Plantain-Eater .....	<i>Musophaga violacea</i> ..	
1 Blue Water-Hen .....	<i>Porphyrio martinica</i> ...	
1 Sable Antelope .....	<i>Hippotragus niger</i> .....	} Received in exchange.
6 Garter Snakes .....	<i>Tropidonotus ordinatus</i>	
1 Indian Rat-Snake .....	<i>Coluber blumenbachii</i> ...	
4 Little Bustards .....	<i>Otis tetrax</i> .....	

Of these, *Micropterus cinereus* and *Hippotragus niger* were stated to be exhibited for the first time.

OCTOBER.

		Presented by
1 Ichneumon.....	<i>Herpestes griseus</i> .....	} C. Clifton, Esq., F.Z.S.
2 Nightingales .....	<i>Luscinia philomela</i> .....	
4 Bohemian Chatterers ..	<i>Ampelis garrula</i> .....	E. S. Preston, Esq.
2 European Wolves .....	<i>Canis lupus</i> .....	Capt. Spain, R.N.
1 Pig-tailed Macaque .....	<i>Macacus nemestrinus</i> ..	W. Brooks, Esq.
7 Loach.....	<i>Cobitis barbatula</i> .....	W. Rose, Esq.
1 Bonnet Monkey.....	<i>Macacus pileatus</i> .....	Mrs. Charles Foster.
1 Domestic fowl (cock in hen plumage).	<i>Gallus domesticus</i> .....	R. F. Tomes, Esq.
1 Entellus Monkey .....	<i>Presbytes entellus</i> .....	Charles Ashby, Esq.
1 American Black Bear ..	<i>Ursus americanus</i> .....	} Capt. Herd, H.B.C.S.
1 Musquash .....	<i>Fiber zibethicus</i> .....	
1 Golden Agouti .....	<i>Dasyprocta aguti</i> .....	Capt. M. O. Stewart.
2 Dormice.....	<i>Myoxus avellanarius</i> ..	G. R. Lake, Esq.
1 Common Swan .....	<i>Cygnus olor</i> .....	Duke of Northumberland.
1 German Fox .....	<i>Vulpes vulgaris</i> .....	Mrs. Barston.
1 Alexandrine Parrakeet ..	<i>Palæornis alexandri</i> ..	P. Jolin, Esq.
1 Rhesus Monkey.....	<i>Macacus rhesus</i> .....	— Brooke, Esq.
1 Herring Gull .....	<i>Larus argentatus</i> .....	E. T. D. Cotton, Esq.
2 Canadian Geese.....	<i>Anser canadensis</i> .....	Capt. Wishart.
1 Rhesus Monkey.....	<i>Macacus rhesus</i> .....	Capt. Rainy.
2 Marmozet Monkeys .....	<i>Hapale iacchus</i> .....	Capt. N. F. Edwards, R.N.
2 Bearded Titmice .....	<i>Paroides biarmicus</i> .....	} Purchased.
1 Merlin .....	<i>Falco aesalon</i> .....	
1 pair of Sand Grouse .....	<i>Pterocles alchata</i> .....	
4 Cedar-Birds .....	<i>Ampelis cedrorum</i> .....	
1 Yellow-bellied Snake ..	<i>Hoplocephalus superbis</i>	
2 Australian Vipers .....	<i>Pseudechis porphyriaca</i>	
2 Flying Opossums .....	<i>Petaurus breviceps</i> .....	
1 Bonnet Monkey.....	<i>Macacus pileatus</i> .....	
2 Mealy Redpolls .....	<i>Linota canescens</i> .....	
1 Domestic Turkey .....	<i>Meleagris gallopavo</i> .....	
1 Sparrow-Hawk .....	<i>Accipiter nisus</i> .....	

November 26, 1861.

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

Mr. B. Leadbeater exhibited the heads of three stags shot by Lieut.-Col. Sarel, F.Z.S., in the Gardens of the Imperial Summer Palace at Pekin. The species to which they were referable seemed to be a true *Cervus*, allied to, if not identical with, *C. elaphus* of Europe, and chiefly differing from that species in the shortness of the head.

Dr. P. L. Sclater exhibited original drawings, by Mr. G. T. Vigne, of the Koch or Wild Sheep of the Sulimani range (*Ovis cycloceros*) and the Sha of Little Thibet (*Ovis vignii*), the distinctions between which had been pointed out by Dr. Sclater in his article on this subject in the P.Z.S. for 1860 (p. 126). In reference to these animals, Mr. Vigne observed that he had always supposed the *Koch* and the





Set at lit.

M & N. Hanhart, Imp.

GRUS MONTIGNESIA, (J.W.)

*Sha* to be the same animal, but that he now believed them to be distinct, in accordance with the observations contained in Dr. Sclater's paper. Mr. Vigne's drawings of the Koch (*Ovis cycloceros*) had been taken at Derabend, from a tame specimen, in May 1836; that of the Sha's head, from a specimen obtained near Iskardol in Oct. 1838.

The following papers were read:—

1. NOTES ON THE BREEDING AND REARING OF THE CHINESE CRANE (*GRUS MONTIGNESIA*) IN THE SOCIETY'S GARDENS. BY A. D. BARTLETT.

(Plate XXXV.)

Near the middle of May a pair of these birds formed a rude nest of dry rushes on the ground; and soon afterwards two eggs were laid. The parent birds took turns upon these eggs during the time of incubation. On the 24th of June a young Crane was hatched, the period of incubation having been thirty days.

The young bird was well covered with down of a light-brown or fawn colour, with darker markings on the back; it was short on its legs, and the bill also appeared short; in fact, it appeared less like a Crane than I expected to see it. It was able to walk about as soon as it was hatched, but appeared feeble, and now and then fell or rolled over in its attempts to follow its parents.

The old birds attended to the young one with much care, and furiously attacked everything that came near the place; they collected worms and beetles, &c., from all parts of their enclosure, which they brought in their bills towards the young bird, and after mutilating all living food, they would hold it near the young bird, who would advance and pick it from their bills, or from the ground as soon as it was dropped by them. The young Crane never opens its mouth and cries for food like the Storks or Herons and many other young birds, but utters a rather loud note, like *peep, peep, peep*, not unlike the chick of a common fowl; it is not, however, as adroit and able to obtain its food as the young of the Gallinaceous birds generally are; and consequently the parent birds are far more attentive, and watch every opportunity of obtaining food and preparing it for the young one. I have frequently seen the old birds offer a piece of biscuit (that the young bird found was too large to swallow), and they then would place it upon the ground, and by repeated blows break it up in small pieces, and then drop these close to the young bird, who would pick them up and swallow them. From these observations I am induced to consider that the Cranes (*Grus*) occupy an intermediate position between those birds that feed their young like the Herons and Storks, and those groups, like the Bustards and Plovers, whose young are at once able to run about and seek their food.

Perhaps the most remarkable thing is the rapid growth of the young Crane, which is very surprising. As I have before stated, at first the legs are short; in fact, as compared with the parents, the

bird is remarkably small, and few persons would guess what it possibly could be; in a few days, however, the legs begin to grow rapidly, and the neck and bill become elongated, and the bird quickly appears a Crane in shape.

From the time of hatching the female alone broods upon or nestles the bird, although the male takes turn in the task of incubation; and I notice the female does not squat down on the young one to brood, but sits down on the ground near it, and the young bird immediately walks behind her; she then raises her long black plumes, between which he creeps, and passes forward under one of her wings, until quite out of sight; her plumes are then lowered into their ordinary position.

There is a beautiful example of the progressive growth from the first down to the perfect feathers to be seen on the young of this bird. I have in many birds observed this, but not to so great an extent. It appears that the first down is not thrown off, but continues to grow longer, until the perfect feather is developed, having the early down attached at its point: this condition is to be seen not only on the points of the primaries, but also on the ends of the feathers of the entire plumage. Thus the bird for some time carries his early dress on the outside of his second plumage. The rapid growth of the plumage can be best understood from the fact that on the 27th of September it was found necessary to catch the young bird in order to cut the primaries of one of its wings (which I exhibit), to prevent its flying away. The bird by this time almost equalled its parents in size, and now is assuming the colour of the adult.

## 2. ON A COLLECTION OF FISHES SENT BY CAPT. DOW FROM THE PACIFIC COAST OF CENTRAL AMERICA. BY DR. ALBERT GÜNTHER.

A small collection of Fishes transmitted to the Society by its Corresponding Member, Capt. Dow, from the Pacific coast of Central America, has proved to be one of great interest, not only because it contains an unusually large proportion of new species, but also because it illustrates a very strange fact with regard to the geographical distribution of the class of Fishes. Several instances of one and the same species occurring on both the Atlantic and Pacific sides of Central America have been known to me for several years. Nevertheless when Mr. Fraser sent home his last collection, made on the Pacific side of the isthmus, and when I found several West Indian species of fishes in it, I was much surprised, and rather inclined to assume that accidentally some confusion had taken place. Every doubt, however, is removed by this last arrival, of Capt. Dow's collection, containing five species out of fourteen which are identical with Atlantic forms, namely:—*Batrachus surinamensis*, *Salaria atlanticus*, *Clinus delalandii*, *Mugil proboscideus*, and *Fistularia tabaccaria*. It is, however, worthy of remark, that nearly all the

species belong to genera living near the coast, and freely entering fresh waters.

The ichthyic fauna of the western coasts of America, between 8° north and 8° south of the Tropic of Cancer, offers a remarkable assemblage of types which belong to very different geographical regions; representatives of the faunas of North-west America, of the Pacific coasts of South America, of Japan, and of the Sandwich Islands, and of the Atlantic being mixed with a great number of forms peculiar to the area mentioned.

We give, first, a list of the species contained in Capt. Dow's collection:—

1. *Apogon dovii*, n. sp.
2. *Gobius paradoxus*, n. sp.
3. — *seminudus*, n. sp.
4. *Euctenogobius sagittula*, n. sp.
5. *Batrachus surinamensis*, Bl. Schn.
6. *Blennius brevipinnis*, n. sp.
7. *Salarias atlanticus*, C. & V. var. (see Gthr. Acanth. iii. p. 243).
8. *Clinus delalandii*, C. & V.
9. — *macrocephalus*, n. sp.
10. *Auchenopterus monophthalmus*, n. sp.
11. *Mugil proboscideus*, n. sp.
12. *Myxus harengus*, n. sp.
13. *Fistularia tabaccaria*, L.

14. *Halichæres*, sp.—The species appears to be new; but the single specimen sent is in too bad a condition to admit of a description.

With the exception of the first species, the others are included in my 'Catalogue of Acanthopterygian Fishes,' vol. iii., for which the following accounts have been prepared.

#### APOGON DOVII.

D. 6 |  $\frac{1}{9}$ . A.  $\frac{2}{8}$ . L. lat. 25. L. transv. 3/9.

A roundish black spot on each side of the root of the caudal; the spinous dorsal colourless, transparent; uniform olive (in spirits). Head densely punctulated with brown. Only the hind margin of the posterior præopercular ridge is serrated. Dorsal fins nearly equal in height.

The height of the body is one-third of the total length (without caudal), the length of the head two-fifths; eye large, its diameter being more than one-third of the length of the head. Palatine and vomerine teeth present. The upper jaw overlaps slightly the lower; maxillary extending backwards to below the posterior third of the orbit. Operculum with an upper flexible point, and with a lower stiff spine. The third dorsal spine is a little longer than the second, one-half of the length of the head. Caudal fin slightly emarginate, with the angles rounded.

Total length 26 lines.

This species is so closely allied to *A. inermis*, from the Mediter-

reanean, that perhaps it would be better not to separate it; the only difference which we can find is the form of the soft dorsal fin, which is considerably higher than the spinous in the Mediterranean species.

**GOBIOUS PARADOXUS.**

D. 6 | 11. A. 9. L. lat. 14.

The head and the trunk are entirely naked to between the second dorsal and the anal, the remainder is covered by ctenoid scales of moderate size; there are nine or ten of them in one of the anterior transverse series. The height of the body is contained five times and two-thirds in the total length, the length of the head four times and a quarter. Head nearly as broad as high, its width being rather more than one-half of its length. Eyes rather close together, of moderate size. Snout obtuse, rounded, as long as the eye; cleft of the mouth slightly oblique, with the jaws equal in length, and with the maxillary extending to below the middle of the eye. Teeth in villiform bands; there are two curved canine teeth on each side of the lower jaw. The first dorsal spine is elongate, filiform, sometimes extending to the base of the caudal; caudal rounded, shorter than the head; none of the pectoral rays silk-like; the ventral terminates at a great distance from the vent. Blackish (in spirits), caudal and ventral fins black; the dorsal filament whitish.

**GOBIOUS SEMINUDUS.**

D. 6 | 15. A. 10.

Head and anterior portion of the trunk naked; sides with exceedingly small scales, becoming somewhat larger posteriorly. The height of the body is one-sixth of the total length, the length of the head one-fourth. Head with the cheeks swollen, depressed, broader than high, its width being two-thirds of its length. Eyes close together, directed upwards, of moderate size; snout obtuse, as long as the eye; cleft of the mouth slightly oblique, with the jaws equal anteriorly, and with the maxillary extending to below the middle of the eye. Teeth in villiform bands, the anterior of the lower jaw slightly enlarged; there are two small curved canine teeth on each side of the lower jaw. Dorsal fins rather low, the hind part of the spinous dorsal being scarcely lower than the anterior; caudal rounded, as long as the pectoral; none of the pectoral rays silk-like; ventral rather short, terminating at a great distance from the vent. Blackish, fins and sides of the head dotted with black; ventrals black.

The largest of the specimens examined is two inches long. The species has such peculiar characters that it will be readily recognized. It has no natural affinity to the other small-scaled Gobies, which generally have an elongate form.

**EUCTENOGOBIOUS SAGITTULA.**

D. 6 | 13. A. 14. L. lat. 58.

Twenty longitudinal series of scales between the dorsal fin and the

anus, twelve between the anterior portion of the second dorsal and the anal. The height of the body is one-eighth of the total length, the length of the head five times and two-thirds. The head is as high as broad, its width being somewhat more than one-half of its length. Eyes very close together. Snout obtuse, shorter than the eye, the diameter of which is one-fourth of the length of the head. Cleft of the mouth slightly oblique, with the jaws equal anteriorly, and with the maxillary not extending to below the centre of the eye. Head naked; scales on the nape and behind the axil very small, becoming larger posteriorly. The second dorsal spine is the longest, somewhat lower than the body underneath, but higher than the soft dorsal; caudal rather elongate and pointed, two-ninths of the total length. Pectoral shorter than the head; the ventral terminates at a great distance from the vent. Light greenish olive with a series of four brown spots along the middle of the tail; sides of the head with some irregular blackish-violet blotches; dorsal, caudal, and pectoral fins dotted with black, ventral and anal immaculate.

This species has a second series of very small teeth within the maxillary front series; these internal teeth do not appear to be fully developed, but destined to replace those in function. The teeth of the lower jaw form a very narrow band anteriorly, and stand in a single series posteriorly.

**BLENNIUS BREVIPINNIS.**

D.  $\frac{11}{12}$ . A. 15-16.

The height of the body is nearly equal to the length of the head, and contained four times and a half in the total. The snout is obtuse, with the upper profile very oblique. Jaws without a curved tooth. Orbital tentacle slender, fringed at the base. The dorsal fin commences in the vertical from the operculum, is deeply notched, and not continuous with the caudal. The pectoral is longer than the ventral, and extends on to the vent. Greyish-brown (in spirits), with a darker lateral band.

	lines.
Total length.....	18 or 23
Height of the body.....	4 or 5

**CLINUS MACROCEPHALUS.**

D.  $\frac{22}{12}$ . A.  $\frac{2}{24}$ . C. 13. P. 13. V.  $\frac{1}{3}$ .

The height of the body is contained seven times and a half in the total length, the length of the head five times. The head is depressed, rather short, nearly as broad as long; crown of the head broad and flat; interorbital space concave, narrower than the orbit. Snout very short, obtuse, rounded; the maxillary does not extend to behind the posterior margin of the orbit; lips thick. The teeth in the jaws form a band with an outer series of stronger ones; vomerine teeth in a narrow band; palatine teeth none. No orbital tentacles; those at the nostril and on the neck very small. Gill-openings wide, the gill-membranes being united at the throat. Head naked;

scales on the body not very small, cycloid. The dorsal fin commences at the occiput, and terminates near the base of the caudal: the spines are flexible, and much-lower than the soft rays; the three anterior ones are rather more remote from one another than the following: none of the rays of this or of the other fins are branched. Caudal rounded. The anal is higher posteriorly than anteriorly, about as high as the spinous dorsal. Pectoral rounded, with the middle rays longest, shorter than the head. Ventrals jugular, half as long as the pectoral, with the spine and the outer ray enveloped in a common thick membrane. Dark greyish olive; head and fins blackish; head, base of the pectoral, anterior part of the body, and dorsal dotted with white.

	lines.
Total length . . . . .	61
Height of the body . . . . .	8
Length of the head . . . . .	12
Greatest width of the head . . . . .	11
Depth of the head . . . . .	7½
Length of the caudal fin . . . . .	10
——— of the pectoral fin . . . . .	10½

#### CREMNOBATES (BLENNIIDÆ).

(Substituted for *Auchenopterus*, which is preoccupied.)

Body moderately elongate, with the scales small or of moderate size. Snout rather short, with the cleft of the mouth of moderate width. A band of small teeth in the jaws; teeth on the vomer. Two separate dorsals, composed of spines only; the anterior short, formed by three spines. Ventrals jugular, composed of three rays. Head with tentacles; gill-opening wide.

#### CREMNOBATES MONOPHTHALMUS.

D. 3 | 27. A.  $\frac{2}{19}$ . V. 3. L. lat. 38.

A fimbriated superciliary tentacle; a small one at the nostril and on each side of the nape, both multfid. A black ocellus, edged with white, on the posterior quarter of the dorsal fin.

*Description.*—This fish is very similar to *Cristiceps argentatus* in general habit, but may be readily distinguished by the dorsal fin, which is entirely composed of spines. Head and body are oblong and compressed; the length of the former is one-fourth of the total, the height of the latter one-sixth. The cleft of the mouth is of moderate width, with the lower jaw slightly prominent, and with the maxillary extending beyond the vertical from the centre of the orbit. The teeth in the outer series are stronger than those in the narrow band behind; vomerine teeth apparently in a single series; palatine teeth none. The orbital tentacle is shorter than the eye, with three or four ciliæ; the nasal and nuchal tentacles are still shorter. The pectoral is nearly as long as the head, rounded, with the middle rays longest; ventral slender, somewhat shorter than the pectoral, with the outer ray longest. The first dorsal fin commences in the verti-

cal from the præopercular margin; the two anterior spines are a little higher than the second dorsal, and flexible; the membrane behind the third spine extends backwards to the base of the second fin. All the spines of the second fin are stiff and pungent, of nearly equal length, the anterior ones being a little shorter; the membrane of the last spine terminates immediately before the base of the caudal, leaving that fin quite free. Caudal rounded, one-seventh of the total length. The anal commences below the seventh spine of the posterior dorsal, and terminates before the caudal; it has two spines anteriorly. The scales are of moderate size; the lateral line runs closely along the dorsal profile, is bent downwards behind the pectoral, and proceeds along the middle of the tail to the caudal.

Brownish, irregularly marbled with darker; anterior dorsal blackish; a black ocellus, edged with white, on the nineteenth and twentieth spines of the posterior dorsal.

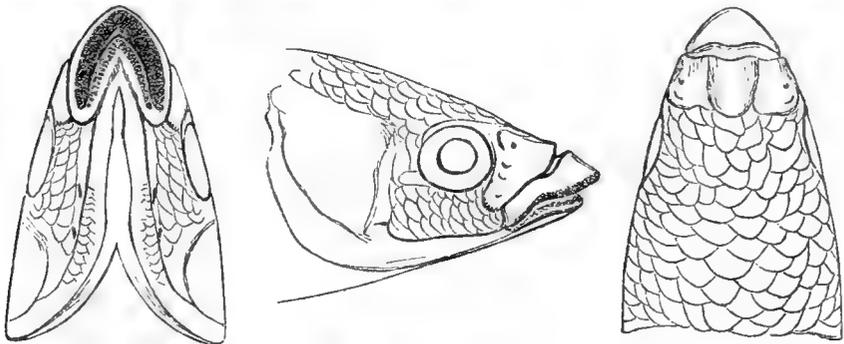
Total length 2 inches.

#### MUGIL PROBOSCIDEUS.

D. 4  $\frac{1}{8}$ . A.  $\frac{3}{10}$ . L. lat. 38. L. transv. 14.

The front part of the upper lip is extremely thick, conically produced; the lower parts of both lips with a band of soft pavement-like papillæ, arranged in oblique series. Cleft of the mouth deeper than broad.

*Description.*—This species is naturally more closely allied to *Agonostoma plicatile* than to *Mugil*, but differs from it in having no teeth at all in the jaws, except that in one specimen the band of papillæ passes into a series of fine moveable teeth anteriorly in the upper jaw. The head and especially the body and tail are compressed; the greatest depth of the body nearly equals the length of the head, and is contained four times and a half in the total length. The upper anterior profile is nearly straight, obliquely descending. The interorbital space is convex, one-half of the length of the head, and scaly, whilst the parts before the orbits are naked. The anterior portion of the upper lip is extremely thick, conically protruding, and nearly as long as the remainder of the snout. A narrow band of soft papillæ occupies the lower parts of the lips anteriorly and



*M. proboscideus.*

laterally; the papillæ are arranged in oblique series, having a pavement-like appearance. The lower jaws are rather narrow, and the cleft of the mouth is much longer than broad. The maxillary is entirely hidden by the præorbital, which has the extremity truncated and minutely serrated. The eye is much shorter than the snout, and in the present specimen, which apparently is a young one, one-fourth of the length of the head. There are twenty-three scales between the snout and the spinous dorsal fin. The latter commences somewhat nearer to the base of the caudal than to the end of the snout: the soft dorsal and the anal have series of small scales between the rays; the former is higher than the spinous dorsal, and commences above the middle of the anal fin. Caudal emarginate; the anal is rather higher than long, as high as the soft dorsal. The pectoral is inserted above the middle of the depth of the body, and its length is four-fifths of that of the head.

Silvery, upper parts greenish; dark stripes along the series of scales.

#### MYXUS HARENGUS.

D. 4 |  $\frac{1}{8}$ . A.  $\frac{3}{10}$ . L. lat. 38.

A single series of small fixed teeth in the upper jaw, none in the lower or on the vomer; lips thin. Præorbital serrated anteriorly and inferiorly. Anterior dorsal spines of moderate length, half as long as the head.

Head and body are compressed, the greatest depth being about one-fifth of the total. The cleft of the mouth is rather broader than deep, and does not extend to the anterior margin of the orbit. Sides and belly bright silvery; back green.

### 3. ON A NEW SPECIES OF FINCH, OF THE GENUS SYCALIS, FROM MEXICO. BY PHILIP LUTLEY SCLATER, M.A., Ph.D., F.R.S., SECRETARY TO THE SOCIETY.

In a small collection of Mexican birds lately sent to me for examination by M. Parzudaki, of Paris, I find a little Finch of the genus *Sycalis*, which I propose to call—

#### SYCALIS CHRYSOPS, sp. nov.

*S. brunnescenti-olivacea, capite obscuriore substriato: interscapulio, alis et cauda nigricantibus, fusco marginatis: loris, oculorum ambitu tectricibus subalaribus et corpore subtus flavis, pectore medio et lateribus obscurioribus, fuscescentioribus: rostro et pedibus fuscis.*

Long. tota 4·0, alæ 2·6, caudæ 1·6 poll. Angl. et dec.

*Hab.* In Mexico merid.

*Obs.* Affinis *S. arvensis*, sed staturâ minore et loris ciliisque aureis distinguenda.

This bird is interesting as the first species of the genus *Sycalis*





recorded from the country north of Panama. It was, however, to be expected that the Trans-Panamanic province of the Neotropical region would produce representatives of this, as of other peculiar South-American genera. *Sycalis chrysops* belongs to the same sub-group as *S. arvensis*, but may readily be distinguished from it by its diminutive size.

4. DESCRIPTIONS OF TWELVE NEW SPECIES OF AMERICAN BIRDS, OF THE FAMILIES DENDROCOLAPTIDÆ, FORMICARIIDÆ, AND TYRANNIDÆ. BY PHILIP LUTLEY SCLATER, M.A., PH.D., F.R.S., SECRETARY TO THE SOCIETY.

(Plate XXXVI.)

Fam. DENDROCOLAPTIDÆ.

1. LEPTASTHENURA PARANENSIS, sp. nov.

*Synallaxis ruficapilla*, Burm. Cab. Journ. f. Orn. 1860, p. 250.

*Murino-brunnea, subtus paulo dilutior, gutture albicantiore : alis extus et cauda tota rufis : pileo rufescente : rostro superiore nigro, inferiore ad basin fusco : pedibus nigris.*

Long. tota 6·0, alæ 2·2, caudæ 3·3, rostri a fronte 0·35, tarsi 0·7 poll. Angl. et dec.

*Hab.* In rep. Argentinâ.

I have a single example of this *Synallaxis* presented to me by Mr. O. Salvin, who received it in exchange from Prof. Burmeister. It is marked *Synallaxis ruficapilla*, but is very different from the true *Synallaxis ruficapilla* of Vieillot, and belongs to the section of the *Synallaxinæ* typified by *Synallaxis ægithaloides*, with which it agrees completely in form; so that I have placed it under the same generic head—*Leptasthenura*.

The tail has 12 rectrices, as in *L. ægithaloides*, the first pair being only 1·2 (inch) in length, and each pair gradually increasing. The medial pair are not quite so sharply pointed as in the latter species. The colour of the tail-feathers is uniformly rufous, with the shafts blackened except towards the base. The structure of the beak, wings, and feet resembles that of *L. ægithaloides*; but the tarsi in the present species are rather longer\*.

2. PHILYDOR SUBFULVUS, sp. nov.

*Anabates* — ?, Sclater, P. Z. S. 1858, p. 456.

*Saturate brunnescenti-olivaceus : cauda tota castanea : superciliis ad nucham productis, et corpore subtus fulvis, hoc lateraliter fuscescentiore sed ad gulum dilutiore : tectricibus subalaribus*

\* Since reading this paper, I have convinced myself that this species is not different from *Synallaxis fuliginiceps*, Lafr. et D'Orb. (a species also found by Professor Burmeister at Parana), and that my specimen was wrongly labelled "*S. ruficapilla*,"—an error which unfortunately induced me to regard it as new.

*et remigum pogoniis interioribus pallide fulvis: rostro corneo, mandibulæ inferioris basi et pedibus flavicantibus.*

Long. tota 6·7, alæ 3·7, caudæ 2·8.

*Hab.* In rep. Æquatorianâ, ad Gualaquiza (*Fraser*).

The single example obtained by Mr. Fraser at Gualaquiza in Ecuador is the only specimen I have yet seen of this *Philydor*. The species most nearly resembles *Philydor pyrrhodes* (Cab.), but wants the conspicuous pale cinnamomeous rump of the latter species, and is also much paler in colouring below. I possess examples of the following eight species, which I refer to this group of the *Dendrocopaptidæ*.

(1.) PHILYDOR SUPERCILIARIS.

*Sphenura superciliaris*, Licht. Doubl. p. 41.

*Anabates atricapillus*, Max. Beitr. iii. p. 1187.

*Xenops caniveti*, Less. Cent. Zool. pl. 16.

*Xenops melanocephalus*, Less. Tr. d'Orn. p. 318.

*Anabates superciliaris*, Burm. Syst. Ueb. iii. p. 28.

*Anabates atricapillus*, Bp. Consp. p. 211.

*Philydor superciliaris*, Spix, Av. Bras. i. p. 73, pl. 73. f. 1; Cab. et Hein. Mus. Hein. ii. p. 29.

*Hab.* Brazil.

(2.) PHILYDOR RUFUS.

*Dendrocopus rufus*, Vieill. Nouv. Dict. xxvi. p. 119.

*Sphenura poliocephala*, Licht. Doubl. p. 41.

*Philydor ruficollis*, Spix, Av. Bras. i. p. 74. pl. 75.

*Dendroma caniceps*, Sw. Orn. Dr. pl. 80.

*Xenops rufifrons*, Less. Tr. d'Orn. p. 317.

*Dendroma poliocephalum*, Hartl. Verz. Mus. Brem. p. 27.

*Anabates poliocephalus*, Burm. Syst. Ueb. iii. p. 29.

*Anabates ruficollis*, Bp. Consp. p. 211.

*Philydor rufus*, Cab. et Hein. Mus. Hein. ii. p. 29.

*Hab.* Brazil.

(3.) PHILYDOR PYRRHODES.

*Anabates pyrrhodes*, Cab. in Schomb. Guian. iii. p. 689.

*Philydor pyrrhodes*, Reichb. Handb. i. p. 200; Cab. et Hein. Mus. Hein. ii. p. 29.

*Hab.* Rio Napo.

(4.) PHILYDOR SUBFULVUS.

*Hab.* Ecuador.

(5.) PHILYDOR STRIATICOLLIS.

*Anabates striaticollis*, Sclater, P. Z. S. 1857, p. 17.

*Hab.* New Granada.

## (6.) PHILYDOR AMAUROTIS.

*Anabates amaurotis*, Temm. Pl. Col. 238. f. 2 ; Bp. Consp. p. 210 ;  
Burm. Syst. Ueb. iii. p. 29.

*Hab.* S.E. Brazil.

## (7.) PHILYDOR ERYTHROCERCUS.

*Anabates erythrocercus*, Pelz. Sitz. Akad. Wien, xxxiv. p. 105.

*Hab.* Cayenne.

## (8.) PHILYDOR RUFICAUDATUS.

*Anabates ruficaudatus*, Lafr. et D'Orb. Syn. Av. ii. p. 15 ; Bp.  
Consp. p. 211.

*Anabates ruficaudus*, Sclater, P. Z. S. 1856, p. 26, et 1858, pp.  
61, 456.

*Hab.* Ecuador ; Rio Napo ; Bogota.

## 3. XENOPS LITTORALIS, sp. nov,

*Xenops genibarbis*, Sclater, P. Z. S. 1860, p. 293.

*Similis Xenopi genibarbi ex Brasilia, sed statura majore, gula  
minus albescente, corpore subtus magis olivaceo et dilutiore  
distinguendus.*

Long. tota 4·7, alæ 2·5, caudæ 1·9, rostri a rictu 0·6.

*Hab.* In reip. Æquatorianæ regione littorali.

This *Xenops* is a climatic variety of *X. genibarbis* of Brazil, but has apparently as good claims to separation as *X. mexicanus*, its Mexican representative, or as *Xenops heterurus*, Cab. et Hein., from *X. rutilus*. It is a larger, stronger bird than *X. genibarbis*, and is lighter and more olivaceous in its coloration below. The wing-band which crosses the middle of the primaries and secondaries is broader and much deeper in colouring in the present bird, but the general coloration does not materially differ from that of the Brazilian form. My specimens were obtained by Mr. Fraser, at Esmeraldas, in November 1859.

## 4. SPHENOPSIS IGNOBILIS.

Sphenopsis, genus novum ex familia Dendrocolaptidarum, affine *Philydori* et ejusmodi formis plerumque *Anabatis* dictis. Rostrum brevius quam caput, æque altum ac latum, conicum, validum, gonyde recta : alæ modicæ, dimidium caudæ attingentes : pedes ut in genere *Philydore*, sed tarsi breviusculis.

Typ. et sp. unica *S. ignobilis*, sp. nov.

*Cinerascenti-olivacea, subtus paulo magis rufescens : superciliis a  
fronte obsolete rufescentibus, alis caudaque rufescente fulvo  
limbatis : rostro plumbeo : pedibus fuscis.*

Long. tota 5·0, alæ 2·8, caudæ 2·7, rostri a rictu 0·7, tarsi 0·75.

*Hab.* In Brasilia.

I have long had a single specimen of this little bird in my collection, under the manuscript name which I now bestow upon it, and have never seen a second. It is remarkable for the short, straight,

conical bill, in which it differs from all the allied species that I am acquainted with. The first, second, and third primaries increase gradually in length, the fourth and fifth being equal and longest. The tail is imperfect, but the lateral rectrices appear to have been shorter and graduated as in other allied forms.

#### Fam. FORMICARIIDÆ.

##### 5. THAMNISTES ÆQUATORIALIS.

*Similis* Th. *anabatino*, *sed supra olivaceus obscurior, et pileo rufescentiore, ferrugineo tincto, rostroque magis compresso diversus.*

Long. tota 5·5, alæ 2·9, caudæ 2·2.

*Hab.* In rep. Æquatoriana.

The genus *Thamnistes* appears to belong to the neighbourhood of *Thamnophilus* proper, with which it agrees in its thick, strong, compressed bill and general characters. I am also inclined to believe that the curious Brazilian form, *Biatas nigropectus* (Lafr.), agreeing as it does in general characters of structure and plumage, must be placed near it. Mr. Salvin received many examples of *Thamnistes anabatinus* in the collection made at Choctum in Guatemala in 1859–60, and believes that the birds with the large concealed interscapular spot are the males, and those without it the females of this singular form. If that is the case, which I think probable, my specimens of *Thamnistes æquatorialis* are both males, each of them possessing the interscapular spot. But neither of them are very perfect specimens,—one, obtained through M. Verreaux, and stated to be from the Rio Napo, being in moult, and the other, collected by Mr. Fraser at Nanegal, having been badly shot. I have, however, no doubt of their belonging to a second species of this curious form of *Thamnophilinæ*.

##### 6. RAMPHOCÆNUS SANCTÆ MARTHÆ.

*Similis* R. *rufiventris* ex Guatemala, *sed major, colore capitis multo minus rufescente, et ventre toto pallide fulvo, minus rufescente, dorso dilutius cinereo diversus.*

Long. tota 5·4, alæ 2·2, caudæ 2·0, rostri a rictu 1·1.

*Hab.* In rep. Nova Granada, regione boreali littorali.

The comparison of a specimen of the true Guatemalan *Ramphocænus rufiventris*, kindly presented to me by Mr. O. Salvin, with the present bird from Sta. Martha, has forced me to recognize them as different species, contrary to what I supposed when I wrote my "Synopsis of the American Ant-birds" in these 'Proceedings\*,' where the Santa-Martha bird is described under the name *R. rufiventris*. Though nearly allied, however, it is a larger and less decidedly coloured species, easily recognizable on comparison, and makes the fourth of the group.

\* See P. Z. S. 1858, p. 244.

## 7. GRALLARIA MEXICANA.

*Similis G. guatemalensi, sed major, colore corporis infra dilutiore, ventre albicantiore, et remigibus alarum extus rufescentioribus.*

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

This *Grallaria*, as Mr. Salvin has already observed (*Ibis*, 1861, p. 354), appears to be distinct from the Guatemalan bird, with which I have hitherto united it. It belongs to the typical series of the genus, at the head of which stands the *Grallaria rex* sive *varia* of Cayenne. I am now acquainted with five species belonging strictly to this section of the genus, namely—

1. *Grallaria varia*, Bodd. (*Turdus rex*, Gm.), ex Cayenna.
2. *G. imperator*, Lafr., ex Brasilia, mer.-orient.
3. *G. regulus*, Sclater, P. Z. S. 1860, p. 61, ex rep. Æquat.
4. *G. guatemalensis*, Prev., ex Guatemala.
5. *G. mexicana*, mihi, ex Mexic. merid.

As might have been expected, *G. guatemalensis* is intermediate in characters between *G. mexicana* and *G. regulus*. The dimensions of the three species are as follows:—

	<i>G. mexicana.</i>	<i>G. guatemalensis.</i>	<i>G. regulus.</i>
Long. tota.....	7·5	7·0	6·2
alæ.....	5·0	4·1	3·9
caudæ.....	2·0	1·8	1·2
tarsi.....	2·1	1·85	1·6

## Fam. TYRANNIDÆ.

## 8. COPURUS FUSCICAPILLUS, sp. nov.

*Niger : uropygio anguste albo : pileo ex cinerascete fusco, fronte et loris albicantibus : alis et cauda brunnescenti-nigris : caudæ reetricibus intermediis valde elongatis : rostro et pedibus nigris.*

Long. tota (cum cauda) 9·0, alæ 3·0, caudæ rect. med. 6·7, rect. later. 2·4.

*Hab.* In Nova Granada.

This is the commonest species of *Copurus* received in Bogota collections; but I have hitherto confounded it with *C. leuconotus* of Lafresnaye, and sometimes applied that name to it. The recent acquisition of examples of the true *C. leuconotus* from Guiana and Ecuador has now enabled me to separate the three species (or races) satisfactorily, as follows:—

## (1.) COPURUS COLONUS.

*Pileo albescenti-griseo : dorso nigerrimo : uropygio albo.*

*Muscicapa colonus*, Vieill. *Nouv. Dict.* xxi. p. 448, et *Enc. Méth.* p. 824 (ex Azara).

*Platyrrhynchus platurus*, Vieill. *Nouv. Dict.* xxvii. p. 17, et *Enc. Méth.* p. 839.

*Muscipeta leucocilla*, Hahn, *Ausl. Vög. Lief.* 9. pl. 2.

*Muscicapa filicauda*, Spix, Av. Bras. ii. p. 12. pl. 14.

*Muscipeta monacha*, Licht. Doubl. p. 53; Max. Beitr. iii. p. 925.

*Copurus filicauda*, Strickl. Ann. Nat. Hist. xiii. p. 427 (1844); Tsch. Faun. Per. p. 157; Burm. Syst. Ueb. ii. p. 507; Bp. Consp. p. 194; Sclater, P. Z. S. 1854, p. 113.

*Copurus colonus*, Cab. Mus. Hein. ii. p. 41.

*Hab.* In Brasilia mer.-or.

(2.) *COPURUS FUSCICAPILLUS*.

*Pileo fusco, fronte et loris albescentibus : dorso nigerrimo : uropygio albo.*

*Copurus leuconotus*, Sclater, P. Z. S. 1855, p. 148, et 1858, p. 71.

*Copurus fuscicapillus*, Verreaux, MS.

*Hab.* In Nov. Granada.

(3.) *COPURUS LEUCONOTUS*.

*Pileo fusco; fronte et loris albescentibus : dorso medio griseoscenti-albo : uropygio albo.*

*Copurus leuconotus*, Lafr. Rev. Zool. 1842, p. 335; Bp. Consp. p. 194; Sclater, P. Z. S. 1860, p. 294; Cab. et Hein. Mus. Hein. ii. p. 42.

*Copurus pæcilonotus*, Cab. in Schomb. Guian. iii. p. 703.

*Hab.* In Guiana, Nova Granada, et rep. Æquatoriana.

I am not acquainted with *Copurus funebris* of Cabanis and Heine (Mus. Hein. ii. p. 41), which may, perhaps, form a fourth species of the genus.

9. *PLATYRHYNCHUS FLAVIGULARIS*, sp. nov.

*Olivaceus, pileo brunnescenti-olivaceo ad frontem flavicantiore, crista mediali interne alba : alis caudaque fusco-nigricantibus, olivaceo anguste marginatis : subtus flavus, pectore, præcipue ad latera, olivaceo perfuso : rostro superiore nigro, inferiore cum pedibus pallide flavidis.*

Long. tota 3·0, alæ 2·3, caudæ 1·2.

*Hab.* In Nova Granada.

This *Platyrrhynchus* is allied to *P. rostratus*, in respect of its characteristic white head-spot, but is barely larger in size than *P. mystaceus*. It is, however, very distinct from both these species, being of a sulphur-yellow below, olivaceous on the sides of the breast. The specimen of this bird in my collection, which is the only one I have seen, was received from M. Verreaux, of Paris, and is a Bogota skin.

10. *PHYLLOMYIAS GRISEOCAPILLA* (Pl. XXXVI. fig. 2).

*Tyrannula griseocapilla*, Lafr. MS.

*Olivacea : pileo cinereo : alis fusciscenti-nigris, flavicanti-olivaceo limbatis : subtus gutture toto ad pectus albescenti-cinereo :*

*ventre medio et crisso albo, lateribus flavicantibus : rostro fusco, pedibus nigris.*

Long. tota 4·8, alæ 2·3, caudæ 2·0.

*Hab.* In Brasilia.

I have several specimens of this well-marked Brazilian species in my collection, but have never been able to find any other name than the late M. de Lafresnaye's MS. term, which I have ascertained to be correct from examination and comparison of the type in his collection.

This bird is closely allied to *Phyllomyias brevirostris* (Spix) (Cab. et Hein. Mus. Hein. ii. p. 57), but readily distinguishable by its dark cinereous head and white belly, &c.

#### 11. PHYLLOMYIAS SEMIFUSCA (Pl. XXXVI. fig. 1).

*Supra fusco-murina, superciliis obsolete albidis : tectricum alarum et secundariorum marginibus pallidioribus, fulvescenti-albidis : subtus lactescenti-albida, ventre stramineo vix tincto : rostro superiore nigricante, inferiore pallide fusco ; pedibus nigris.*

Long. tota 4·3, alæ 2·3, caudæ 1·9.

*Hab.* In Nova Granada, ad Sanctam Martham (*Verreaux*).

I have one example of this bird in my collection, procured by M. Verreaux's collector at Santa Martha, on the north coast of New Granada. Its structure is quite that of the preceding species and *P. brevirostris*, except that the bill is rather more elongated.

#### 12. TYRANNUS INCA.

*Tyrannus inca*, Licht. in Mus. Berol.

*Fuscescenti-cinereus, alis et cauda fuscis, marginibus dilutioribus : pileo cristato nigro, crista intus læte flava : subtus cinereus, ventre et crisso fuscescente adumbratis : rostro et pedibus nigris.*

Long. tota 7·5, alæ 4·0, caudæ 3·3, tarsi 0·6.

*Hab.* In Bolivia.

This is a very distinctly marked species of the true *Tyrannus*, of which I possess one example. I have used the name given to it by Lichtenstein in the Berlin Museum. The external primaries are acuminate towards the points, the three first being also deeply emarginated 0·4 inch from their extremities.

### 5. DESCRIPTIONS OF SOME NEW GENERA AND SPECIES OF SHELLS FROM THE COLLECTION OF HUGH CUMING, ESQ. BY HENRY ADAMS, F.L.S.

Genus CLEA, H. & A. Adams.

CLEA FUNESTA, H. Adams.

*C. testa ovata, solidiuscula, transversim striata, epidermide*

*nigro-olivacea induta; spira ovato-conica, apice decollato; anfractibus 4½, convexiusculis, ad suturam costis munitis, ultimo longiore, testæ dimidium paulo superante; apertura oblongo-ovata; labio polito, subcalloso; labro margine simplice, intus tenuiter incrassato.*

Long. 9; lat. 5 lin.

*Hab.* Malacca.

Shell ovate, rather solid, transversely striated, covered with a dark-olive epidermis; spire ovately conical, apex decollated; whorls 4½, slightly convex, furnished with an obsolete ridge at the sutures, the last rather more than half the length of the shell; aperture oblongo-ovate; inner lip smooth, somewhat callous; outer lip with the margin simple, slightly thickened within.

This species differs from the type, *C. nigricans*, in being smaller and less solid, and in having the spire shorter, with the sutural rib almost obsolete.

#### Genus. CANIDIA, H. Adams.

*Operculum parvum, unguiculatum, corneum; nucleo marginali, rostro basali elevato munito.*

*Testa fusiformis; spira longiore quam apertura, apice eroso; anfractibus convexiusculis, transversim plicatis; apertura elongato-ovata, antice valde emarginata; columella truncata, subrecta; labro simplici, antice sinuato.*

Operculum small, unguiculate, horny, the nucleus marginal and furnished with an elevated process behind.

Shell fusiform; spire longer than the aperture, apex eroded; whorls slightly convex, transversely plicate; aperture elongately ovate, with a distinct notch in front; columella truncate, nearly straight; outer lip simple, with a sinus at the fore part.

This genus is nearly allied to *Clea*, but differs from it in the columella being nearly straight, and in there being a sinus in the fore part of the outer lip. The distinct notch in front and the operculum distinguish it from *Hemisinus*, and the operculum from *Melanopsis*. The operculum is similar to that of a shell from Travancore lately described by Mr. Benson as a species of *Clea*. The operculum of the typical *Clea nigricans* I have not had an opportunity of observing. *Melanopsis helena*, from Java, is a second species of *Canidia*.

#### CANIDIA FUSCA, H. Adams.

*C. testa elongata, tenui, radiatim plicata, plicis sulcisque striatis, epidermide pallide fusca; spira elevata, apice eroso, sutura impressa; anfractibus 7, convexiusculis, prope suturam costis tenuibus, ultimo dimidium testæ vix æquante, et ad basin sulcato; apertura oblongo-ovata, intus alba; columella polita, subcallosa.*

Long. 10; lat. 4½ lin.

*Hab.* Camboja.

Shell elongate, thin, radiately plicate, the plicæ and the interstices striated, covered with a pale-brown epidermis; spire elevated, the apex eroded, the sutures distinct; whorls 7, rather convex, furnished with thin ribs at the sutures, the last less than half the length of the shell, and sulcated at the base; aperture oblongo-ovate, white within; columella smooth, rather callous.

Genus **CRYPTOPLAX**, Blainville.

Subgenus **NOTOPLAX**, H. Adams.

*Valvæ fere æquales, acuminatim cordatæ, disjunctæ, interstitiis mediocribus subæqualibus; area lateralis subconspicua.*

Valves of nearly equal size, acutely cordate, disunited, the intervals between them moderate and nearly equal; lateral area slightly indicated.

**CRYPTOPLAX (NOTOPLAX) SPECIOSA**, H. Adams.

*C. testa elongata; valvis acuminatim cordatis, olivaceis fusco maculatis, utraque lata, lævi, costa in dorso instructa, marginibus crasse granosis, area laterali elevata linea indicata. Limbus fuscus, spinulosus; poris mediocribus, spiculis conspicuis cinctis.*

Long. 36; lat. 12 lin.

*Hab.* Tasmania.

Shell elongate; valves acutely cordate, olivaceous with brown markings, each with a broad smooth dorsal ridge, the sides coarsely granular, the lateral area indicated by a raised line. Mantle brown, spinulose; the pores moderate, surrounded by conspicuous spicula.

This species is interesting from its possessing characters peculiar to both the genera *Cryptoplax* and *Acanthochætes*. The separation of the valves, however, induces me to place it in the former, but with the rank of a subgenus.

Genus **SEMELE**, Schumacher.

**SEMELE EXIGUA**, H. Adams.

*S. testa oblonga, transversa, inæquilaterali, nitida, tenui, alba, concentricè tenuissime striata; latere antico longiore, rotundato, postico breviorè, subangulato, ad marginem ventralem valde flexuoso; intus alba.*

Long.  $6\frac{1}{2}$ ; lat.  $5\frac{1}{2}$  lin.

*Hab.* Tasmania.

Shell oblong, transverse, inequilateral, shining, thin, white, finely striated concentrically; anterior side the longer, rounded; posterior side the shorter, subangulated, with a strong fold continued to the ventral margin; white within.

6. DESCRIPTIONS OF SIXTEEN NEW SPECIES OF LAND-SHELLS FROM THE COLLECTION OF H. CUMING, ESQ. BY DR. L. PFEIFFER.

(Plate XXXVII.)

1. *HELIX PHRYNE*, Pfr. (Pl. XXXVII. fig. 7.) *T. imperforata, depressa, tenuiuscula, epidermide tenui brevi setosa obducta, albida, fasciis fuscis et nigricantibus varie ornata; spira vix elevata, superne planata; anfr. 4½, convexiusculi, celeriter accrescentes, ultimus subinflatus, antice breviter deflexus, basi pallide fusca, late areolatus; apertura perobliqua, truncato-ovalis; perist. album, marginibus subconvixentibus, supero expanso et latere dextro late revoluto, basali reflexo, prope insertionem intus tuberculo minuto dentiformi instructo, loco umbilici in laminam affixam dilatato.*

Diam. maj. 26, min. 20, alt. 12 mill.

*Hab.* Ternate (Mr. Wallace).

Nearly allied to *H. exceptiuncula* of Férussac, and perhaps identical with the shell figured in Férussac's plate 73 A. fig. 1, under the name of *H. exceptiuncula*, var.

2. *HELIX LANCEOLATA*, Pfr. (1628 b). (Pl. XXXVII. fig. 6.) *T. umbilicata, subtrochiformis, acute carinata, solida, striata et minutissime granulata, superne cinereo-fuscescens; spira conoidea, vertice fusco, nitido, acutiusculo; sutura vix carinato-marginata; anfr. 5, convexiusculi, regulariter accrescentes, ultimus non descendens, basi planiuscula, saturate rufus; apertura diagonalis lanceolata; perist. expansum et ad carinam late revolutum, margine basali fusco, leviter arcuato, sublato reflexo, ad insertionem dilatato, umbilicum angustum fere occultante.*

Diam. maj. 27, min. 22½, alt. 14 mill.

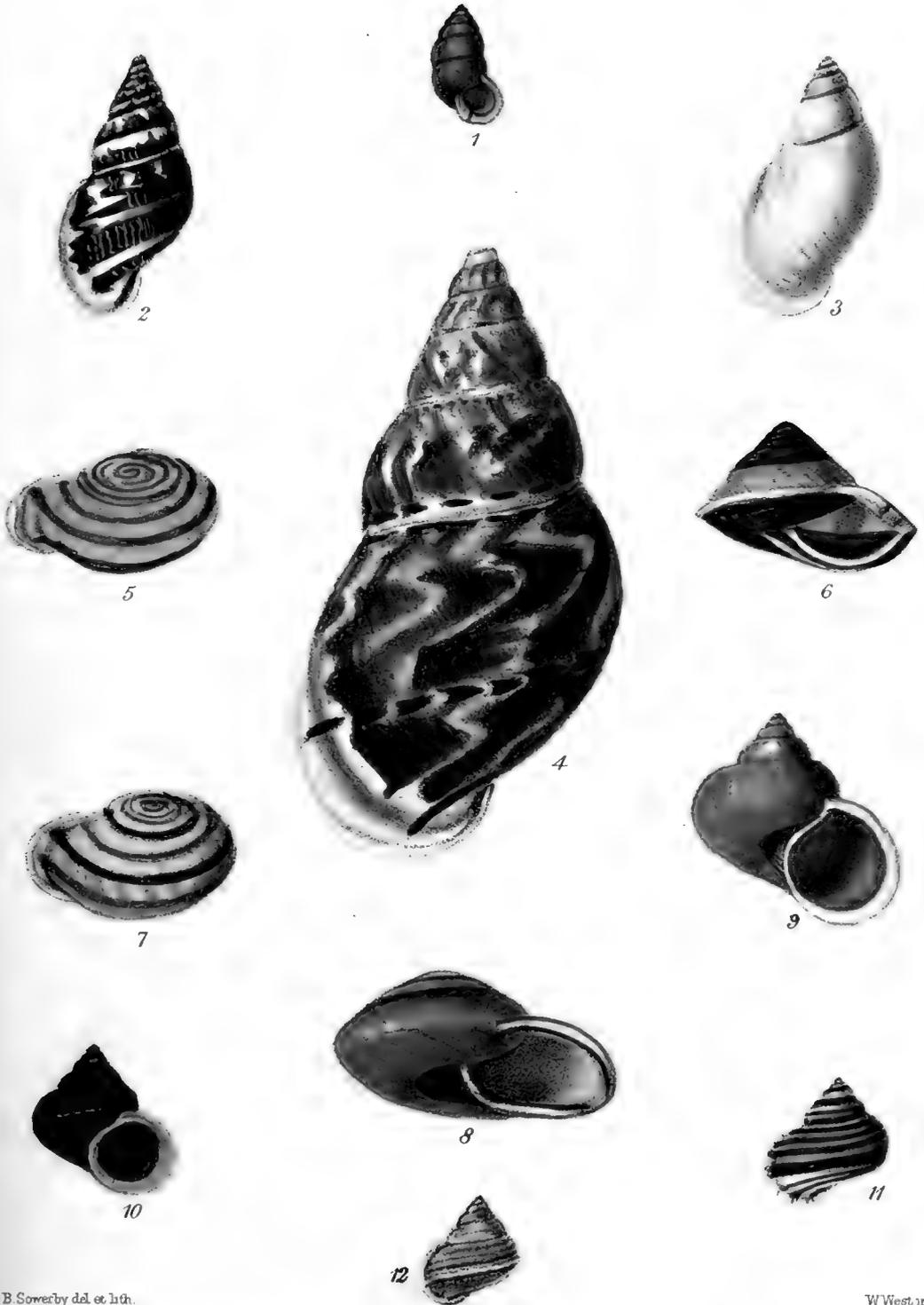
*Hab.* Ternate (Mr. Wallace).

3. *HELIX ATACTA*, Pfr. (1842 a). (Pl. XXXVII. fig. 5.) *T. umbilicata, perdepressa, tenuiuscula, oblique striata, fulvescenti-albida, fasciis 4 rufis ornata; spira vix elevata, vertice obtuso; sutura submarginata; anfr. 4½, convexiusculi, ultimus periphæria obsolete angulata, antice subgibbosus, pone aperturam subcristatus; apertura obliqua, elliptica; perist. album, late expansum et reflexum, marginibus approximatis, columellari intus vix incrassato, ad insertionem dilatato, umbilicum mediocrem conicum partim occultante.*

Diam. maj. 25½, min. 21, alt. 10 mill.

*Hab.* Ternate.

4. *HELIX CALYPSO*, Pfr. (1938 a). (Pl. XXXVII. fig. 8.) *T. umbilicata, depressa, solidula, conferte striatula, fulva, ad suturam rufo unifasciata; spira parum elevata, obtusa; anfr. 4, convexiusculi, regulariter accrescentes, ultimus non descendens,*



GB Sowerby del. et lith.

W West. imp.

1. *Pupinella borneensis*. 2. *Bulimus felix*. 3. *B. inclinatus*. 4. *B. gloriosus*.  
5. *Helix atacta*. 6. *H. lanceolata*. 7. *H. phryne*. 8. *H. calypso*. 9. *Cyclostomus isabella*. 10. *Leptopoma nigricans*. 11. *L. cinctellum*. 12. *L. menadense*.



*peripheria subcarinata, subtus nitidior, fulvo-lutescens, circa umbilicum infundibuliformem intus castaneum subangulatus; apertura perobliqua, irregulariter ovalis, intus albido-margaritacea; perist. pallide lilaceum, marginibus convergentibus, supero flexuoso, expanso et reflexiusculo, basali breviter reflexo, columellari fere verticaliter ascendente.*

Diam. maj. 36, min. 29, alt.  $14\frac{1}{2}$  mill.

*Hab.* Madagascar.

5. **BULIMUS GLORIOSUS**, Pfr. (118 a). (Pl. XXXVII. fig. 4.) *T. imperforata, conico-ovata, solida, oblique striata et lineis confertis spiralibus minute decussata, sub epidermide pallide virenti-fulva albido et spadiceo flammulata; spira conica; sutura submarginata; anfr.  $7\frac{1}{2}$ -8, convexiusculi, ultimus spira brevior, prope basin et infra medium nigro-castaneo cingulatus; columella alba, subcompressa, leviter torta; apertura parum obliqua, ampla, ovalis; perist. album, marginibus callo crassiusculo lacteo junctis, dextro expanso et reflexiusculo, columellari adnato.*

Long. 78, diam. 34 mill.

*Hab.* Republic of Ecuador.

6. **BULIMUS FELIX**, Pfr. (250 a). (Pl. XXXVII. fig. 2.) *T. compresse umbilicata, ovato-oblonga, tenuis, lavigata, albida vel carnea, strigis vel fasciis latis spadiceis albo punctulatis ornata; spira convexo-conica, vertice acuto nigricante; anfr. 6, convexiusculi, ultimus spiram subæquans, antice subascendens, basi attenuatus; columella subtorta, recedens, fusco-violacea; apertura subverticalis, ovalis, intus violaceo limbata; perist. simplex, album, marginibus callo castaneo junctis, dextro late expanso, columellari late reflexo, patente.*

Long. 33, diam. 13 mill.

*Hab.* New Granada.

7. **BULIMUS INCLINATUS**, Pfr. (272 a). (Pl. XXXVII. fig. 3.) *T. vix perforata, fusiformi-oblonga, solidula, striata et rugosa, striis spiralibus exiliter sculpta, nitidula, albida; spira conica, acutiuscula; anfr.  $5\frac{1}{2}$  convexiusculi, ultimus  $\frac{2}{3}$  longitudinis formans, ad basin attenuatus; columella callosa, substrictè recedens; apertura obliqua, ovalis; perist. simplex, margine dextro deorsum per dilatato, expanso, columellari subadnato.*

Long. 33, diam. 12 mill.

*Hab.* New Granada.

8. **ACHATINA BREVIS**, Pfr. (69 a). *T. conico-ovata, tenuis, pellucida, fulvo-cornea; spira conica, apice obtusulo; anfr. 6, modice convexi, striis a sutura descendentibus deorsum evanescentibus distinctè sculpti, ultimus spira paulo brevior, rotundatus; columella antrorsum torta, fere horizontaliter trun-*

*cata; apertura fere verticalis, sinuato-ovalis; perist. simplex, tenue.*

Long. 8-9, diam. 5-5 $\frac{1}{3}$  mill.

*Hab.* Ahmednuggur, India.

9. PUPA SERICINA, Pfr. (102 a). *T. subumbilicata, ovato-conica, subtilissime striatula, sericina, hyalina; spira sursum sensim attenuata, apice rotundato; anfr. 6, modice convexi, ultimus non ascendens, ad basin subcompressus; apertura subobliqua, oblonga, lamella intrante parietali marginem dextrum tungente coarctata; perist. callosum, album, rectangule patens.*

Long. 3 $\frac{1}{2}$ , diam. 2 mill.

*Hab.* — ?

10. CYCLOSTOMUS ISABELLA, Pfr. (41 a). (Pl. XXXVII. fig. 9.) *T. umbilicata, globoso-turbinata, solida, striis spiralibus inæqualiter distantibus cincta, nitidula, isabellina; spira brevis, acutiuscula; anfr. 5 $\frac{1}{2}$ , convexi, ultimus dilatatus, subtus sublævigatus, circa umbilicum angustum liris confertis sculptus; apertura parum obliqua, ovalis; perist. albidum, marginibus callo arcuatim exciso junctis, dextro late expanso et revoluto, sinistro angusto, vix reflexo. Operculum — ?*

Diam. maj. 26, min. 21, alt. 21 mill.

*Hab.* Madagascar.

11. CYCLOTUS NATALENSIS, Pfr. (§ 6. 37 a). *T. anguste umbilicata, turbinata, solidula, vix striatula, nitida, lutescenti-cornea, lineolis rufis minutissime variegata; spira turbinata, acutiuscula; anfr. 5, convexi, ultimus infra medium castaneo unifasciatus; apertura vix obliqua, subcircularis; perist. simplex, breviter adnatum, undique expansiusculum. Operc. normale.*

Diam. maj. 12, min. 10, alt. 9 $\frac{1}{2}$  mill.

*Hab.* Cape Natal.

12. LEPTOPOMA NIGRICANS, Pfr. (§ 2). (Pl. XXXVII. fig. 10.) *T. anguste umbilicata, globoso-conica, solidula, conferte striata, sericina, fusco-nigrescens; spira conica, acutiuscula; anfr. 6 $\frac{1}{2}$ , convexi, superiores obsolete spirally striati, ultimus infra medium subcarinatus, subtus planior; apertura obliqua, subangulato-rotundata; perist. album, duplex, internum vix porrectum, externum late patens, concentricè striatum, ad anfr. contiguum subinterruptum.*

Diam. maj. 18, min. 15, alt. 15 mill.

*Hab.* Menado, Indian Seas.

13. LEPTOPOMA CINCTELLUM, Pfr. (126). (Pl. XXXVII. fig. 11.) *T. anguste umbilicata, globoso-conica, tenuiuscula, spirally confertissime striata et liris 6 filiformibus (harum infima peripherica acutiuscula) cincta, albida castaneo plurifasciata, vel fulvida maculis obliquis fulvis minute variegata; spira turbi-*

*nata, acuta; sutura albida, subcrenata; anfr. 5, convexi, ultimus inflatus, subtus obsoletissime liratus; apertura obliqua, fere circularis; perist. simplex, album, sublata patens, marginibus callo tenuissime junctis, sinistro angusto.*

Diam. maj. 15-16, min. 13, alt. 12 mill.

*Hab.* Ternate.

14. *LEPTOPOMA MENADENSE*, Pfr. (29 a). (Pl. XXXVII. fig. 12.)

*T. perforata, globoso-conica, tenuiuscula, oblique striata, carinata, alabastrina; spira conica, acuta; anfr. 5, convexiusculi, ultimus peripheria acute et compresse carinata, superne turgidus et carinis 4 filiformibus (in anfractibus reliquis conspicuis) munitus, subtus sublævigatus; apertura fere diagonalis, subangulato-rotundata; perist. album, marginibus approximatis, dextro late patente, ad carinam angulifero, columellari angusto.*

Diam. maj. 12, min. 10, alt. 10 mill.

*Hab.* Menado, Indian Seas.

15. *PUPINELLA BORNEENSIS*, Pfr. (Pl. XXXVII. fig. 1.)

*T. perforata, ovato-oblonga, tenuiuscula, confertissime capillaceo-striata, sericina, corneo-fusca; spira ventrosa, vertice acutiusculo; anfr. 7, modice convexi, ultimus penultimo multo brevior, antice dilatatus, circa perforationem cristatus; columella sicut in P. pupiniformi; apertura subverticalis, circularis; perist. albidum, margine dextro expanso et reflexo, sursum producto, columellari late patente.*

Long. 13, diam.  $5\frac{3}{4}$  mill.

*Hab.* Borneo.

16. *PARTULA CALEDONICA*, Pfr. *T. profunde et compresse umbilicata, solidula, oblongo-conica, irregulariter striata, pallide carnea, strigis fuscis subconfertis irregulariter radiata; spira conica, acuta; anfr.  $5\frac{1}{2}$ , convexiusculi, medii distincte spiraliter striati, ultimus spira brevior, antice ascendens, medio impressus, ad basin saccatus; columella intus profunde subplicata; apertura parum obliqua, oblonga; perist. album, undique sublata expansum, marginibus convergentibus, dextro subflexuoso.*

Long. 22-22 $\frac{1}{2}$ , diam. 10 mill.

*Hab.* New Caledonia.

December 10th, 1861.

Professor Busk, F.R.S., in the Chair.

The Secretary exhibited skins of an Otter from Amoy, and of a Hare from the Island of Formosa, both forwarded to the Society by Robert Swinhoe, Esq., Corr. Memb.

Mr. Swinhoe, in a letter dated from the British Consulate, Amoy, June 29th, 1861, said:—

“I have succeeded in getting a fine specimen of the Chinese Otter at Amoy, which I have had skinned, and now send to your Society overland. I also enclose in same box a small Hare received from my collector in Formosa. This last appears to me to be only the *Lepus sinensis*, found abundantly from Foochow to Peking. The Otter is, I suppose, the Asiatic *L. nair* of Cuvier. It is here often found resorting to rocky shores, and prying in the salt water: it is by no means abundant, and difficult to procure. Indeed, notwithstanding all my vigilance, this specimen is the first adult that I have succeeded in procuring.

“I have an immature living specimen of *Mustela sibirica* that I intend sending to the Society. It is very tame, and, if properly cared for on the passage home, will perhaps reach you in safety. I fancy that the species is not in your Gardens, and will probably prove an acceptable acquisition.

“I am off to Formosa on the 1st July, and will there exert myself for the Society, if you will let me know what animals will be acceptable. Two species of Monkeys are found there, a small Muntjac (*Cervulus*), the new *Cervus taëvanus* of Blyth, and, it is said, another *Cervus* which I have not yet seen. Turtles of two species are abundant. You will hear from me again if I succeed in making any discoveries. I, of course, take with me my staff of bird-shooters and stuffers. My immense Amoy ornithological collections I intend leaving for the present at Amoy.”

The Secretary likewise stated that the box of skins shipped by Mr. Swinhoe on the “Harkaway,” and referred to by him in his letter read before the Society on the 9th of April last\*, had arrived in safety.

The Deer procured in the Imperial Parks of the Summer Palace at Peking, and supposed by Mr. Swinhoe to be referable to *Cervus wallichii*, was apparently not of that species. It had been submitted to the examination of Dr. Gray, who had already communicated the results of his investigations on this subject to the Society (see *anteà*, p. 236).

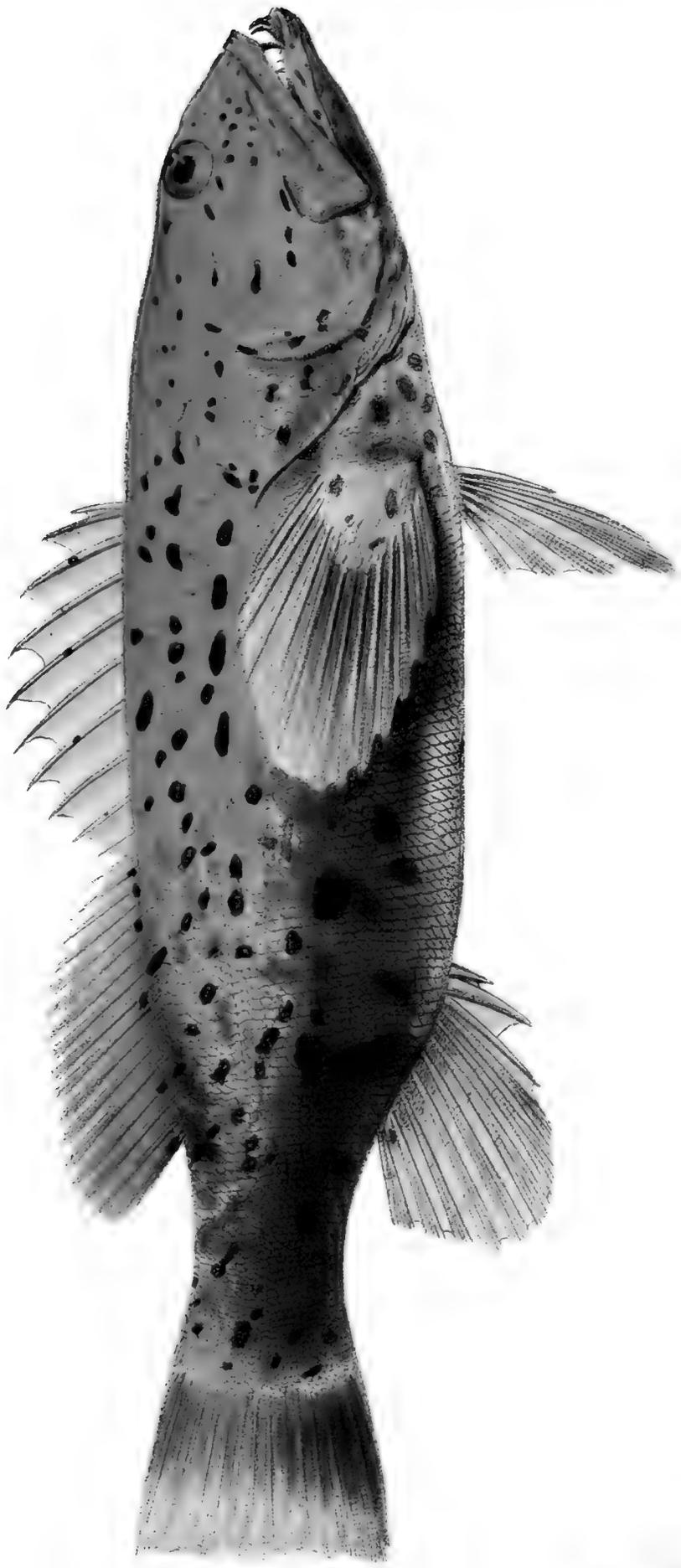
The Mole was considered by Dr. Gray to belong to a new species with a white tail, differing in the large size of its molars from *T. leucura* of India, and in the latter character agreeing with *Talpa micrura* of Hodgson, but having only two false molars on each side above. The Hedgehog was *Erinaceus collaris*.

The Snakes were of two species, concerning which Dr. Günther had kindly supplied the following note:—

“The *Tropidonotus* from Peking is a very remarkable variety of the European *Tropidonotus natrix*. It is at once distinguished by a black collar without yellow nuchal spots (as in the South European variety, *Trop. natrix*, var. *siculus*, Cuv.), and secondly by two anterior ocular shields—a character by which it approaches *Trop.*

\* See *anteà*, p. 134.





PLECTROPOMA RICHARDSONII.

*hydrus*, a species from Western Asia. Those who prefer to consider the Chinese *Tropidonotus* as a separate specific form may call it *Trop. orientalis*, with the following characters:—

“TROPIDONOTUS ORIENTALIS.

“Scales in 19 rows, strongly keeled; upper labials seven, the third and fourth entering the orbit; two anterior and three or four posterior oculars; anterior frontals not pointed, rather obtuse in front. Greenish olive, with three series of black spots anteriorly, becoming very indistinct on the middle of the trunk; a black subrescentic spot on each side of the neck, without yellow; posterior margins of the upper labials and a spot on the temple black. Belly more or less blackish. Three temporal shields, the anterior of which is the largest, in contact with two oculars. Ventral shields 152, anal bifid; subcaudals 64.

“*Hab.* N. China (*Swinhoe*).

“The second species of Snakes from Pekin is *Elaphis dione*, and the specimens do not show any difference from an individual from the Caucasus.”

Dr. Günther exhibited some Charrs from different localities in England, Wales, and Ireland. He considered the Irish species undescribed, and proposed to call it *Salmo grayii*; but promised further particulars at a subsequent meeting.

Mr. Bartlett exhibited a specimen of a young Polar Bear born in the Society's Menagerie, and made some remarks in confirmation of his observations as contained in a communication to the Society on a previous occasion (see P. Z. S. 1860, p. 130).

The Rev. H. B. Tristram exhibited a Snake from Pekin (referred by Dr. Günther to *Bungarus fasciatus*) and a series of Pipits, which seemed to lead him to the conclusion that the *Anthus spinoletta* of the Continent (if a good species) occurred also in England.

The following papers were read:—

1. ON A NEW SPECIES OF PLECTROPOMA FROM AUSTRALIA.

BY DR. ALBERT GÜNTHER.

(Plate XXXVIII.)

PLECTROPOMA RICHARDSONII.

D.  $\frac{10}{18}$ . A.  $\frac{3}{8}$ . L. lat. 105.

The height of the body is contained four times and a half in the total length, the length of the head three times and a quarter. Inter-orbital space concave, half as wide as the orbit. Snout conical, with the lower jaw produced. Cleft of the mouth wide, the maxillary extending behind the orbit. Dentition very strong; the upper jaw with a patch of cardiform teeth in front, and a narrow villiform band

on the side; there is a very long curved canine tooth on the outer side of the cardiform teeth, followed by a series of five or six teeth of moderate size. Lower jaw with a pair of very strong canines anteriorly, and with four or five strong, canine-like teeth on the side. The upper canines are received in a notch behind those of the lower jaw. Vomerine and palatine teeth in a narrow band, the former angularly bent.

Lower jaw more than half as long as the head. Præopercular margin rounded, finely serrated posteriorly, and with a small spine on the middle of its inferior margin, pointing forwards. Pectoral rounded, scaly at the base, as long as the mandible; ventral not quite half as long as the head. The spinous dorsal is separated from the soft by a very deep notch: the spines are rather slender; the fifth and sixth are the longest, one fourth of the length of the head. The soft portion higher than the spinous, with the upper margin nearly even; base scaly. The second anal spine as long as, but stronger than, the third. Caudal truncated.

Upper part of the head, cheeks, back of the trunk, and the spinous dorsal bright red; the remainder of the fish yellow, with a very broad, irregular, brown band from the axil to the lower half of the caudal. Head and upper parts of the body with scattered irregular small blue spots, most of which are edged with brown; the brown band with large dark-brown spots. Fins immaculate, except the spinous dorsal, which has a few small blue spots.

Freemantle (Australia).

Length  $15\frac{1}{2}$  inches.

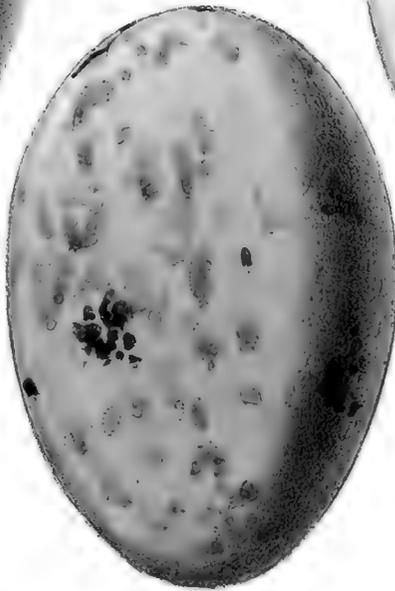
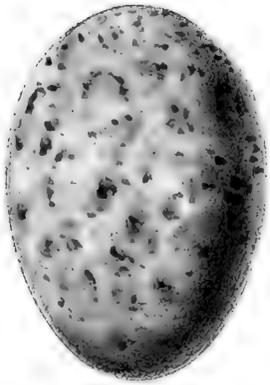
The nearest ally of this species is *Plectropoma dentex*, Cuv. & Val.; but the coloration, as represented in the 'Voyage de l'Astrolabe' (Poisson. pl. 4. fig. 2), is so entirely different that we cannot refer our specimen to that species. *Pl. dentex* has been figured for the second time in the 'Voyage of the Erebus and Terror,' pl. 57, from a stuffed specimen in the British Museum. This specimen agrees well with *Pl. richardsonii* in general form, but its original colours have nearly entirely gone; large round light blotches are still visible on the side of the body, but there is no trace left of the white spots on the back. Whether this specimen belongs to *Pl. dentex* or to *Pl. richardsonii* is impossible to say; probably it is referable to the former.

## 2. ON A HYBRID DUCK. BY ALFRED NEWTON, M.A., F.L.S., F.Z.S.

I am indebted to the kindness of my friend Mr. Newcome for the opportunity of exhibiting to the Society a specimen of a fine hybrid Duck, beautifully mounted by Mr. Ellis of Swaffham, which presents several points of interest.

This bird (a male) was bred by Mr. Durham of Bremley Grange, near Ripon, from a male Widgeon (*Mareca penelope*, Selby) and a female which was a cross between the common Wild Duck (*Anas*





*boschas*, Linn.) and an ordinary farm-yard Duck. It was sent to Mr. Newcome by the intelligent gamekeeper at Hornby Castle, Mr. Anthony Savage, from whom I learn that Mr. Durham has since bred several other hybrids from the same male Widgeon and a female of the domesticated variety of *Anas boschas* known as the "Grey Call-duck." Of these hybrids Mr. Savage informs me that he sent a pair to Mr. Grantley Berkeley, and another pair to Mr. John Hancock.

No detailed notice of the particular cross I now exhibit has to my knowledge been hitherto published, though Mr. Yarrell in the last edition of his work ('B. B.' ed. 3, iii. p. 276) mentions the fact as having occurred, and my friend M. de Selys-Longchamps, who has, it is well known, devoted especial attention to the subject, informed me about two years ago that he was aware of other instances of such a hybrid. According to the views of the last-named accurate observer, the *Anas bimaculata* of Keyserling and Blasius\*—the *Anas glocitans* of Gmelin (but not of Pallas)—is the result of this cross; and Mr. Berkeley has also expressed a similar opinion ('Field,' March 16, 1861). With the greatest deference to these authorities, my own idea is that the birds so denominated have descended from the Wild Duck (*Anas boschas*, Linn.) and the Teal (*Querquedula crecca*, Steph.), as has already been suggested by Mr. Tomes and Mr. Bartlett ('Zoologist,' p. 1698); and I have arrived at this conclusion not only from repeated examinations of the specimens described by Mr. Vigors (Linn. Trans. xiv. p. 559), which are now in the British Museum, but also from having seen several other birds of the same kind in different collections.

The principal distinctions observable between the subject of the present notice and the so-called *Anas bimaculata* are in the greater size of the former, and in the comparative obsolescence of the dark patch which, in that supposed species, separates the lighter-coloured spots on the sides of the head. In the bird I now submit to your notice this patch is reduced to a mere line, scarcely perceptible until looked for. The breast also wants the well-defined dark spots which are characteristic of the hybrid known as the "Bimaculated Duck."

### 3. ON SOME NEW OR RARE BIRDS' EGGS. BY ALFRED NEWTON, M.A., F.L.S., F.Z.S.

(Plate XXXIX.)

Without in any way wishing to exact for oology a greater degree of attention than most naturalists think it deserves, I entertain a very strong conviction that its study will eventually be found highly useful to the systematic ornithologist. I am, however, quite content

\* Several writers assign the authority of Pennant for the trivial name "*bimaculata*." I cannot trace it further back than the 'Wirbelthiere Europa's' of the naturalists I have mentioned. There is no question about the *Anas glocitans* of Pallas being a good species, but I do not know any recorded instance of its occurrence in Europe.

to let the future decide the matter, and am even prepared to be considered, with my brother egg-collectors, for the present as nothing more than one of a number of harmless enthusiasts. But scientific naturalists, for whom I yield to none in respect, must remember that, as M. Des Murs in his late able work has well remarked, our special branch of study is quite in its infancy. We scarcely know the oological characters of a tithe of the 7000 or 8000 species of birds which are supposed to exist; and of these our knowledge extends to little more than two of the six physical regions of the earth. Besides, it is only recently that our inquiries have been pursued with that attention to facts which the nature of the subject pre-eminently requires. It is not, therefore, to be wondered at if many of the conclusions which, notwithstanding our very limited acquaintance with the study, some of us have attempted to form, are found on further research to be ill-founded. But there is, I hope, no need for me to protract these apologetic remarks; I have only to add that, in exhibiting to the Society a few rare or new eggs which it has been my good fortune, chiefly through the kindness of several friends, recently to procure, I am not actuated by any ostentatious motive, but rather by a reliance on the truth of the old adage that "seeing is believing." Knowing, as I do, that the most scrupulous exactness in recording the dimensions and in describing the colours of eggs fails to give any accurate notion of the originals, I shall rather dwell, in what I have to say, on the history of the different specimens than on their appearance, mentioning also briefly what is known by me of the nesting of the species to which they belong.

#### SNOWY OWL.

*Nyctea nivea*, Bonaparte.

I must confess to having done my friends Mr. Hewitson and Mr. Wilmot the injustice of believing that they had, without due cause, ascribed an egg possessed by the last named gentleman to this species. Still so little has been published in England respecting the Snowy Owl's manner of nidification, that I hold myself excused for here presenting to the Society what information I have been able to collect on the subject, in illustration of the specimens I exhibit.

Towards the latter half of the last century Mr. Hutchins, in his manuscript observations on the habits of birds in the Hudson's Bay territory, says of his "Spotted Owl" or "Wapacuthu," that it "makes a nest in the moss on the dry ground," and "lays from five to ten eggs in May." Sir John Richardson, from whom I quote this statement, seems uncertain as to the species to which Hutchins's remarks refer ('Fauna Bor.-Amer.' ii. p. 86, *note*), but I think there cannot be much doubt that it was the Snowy Owl. Sir John further states (*op. cit.* p. 89), as the result of his own inquiries, that this bird "makes its nest on the ground, and lays three or four white eggs." So also Mr. Hearne confirms the truth of Hutchins's observation ('Journey,' p. 402)—a statement which Mr. Cassin ('B. Calif.' p. 194) is inclined to doubt.

According to Herr Wallengren ('Naumannia,' 1854, p. 78), Professor Lilljeborg on June 3rd, 1843, found on the Dovrefjeld a nest of this bird, containing seven eggs, placed on a little shelf on the top of a bare mountain, far from the forest, and easy of access. Professor Nilsson mentions ('Skand. Faun.' ed. 3, II. i. p. 101, *note*), on the authority of my friend Herr A. G. Nordvi, that the Lapps in East Finmark assert that the Snowy Owl lays from eight to ten eggs in a little depression of the bare ground on the high mountains. These accounts are in every way corroborated by the information obtained by Mr. John Wolley, during his long sojourn in Lapland. He several times met with persons who had found nests of this Owl, and states ('Forhandl. Skand. Naturf.' 7de Møde, p. 221) that he was told the old birds sometimes attack persons that approach their nests. He was, however, unsuccessful in obtaining their eggs. They seem to breed commonly in the districts explored by him only when the Lemmings are unusually abundant. From his chief agent, who is now in my own employment, I learn that from the 16th to the 24th of May is supposed to be the time when they usually breed, and that in 1860 a Lapp, who was not, unfortunately, one of his regular collectors, found a nest with six eggs, which, instead of preserving, he ate.

Many specimens, said to be the eggs of this bird, have of late been received by European oologists, all of which so closely agree with one another, and differ so much from those of other Owls, that I believe they have been rightly assigned. Some are stated—with what truth I know not—to have come from Count Hoffmans egg, who a few years ago was collecting around Archangel. The majority, however, are from the Moravian missionaries in Labrador. One of these, which I now exhibit, I obtained this last autumn at Herrnhut from Herr Möscher. He received it with several others in 1860 from Okkak, one of the four stations maintained on that coast by the United Brethren. He has had in all more than two dozen from that quarter. The Esquimaux find them and bring them to the missionaries; and the accounts they give tally exactly with those I have just quoted from other sources. The bird always breeds on the ground in bare places, and often lays a considerable number of eggs. The second egg I exhibit is also from Herr Möscher, but received by me through the intervention of Dr. Baldamus. It is stated to have come from North-eastern Russia; but more concerning it I do not know.

Mr. Hewitson has twice figured ('Eggs B. B.' ed. 2, pl. 12\*, and ed. 3, pl. 18. f. 3) the specimen to which I have before alluded, from the collection of Mr. Wilmot, who has kindly informed me he received it with another from a missionary station in Labrador, whence in the preceding year two young birds, taken from the same nest, had been brought by the same person.

#### GOLD-VENTED THRUSH.

*Pycnonotus aurigaster* (Vieill.).

As far as I know, this is the only egg received in England which

with any amount of probability can be assigned to this species. It was sent to me about a year ago by Mr. Edgar Layard of the South African Museum, Cape Town, who tells me that, to the best of his belief, it is rightly assigned. However, he did not take it himself, though he says that the finder knows the birds of the colony tolerably well. It certainly appears to be the egg of an Ixodine or Pycnonotine bird; but I believe there are found at the Cape of Good Hope, besides *Pycnonotus aurigaster*, three other allied species, namely, *P. capensis*, *Andropadus importunus*, and *Phyllostrephus capensis*, the former of which, at least, would seem to breed in the country (Victorin, Kongl. Vet. Akad. Handl. Bd. ii. no. 10. p. 34).

I can hardly allude to this species without expressing my entire dissent from the opinion of those naturalists who, on the strength of the occurrence of an example of it in the county Waterford, would recognize it as a "British bird." I do not, however, question the fact of the occurrence as reported; nor do I doubt that the species was rightly determined, though for myself I have not seen the specimen.

#### NUTCRACKER.

*Nucifraga caryocatactes*, Leach.

A genuine specimen of this bird's egg—that is, one which has been properly identified and authenticated—has for some time been the *desideratissimum* of my collection. Of the examples I now exhibit, that which I am most inclined to believe in is one sent to England in 1860 by Mr. H. W. Wheelwright, who writing from Gardsjö in Wermeland, under the signature of "An Old Bushman" ('Field,' No. 409, Oct. 27th, 1860), says, "The nest of the Nutcracker I never took myself; but it breeds in Sweden, and this year I received two sets of eggs not far from here from a correspondent upon whom I can rely. In both cases the eggs were four; and, though I saw neither nest [*in situ*?], it was described as being in a small fir, and not unlike the nest of a Jay." Four of the eggs, the contents of one nest, are now in the collection of Mr. John Hancock, where I have seen them, and in general appearance they closely resemble the example now shown. Of the remaining three, from the other nest, one was unfortunately broken, while the other two, which, I am informed, agree with the present in colouring, are also in the possession of English collectors. It will be seen, from the specimen which is the subject of these remarks, that they were in no way like eggs of the Jay (*Garulus glandarius*, Leach). Indeed, they have more the appearance of being dwarfed eggs of the Magpie (*Pica caudata*, Flem.); but the description of the nests furnished to Mr. Wheelwright precludes us from so considering them; and the fact of the entire contents of two nests being so exactly similar renders it somewhat improbable that they should be abnormal varieties laid by that or any other bird.

Of the remaining examples now exhibited, two were sent me by Dr. Eduard Baldamus. One of these was received by him from the South Carpathian Mountains, through Herr Bielz. In colour, as Dr. Baldamus has stated ('Naumannia,' I. i. p. 71), it is not unlike a

palely-marked Jackdaw's egg (*Corvus monedula*, Linn.), but the nest is said to have somewhat resembled a Jay's. The other was obtained by Dr. Baldamus from Savoy, through the Abbé Caire. It is rather larger than the preceding, and has the ground-colour of a paler blue-green, and is not very much unlike the egg of the Alpine Chough (*Pyrrhocorax alpinus*, Vieill.). Herr F. W. Bädeler has described and figured a second specimen procured in the same quarter ('Journ. f. Orn.' 1856, p. 32, pl. 1. f. 1), which more resembles my Transylvanian one. Baron Richard König-Warthausen, in an able paper lately published ('Journ. f. Orn.' 1861, pp. 33-44), has expressed his opinion that the eggs obtained by Dr. Baldamus from Herr Bielz are Jays', and that those procured from M. Caire only are entitled to the consideration of naturalists as Nutcrackers'. The eggs which my friend Mr. Tristram has described ('Ibis,' 1860, pp. 169, 170) I am compelled, much against my will, to doubt. One of them, which I have seen and compared with my series of the eggs of the Siberian Jay (*Perisoreus infaustus*, Bp.), is not to be distinguished by any character I can detect.

The remaining two eggs I now exhibit, though sent to me as those of the Nutcracker, are without doubt abnormal Jackdaws'.

Under these circumstances I forbear from having any of my specimens figured, in the hope that before long I shall have the pleasure of giving some more certain information on the subject.

#### PALLAS'S SAND-GROUSE.

*Syrhaptus paradoxus* (Pallas). Pl. XXXIX. fig. 1.

No egg of this species, I believe, has ever before been seen in England, though I understand that Herr Radde has obtained specimens in Eastern Siberia, which are now in St. Petersburg. The present example was laid in the Society's Gardens, June 21st, 1861, by one of the birds brought from China. I saw it a very few hours after it had been produced. Its colour was then very brilliant, the brown spots showing warmly against the fresh sea-green ground. It was placed in the incubator; but a few days afterwards Mr. Bartlett found it to be cracked, and it was purchased by me from the Society. I should add that there were no birds of any other species in the cage where this egg was laid.

#### MACQUEEN'S BUSTARD.

*Houbara macqueeni*, Bonaparte. Pl. XXXIX. fig. 5.

Without being able to express an opinion of my own on the question whether the Houbaras of Africa and Asia are to be considered specifically distinct, I am content to include in this list of oological novelties an egg of the eastern race, which was sent to me by Mr. Christian Rassam, Her Majesty's Consul at Mosul, with the information that it was taken by an Arab at Tel-Yacoob, May 21st, 1860. Mr. Blyth, I believe, is unequivocally of opinion that the Houbaras of the Mesopotamian plains are identical with those of Scinde and Affghanistan; I therefore think that I am justified in figuring the pre-

sent specimen as a genuine one of MacQueen's Bustard, though both the Great and Little Bustards (*Otis tarda*, Linn., and *Tetrax campestris*, Leach) also occur in Assyria. The present egg does not differ much from that of the western form (*Houbara undulata*, Bp.); but, as far as I know, it is the only one that has yet reached any European collector.

#### GREY PLOVER.

*Squatarola helvetica*, Brehm. Pl. XXXIX. fig. 2.

The egg of this cosmopolitan species has been confessedly one of the rarest and most sought for by collectors. It is now well known that Sir John Richardson must have been mistaken in his assertion ('F. B.-A.' ii. p. 370) that the Grey Plover breeds in Pennsylvania.

The specimen which I now have the pleasure of exhibiting was sent me a few months ago by my friend Dr. Baldamus, who received it from Councillor von Middendorff. This intrepid traveller states ('Sib. Reise,' II. ii. p. 290) that the bird breeds on the Byrrangá Mountains, in latitude 74° N., as well as on the Boganída, in latitude 71° N., and that it is much less common there than *Charadrius pluvialis*. He found a nest on June 26th, with four eggs, which he describes with some minuteness, besides figuring an example (t. 19. f. 1). They greatly resemble in character those of the Lapwing (*Vanellus cristatus*) and Dotterel (*Eudromias morinellus*), but are much larger. My specimen is, I believe, a good deal under the average size, and yet it is more bulky than any Golden Plover's that I have, thereby confirming Von Middendorff's remark. With it Dr. Baldamus sent me a memorandum, bearing the autograph of the discoverer, as follows:—

"*Squatarola helvetica*,  $\frac{1}{vii}$  '43, fluv. Taimyr, 74°.—Middff."

#### LITTLE STINT.

*Actodromas minuta*, Kaup.

For the knowledge of the egg of this species oologists are indebted to the researches of Von Middendorff, and I for its possession to the kindness of Dr. Baldamus, who received the specimen I am now able to show from that distinguished Siberian explorer. He states ('Sib. Reise,' II. ii. p. 221) that he found the bird breeding on the river Taimyr, in latitude 74° N.; but apparently only obtained a single nest of four eggs, one of which is before you, taken, it would seem, July 1st—the same day as the Grey Plover's egg I have just mentioned. As might be expected, the specimen agrees very much with those of the kindred *Limonites temmincki*, which he states breeds in the same locality, but is a much rarer bird there.

#### GREAT WHITE HERON.

*Egretta alba*, Bonaparte. Pl. XXXIX. fig. 6.

In a former edition of his well-known work, Mr. Hewitson figured

(‘Eggs B. B.’ 2nd ed. pl. 75. f. 1) a supposed egg of this species, but most wisely, as I think, omitted it from his latest volume. Whether the original of his drawing was that of the large American Egret (*E. leuce*, Bp.) or of the Indian allied species *E. nigrirostris*, Gray) I cannot say; but I feel very sure it was not that of the European bird. I believe the present specimen to be in all respects the most satisfactory of any that I have the pleasure to bring before the Society this evening. It was given to me by my excellent friend Dr. Baldamus, having been taken by himself in Hungary some fourteen years ago; and he assures me that during that time it never left his possession until it passed into mine.

The late Baron von Löbenstein seems to have been the first discoverer of the nidification of this beautiful Heron, in 1840; and in 1847 Dr. Baldamus found another breeding-place, like the former, in Hungary. From the accounts published (‘Naumannia,’ 1851, iii. p. 18, and iv. p. 41), the nests on both occasions were placed in beds of gigantic reeds, and were very difficult of access. A large colony of Purple Herons (*Ardea purpurea*, Linn.) were also breeding in company; but the great difference in the size of the eggs of the two species renders it almost impossible that any mistake should have been made by the captors. Dr. Baldamus only obtained a dozen specimens of *Egretta alba*, of which I think he has but a single one remaining in his cabinet, so great has been his liberality towards his fellow-collectors. The egg I now show is much larger than that of any other European species of Heron,—so much so, that some of my friends have suggested, in ignorance of the circumstances of the case, that it may have been a double-yelked monstrosity. But I think this objection will vanish when the length of the legs in the Great White Heron is taken into consideration\*, coupled with the memorandum of Dr. Baldamus, from which I translate the following:—

“The eggs of *Ardea alba* were found on the 23rd June, 1847, in a great marsh on the ‘White Morass,’ adjoining the Ecska, near Nagy-Becskerek, in the Royal Banat (South Hungary). In all there were twelve specimens, the whole ready to hatch. The young had white down. The very large nests stand on the luxuriant stems of a forest of reeds, which are about 12 feet high, and some hundred yards from the margin. Altogether there were eleven or twelve pairs breeding, and pretty near to one another. Most of the nests contained small young, clothed in white down.”

\* The best and most detailed description of this bird with which I am acquainted is that of MacGillivray (‘Hist. B. B.’ iv. pp. 460 *et seq.*), though he is certainly wrong in considering his British specimen, which he there calls *Egretta nigrirostris*, as distinct from the Continental *E. alba*. He gives (p. 469) the following dimensions:—Bare part of tibia 5 inches 6 lines, tarsus 7 inches 9 lines, third toe 4 inches 6 lines; while in the Common Heron (*Ardea cinerea*, Linn.) the same parts measure respectively 2 inches 6 lines, 6 inches 1 line, 3 inches 6 lines (p. 443). In a former work this laborious ornithologist had denominated the same specimen *Erodus victoriae* (‘Man. B. Orn.’ ii. p. 131).

## STELLER'S DUCK.

*Somateria stelleri* (Pall.). Pl. XXXIX. fig. 4.

To the same kind friend, Dr. Baldamus, I owe the opportunity of exhibiting the egg of this bird, which is one that he received from Von Middendorff, who states ('Sib. Reise,' II. ii. pp. 234, 235) that he discovered it breeding pretty commonly on the flat "tundras" of the Taimyr. On the 25th June the nests found contained from seven to nine newly-laid eggs, of which he gives in his work representations of three specimens (tab. 23. figs. 3-5).

I may perhaps be allowed to add that, towards the end of June and in July 1855, when in East Finmark in company with Mr. W. H. Simpson and the late Mr. John Wolley, we saw several small flocks of this species at various places along the Waranger Fjord, but we could never detect an old male in the breeding-plumage; and I imagine that it is seldom that one is to be found there in summer, though in winter and spring adults certainly occur, as we not only learned from the inhabitants, but as may be seen from the account given by Herr Schrader ('Journ. f. Orn.' 1853, pp. 320, 321). Mr. Wolley succeeded in shooting three birds, which I myself dissected; and the figures of the *trachea* of this species, given by Mr. Yarrell in the last edition of his work ('B. B.' 3rd ed. iii. p. 309) are taken from the specimens I then prepared; but unfortunately, the engraver having omitted to reverse the drawings placed in his hands, the representations are in this particular inaccurate. These examples were apparently all young ones of the preceding year; but as the *trachea* of the Eider (*Somateria mollissima*, Boie), when immature, does not differ from that of the adult, I think we may safely infer that these present the same appearance that they would have done had the subjects been older. Though we made unceasing inquiries, we could not ascertain that Steller's Duck breeds in any part of Norway or in the adjoining districts of Russia. In its habits it seems to resemble the common Eider, as much as it does in general appearance; and those I saw were only to be distinguished, at a distance, from the females or young males of that species by their smaller size. They were generally found swimming near the shore, or sitting at low water on the sea-weed-covered rocks, or flying near the surface from point to point. On one occasion, just as we had crossed a small but rapid river a few hundred yards from its mouth, a large flock came flying down over the water. They passed quite close to us, but our guns were not at hand. I presume they had been feeding higher up the stream; but at no other time did I ever see them at any distance from the shore.

## IVORY GULL.

*Pagophila eburnea*, Kaup.

I obtained this egg also from Dr. Baldamus, who procured it from the late Apothecary Mechlenburg of Flensburg, with the information that it was brought to him from Spitzbergen. In that distant island, I believe, no other species exists which is likely to lay an egg

like the present specimen. For this reason, therefore, I am chiefly inclined to trust in it. At the same time I am bound to say that, until a few days ago, I never heard of but one instance of the Ivory Gull's nest having been found in Spitzbergen. In 1854 a veteran walrus-hunter told Mr. Wolley that he believed it bred in the north-east of the country, and even indicated the spot by name—Porrovara (*i. e.* Reindeer Hill). But in most years the ice keeps vessels off that part of the coast until August, when, of course, it is too late for eggs. From another source I learn that the naturalist of the Swedish Arctic Expedition which last summer was examining the Spitzbergen seas is said to have obtained in July some eggs of the Ivory Gull, hard sat-on. I hope, therefore, shortly to be able to bring before the Society a better-authenticated specimen.

#### FORKED-TAILED GULL.

*Xema sabini*, Leach.

The ruins of an egg of this rare Gull were sent me by Dr. Baldamus. He obtained it from Von Middendorff, who found the species on the lakes of the *tundras* and the little islets at the mouth of the Taimyr, breeding abundantly in company with the Arctic Tern (*Sterna macrura*, Naum.), as Gen. Sabine had done twenty years previously on the islands in Melville Bay. He gives also a figure of an egg ('Sib. Reise,' II. ii. p. 244, t. 25. f. 1). Whether any specimens were brought home by the first discoverer of this species I do not know; if so, it is probable they are no longer in existence, though it is clear, from the accounts given ('Linn. Trans.' xii. p. 520), that many might have been procured. I am not aware that any of the later Arctic voyagers obtained others; nor has greater success attended the Greenland correspondents of the Danish naturalists.

#### POMERINE SKUA.

*Lestris pomerinus*, Temminck. Pl. XXXIX. fig. 3.

I am again indebted to Dr. Baldamus for one of the specimens of this egg that I now exhibit. It was sent to him by Von Middendorff, who states ('Sib. Reise,' II. ii. p. 240) that the bird breeds in especial abundance on the *tundras* adjoining the river Taimyr. He found the first eggs on the 7th July in latitude 74° N., two lying on the moor without any nest; and in his work (t. 24. f. 1) he gives a representation of a specimen. Other examples in my collection I have obtained from Pastor Theobald and Conservator Conradsen of Copenhagen, whither they were sent from the Danish settlement in Greenland; but these are not so fully identified as my Siberian specimen, which forms the subject of the accompanying illustration.

In June 1855, Mr. Simpson and myself observed off Berlevaag, a promontory east of the North Cape, large flocks of this species. On our return a few weeks afterwards with Mr. Wolley, we again saw them. In 1857, that gentleman sought diligently, but unsuccessfully, for their breeding-place in this district. He was led

believe that in the years when the Lemmings swarm in the mountains, they usually breed far in the interior of the country; for this, as well as the allied species of *Lestris*, preys much on these little rodents. It is perhaps worthy of remark that, in the full-plumaged Pomarine Skua, the middle tail-feathers have a kind of twist in their shafts, which brings the lower surfaces to meet together towards their extremities in a vertical direction; and this peculiarity gives the bird, when on the wing, a very singular appearance, as we had several opportunities of observing.

Having profited so largely by the generosity of Dr. Baldamus, it is only fitting that I should close these remarks by saying that in August last I had the pleasure of looking over his egg-cabinet, which, in the number of European species it contains, is the richest I have ever seen. He has not, it is true, a very large series of any one sort; but he has now been collecting for many years with unremitting care, especially with regard to the genuineness of the specimens he has obtained. Hence not only are the results very valuable, but, in critically inspecting the contents of his cabinet, one has no cause for exercising that restraint on one's remarks which is unfortunately so often the case when viewing collections interspersed with examples manifestly spurious, owing to the want of attention to the great principles of identification and authentication.

#### EXPLANATION OF PLATE XXXIX.

- Fig. 1. Egg of *Syrhaptus paradoxus*.  
 2. „ *Squatarola helvetica*.  
 3. „ *Lestris pomerinus*.  
 4. „ *Somateria stelleri*.  
 5. „ *Houbara macqueeni*.  
 6. „ *Egretta alba*.

#### 4. NOTE ON THE OCELLATED TURKEY OF HONDURAS. BY PHILIP LUTLEY SCLATER, M.A., F.R.S., SECRETARY TO THE SOCIETY.

(Plate XL.)

The drawings which I now exhibit (Plate XL.) are the results of careful studies by Mr. Wolf of the heads of the male and female of the Ocellated Turkey of Honduras (*Meleagris ocellata*, Temminck). The upper figure represents the head of the male bird, and the lower that of the female. It will be at once observable how peculiar the wattles are in this Turkey, and how different from those of the ordinary *Meleagris gallopavo* of the United States, and the closely allied *M. mexicana* of Mexico.

The first Ocellated Turkey in the Society's possession was a female bird, presented by the Earl of Ilchester in 1831.

In 1856 three Ocellated Turkeys were obtained in Honduras, and brought over to this country in the August of that year, by the combined care and skill of Mr. George M. Skinner and Capt. Wilson of the Royal Mail Steamship Company. They were placed by Her Majesty the Queen, to whom in the first instance they were presented,



PLATE XL.

M. & N. Hanhart Imp.

HEADS OF MELEAGRIS OCELLATA 1♂ 2♀



in the Society's Gardens in the September following, and we had for some time great hopes of inducing them to breed with us. But, although they lived nearly two years in the Menagerie, they were evidently not in good health, and died without young birds being obtained from them.

In April last our Corresponding Member Mr. Robert Owen, of San Geronimo in Guatemala, brought us home a single female of this species, which he had obtained from the district of Peten. On its arrival this bird was in very poor condition, but is now doing tolerably well. As Mr. Owen has returned to Guatemala, and promises us to use every effort to obtain more examples of this beautiful species, we need not yet despair of seeing the Ocellated Turkey established in our poultry-yards.

##### 5. CATALOGUE OF A COLLECTION OF MOLLUSKS FROM BERMUDA. By H. B. TRISTRAM, M.A., F.L.S., CORR. MEMB. Z.S.

Dr. Sclater having kindly intrusted to me a small collection of thirty species of Mollusks from Bermuda, presented to the Zoological Society by Colonel Freeman Murray, late Governor of the Bermudas, I have been induced, while cataloguing this collection, to make a list of the shells in my possession, which I obtained while resident for some time in those islands. My cabinet contains about 150 Bermudan species, including all those presented by Col. Freeman Murray. This list, however, might be indefinitely extended, as I unfortunately paid very little attention to the subject while in the islands, never used the dredge, nor collected systematically, so that nearly the whole of my species are from the laminarian zone, excepting a few gathered from the fishing-boats. I am not aware of any conchologist having yet systematically examined the coral-reefs or sandy bottoms of the Bermudas,—the only attempt at an enumeration of the Mollusks being, so far as I am aware, a most meagre list by Dr. Temple Prime of New York, slightly enlarged by Mr. Jones in his interesting little work 'The Naturalist in Bermuda.' These lists contain seven terrestrial Gasteropods with which I am unacquainted (five of them being new species), and thirteen marine species (three of them new, likewise wanting in my collection).

Although few of the Mollusks enumerated in this notice are new or peculiar to the Bermudas, yet the list presents some very interesting features with reference to the geographical distribution of the marine fauna of the Atlantic. While the Flora and Avifauna of Bermuda are identical with, and have doubtless been supplied from, the opposite coasts of North America, there being neither birds nor plants which are not common to Virginia in the same latitude, the marine fauna appears to be thoroughly West Indian. Of the whole number of shells, I have been able to identify only fourteen as common to the Virginian and Carolinan shores, and of these only one (*Lucina pennsylvanica*, Lam.) which is not included in the catalogues of the Bahamas or West Indies.

How clearly have the ocean currents registered their course in this fact. Although Bermuda is out of the course of the gulf-stream, lying as it does some fifty miles to the south-east of any perceptible current, yet it is not beyond its influence, as may be seen by the most casual observer in the masses of tangled gulf-weed which are washed on its shores. But beyond the gulf-stream to the westward, the polar current, narrowed indeed, but very perceptible, runs along the shores of Virginia, assimilating its marine fauna to that of New York, and chilling the life of those lovely corallines and zoophytes which have extended their range, under the fostering of the more genial gulf-stream, from the Bahama banks to the reefs of the Somers Islands.

It were much to be wished that some enterprising marine zoologist would undertake the examination of the reefs of Bermuda, and let down his dredge in the almost unvisited depths of Castle Harbour, and on the sandy surface of the great bank which extends for many miles to the southward, commencing at about thirty miles from the land, and running from east to west. On this bank the Grouper (*Serranus* —?), the cod of the Bermudas, is no less abundant than its northern representative off the island of Rockall.

*Catalogue of the Mollusca of Bermuda.*

<i>Spirula fragilis</i> , Lam.	<i>Columbella cribraria</i> , Sow.
<i>Strombus pugilus</i> , Linn.	— <i>nitidula</i> , Sow.
<i>Ranella caudata</i> , Say.	— <i>concinna</i> , Sow.
<i>Murex</i> —?	<i>Oliva fusiformis</i> , Lam.
— —?	— <i>reticulata</i> , Lam.
— —?	— <i>nivea</i> , Gmel.
<i>Pisania turbinella</i> , Kiener.	<i>Olivella eburnea</i> , Lam.
<i>Triton lotorium</i> , L.	— <i>jaspidea</i> , Gm.
— <i>femorale</i> , L.?	— <i>oryza</i> , Lam.
— <i>lanceolatus</i> , Menke.	— <i>bullula</i> , Sow.
— <i>tessellatus</i> , Reeve.	<i>Conus mus</i> , L.
— <i>chlorostoma</i> , Lam.	— <i>aurantius</i> , Brug.
<i>Mangelia</i> —?	— <i>verrucosus</i> , Brug.
— —?	— <i>nebulosus</i> , Sow.
<i>Buccinum plumatum</i> , Brug.	— <i>daucus</i> , Sow.
— <i>nucleus</i> , Brug.	<i>Mitra striatula</i> , Lam.
— <i>olivaceum</i> , Brug.	<i>Marginella pallida</i> , Lam.
— <i>ambiguum</i> , Dillw.	— <i>avena</i> , Val.
<i>Nassa</i> —?	— <i>varia</i> , Sow.
<i>Terebra hastata</i> , Kiener.	<i>Cypræa cinerea</i> , Gm.
<i>Purpura deltoidea</i> , Lam.	— <i>rotunda</i> , Say.
— <i>bicostalis</i> , Lam.	<i>Trivia quadripunctata</i> , Gray.
— <i>undata</i> , Lam.	— <i>pedicula</i> , L.
<i>Planaxis semisulcata</i> , Sow.	<i>Ovulum gibbosum</i> , L.
<i>Cassis testiculus</i> , L.	<i>Natica canrena</i> , L.
<i>Dolium perdix</i> , L.	— <i>clausa</i> , Sow.
<i>Columbella mercatoria</i> , Lam.	— <i>dillwynii</i> , Récluz.

- Natica sordida*, Swains.?  
*Cerithium mutabile*, Adams.  
 — *erianse*, Valen.  
 — *peloritatum*, Cant.  
 — *litratum*, Desh.  
 — *algicola*, Adams.  
*Vermetus knorrii*, Say.  
*Scalaria clathrus*, L.  
 — *tenuis*, Con.  
 — *fragilis*, Lam.  
*Littorina angulifera*, Lam.  
 — *ziczac*, Lam.  
 — *dilatata*, Adams.  
 — *muricata*, Adams.  
*Phorus agglutinans*, L.  
*Nerita peloronta*, L.  
 — *versicolor*, Lam.  
 — *tessellata*, Gmel.  
*Neritina viridis*, L.  
*Turbo pica*, L.  
*Imperator chemnitzii*, Desh.  
*Trochus modulus*, L.  
*Phasianella pulchella*, L.?  
 — *pullus*, Lam.  
*Ianthina fragilis*, Lam.  
*Fissurella barbadensis*, Lam.  
 — *cayennensis*, Lam.  
 — *listeri*, D'Orb.  
 — *græca*, Lam.  
 — *minuta*, Lam.  
*Emarginula* — ?  
*Calyptræa* — ?  
*Pileopsis militaris*, Lin.  
*Siphonaria picta*, Hanley.  
 — *brunnea*, Hanley.  
*Chiton squamosus*, L.  
*Helix bermudensis*, Pfr.  
 — *circumfirmatus*, Redf.  
 — *microdonta*, Desh.  
 — *paludosus*, Say.  
*Bulimus varicosus*, Drap.  
*Helicina variabilis*, Adams.  
*Succinea* — ?  
*Melampus coffea*, Lam.  
 — *fasciatus*, Chemn.
- Melampus oblongus*, Pfr.  
*Bulla occidentalis*, Lam.  
 — *media*, Lam.  
 — — ?  
 — — ?  
*Philine* — ?  
 — — ?  
*Pecten nodosus*, L.  
 — *ziczac*, Chemn.  
 — — ?  
*Lima tenera*, Chemn.  
 — *scabra*, Chemn.  
*Spondylus longitudinalis*, Lam.  
 — *digitalis*, Reeve.  
*Perna ephippium*, L.  
*Meleagrina placunoides*, Reeve.  
*Pinna rudis*, L.  
*Mytilus exustus*, Lam.  
 — *lavallianus*, D'Orb.  
*Modiola tulipa*, Lam.  
*Arca noæ*, L.  
 — *lactea*, L.  
*Chama iostoma*, Conrad.  
 — *macrophylla*, Chemn.  
*Cardium serratum*, L.  
*Lucina tigerina*, D'Orb.  
 — *pennsylvanica*, Lam.  
 — *muricata*, D'Orb.  
 — *pecten*, Lam.  
 — *squamosa*, Lam.  
*Tellina magna*, Spengler.  
 — *interrupta*, Wood.  
 — *lævigata*, Linn.  
 — *radiata*, L.  
 — *mera*, Say.  
 — *clausa*, Desh.  
 — *bimaculata*, L.  
 — *sexradiata*, Lam.  
*Capsa* — ? \*  
*Sanguinolaria rugosa*, Lam.  
*Semele subtruncata*, Sow.  
 — *obliqua*, Wood.  
*Solecurtus dombei*, Beck?  
*Pholas striata*, L.

\* In Mr. Cuming's collection, but unnamed.

6. INDEX GENERIS ELAINEÆ EX FAMILIA TYRANNIDARUM AD-  
DITIS NOVARUM SPECIERUM DIAGNOSIBUS. AUCTORE  
PHILIPPO LUTLEY SCLATER, A.M., Phil.D., Soc. ZOOL.  
LONDIN. SECR.

(Pl. XLI.)

Genus *Elainea* anno MDCCCXXXVI. a clarissimo Sundeval in Systemate suo Ornithologico fundatum, typum habet *Muscicapam paganam* Licht. Huic affines sunt variæ species, forma vix diversæ, coloribus fere similibus, et pellibus inter se diligentissime collatis vix dignoscendæ. Sedes generis est America tropica cum insulis Antillarum. Mihi notæ sunt species sequentes, quarum omnium specimina mecum teneo.

Div. *α*. *Capitis subcristati plumis interne albis.*

1. ELAINEA PAGANA.

*Muscicapa pagana*, Licht. Doubl. p. 54.—*Platyrhynchus paganus*, Spix.—*Muscicapa brevirostris*, Max.—*Elainea pagana*, Cab. in Schomb. Guian. iii. p. 701; Burm. Syst. Ueb. ii. p. 476; Cab. et Hein. Mus. Hein. p. 59.

*Hab.* In Brasilia or., Guiana, Venezuela, et ins. Tobago.

2. ELAINEA SUBPAGANA.

*Elainia subpagana*, Sclat. et Salv. Ibis, 1860, p. 36.

*Hab.* In Guatemala et Mex. merid.

3. ELAINEA SEMIPAGANA, sp. nov.

*E. obscure fusco-cinerea, capite nigricantiore, uropygio olivaceo induto: cristæ plumis ad basin cinerascensibus, vix albis: alis nigricantibus, harum secundariis et tectricibus majoribus et minoribus albo late limbatis: gula alba, pectore et lateribus subcinerascensibus: ventre medio et tectricibus subalaribus pallide flavicantibus: rostro nigro, mandibula inferiore cornea: pedibus nigris.*

Long. tota 6·0, alæ 3·0, caudæ 2·8 poll. angl. et dec.

*Hab.* In rep. Æquatoriana reg. occident.

*Obs.* Affinis *E. paganæ*, sed capite obscuriore et gutture albo, necnon colore supero cinerascensiore, minime brunneo, distinguenda.

4. ELAINEA RIISII.

*Elainea riisii*, Sclater, P. Z. S. 1860, p. 314; Newton in 'Ibis,' 1860, p. 307.

*Hab.* In ins. S. Thomæ, Antillarum.

5. ELAINEA ALBICEPS.

*Muscipeta albiceps*, Lafr. et D'Orb. Syn. Av. i. p. 47; D'Orb. Voy. Ois. p. 319.

*Elainea albiceps*, Sclater, P. Z. S. 1858, p. 71, et 1859, p. 46.

*Hab.* In Bolivia, Peruv. et rep. Æquat. orient.



PLATE 186.

W. J. G. S. 186. P. 14711

PLATE 186. P. 14711



## 6. ELAINEA MODESTA.

*Elainea modesta*, Tsch. Av. Consp. p. 14, et Faun. Per. p. 159 ; Sclater, P. Z. S. 1859, p. 26 ; Cab. et Hein. Mus. Hein. ii. p. 59.

*Hab.* In Peruv. orientali et Nov. Granada interiore.

## 7. ELAINEA GRISEIGULARIS.

*Elainia griseogularis*, Sclater, P. Z. S. 1858, p. 554, pl. 146. f. 1, et P. Z. S. 1859, p. 46.

*Hab.* In mont. reipubl. Æquatorialis et Chiliens.

*Obs.* Speciei præcedenti affinis, sed alis albo vittatis forsau diversa.

## 8. ELAINEA PALLATANGÆ, sp. nov. (Pl. XLI.)

*Brunnescenti-olivacea ; pilei subcristati plumis ad basin albis : alis fuscescenti-nigris, tectricum majorum et minorum apicibus et secundariorum marginibus apicalibus late et distincte albis : cauda fuscescenti-nigra, marginibus olivascentibus : subtus pallide stramineo-flava, gutture viridicantiore : rostro fusco, mandibula inferiore carnea, pedibus nigris.*

Long. tota 5·8, alæ 2·7, caudæ 2·3.

*Hab.* In rep. Æquat. Pallatanga (*Fraser*).

## 9. ELAINEA MESOLEUCA.

*Elainea mesoleuca*, Cab. et Hein. Mus. Hein. ii. p. 60.

*Hab.* In Brasilia merid. prov. Rivi Grandis.

## 10. ELAINEA FALLAX.

*Elainea fallax*, Sclater, P. Z. S. 1860, p. 314.

*Hab.* In ins. Jamaica.

## 11. ELAINEA CANICEPS.

*Tyrannula caniceps*, Sw. Orn. Dr. pl. 49 ; Bp. Consp. p. 191.

*Hab.* In Guiana et Cayenna.

Div. β. *Capitis subcristati plumis interne flavis.*

## 12. ELAINEA PLACENS.

*Elainia placens*, Sclater, P. Z. S. 1859, p. 46 ; Ibis, 1859, p. 123, pl. 4. fig. 2, et p. 443 ; Salvin, Ibis, 1860, p. 194.

*Hab.* In Mexico merid. et Guatemala.

## 13. ELAINEA SUBPLACENS, sp. nov.

*Supra cinerascenti-olivacea, pileo subcristato cinerascente, plumis mediallyter flavis : loris et regione oculari griseis : alis et cauda nigricantibus olivaceo limbatis : subtus pallide straminea, gutture toto cinerascenti-albo : tectricibus subalaribus stramineis : rostro nigro, mand. inf. ad basin alba : pedibus nigris.*

Long. tota 6·0, alæ 3·0, caudæ 2·8.

*Hab.* In rep. Æquator. Pallatanga (*Fraser*).

*Obs.* Similis *E. placenti* sed major, dorso cinerascentiore, et subtus pallidior.

14. *ELAINEA IMPLACENS*, sp. nov.

*Olivacea, alis et cauda fusciscenti-nigris, hac olivaceo, illis flavicanti-olivaceo terminatis: pileo subcristato cinerascenti-nigro, mediallyter aureo: superciliis et loris albis: subtus straminea; gutture albicante, pectore cinerascente induto: tectricibus subalaribus stramineis: rostro et pedibus nigris, illius mand. inf. ad basin carnea.*

Long. tota 5·0, alæ 2·5, caudæ 2·2.

*Hab.* In rep. Æquatoriana, Esmeraldas et Bahahoyo (*Fraser*).

*Obs.* Proxime accedit hæc species *E. placenti*, sed crassitie paulo minore, rostro latiore et corpore subtus dilutiore stramineo dignoscenda est.

15. *ELAINEA COTTA*.

*Elainea cotta*, Gosse, Ann. N. H. ser. 2. iii. p. 257, et Ill. B. Jam. pl. 45; Sclater, P. Z. S. 1861, p. 77.

*Hab.* Jamaica (*Gosse*).

Div.  $\gamma$ . *Capite unicolore.*

16. *ELAINEA RUSTICA*.

*Muscicapa rustica*, Licht. in Mus. Berol.—*Elainea obscura*, Cab. in Tsch. Faun. Per. p. 158; Cab. et Hein. Mus. Hein. ii. p. 66.

*Hab.* In Brasilia merid. et rep. Argentina.

*Obs.* Dubito an *M. obscura*, Lafr. et D'Orb. vere huc referenda sit.

17. *ELAINEA OLIVACEA*.

*Muscicapa olivacea*, Lafr. et D'Orb. Syn. Av. i. p. 54.—*Muscicapa boliviana*, D'Orb. Voy. Ois. p. 458.—*Elainea olivacea*, Sclater, P. Z. S. 1859, p. 46.

*Hab.* In Brasilia merid.

*Obs.* Species a præcedente (a *Muscicapa rustica*, Licht., saltem) vix distincta.

7. CONSPECTUS GENERUM LABROIDEORUM ANALYTICUS. AUCT. P. BLEEKER, SOC. ZOOL. LONDIN. SOCIO PEREGR.

I. CHEILINIFORMES=*Julidina*, Günth., ex parte.

Corpus oblongum compressum, capite corporeque squamis magnis vestitis, squamis genarum biseriatis, corporis 22 ad 25 in serie longitudinali, caudalibus posticis 3 elongatis, ceteris majoribus. Caput non carinatum. Dentes maxillis conici, antici 2 ad 8 canini, angularis nulli. Os pharyngeale inferius corpore triangulari, dentibus conicis vel graniformibus 1- ad 4-seriatis. Pinnæ dorsalis et

Analisis basi vagina squamosa, spinis pungentibus, dorsali 9 ad 11, anali 3. Dentes, spinæ radiique viridescentes.

A. Linea lateralis interrupta.

a. Præoperculum edentulum.

aa. Maxillæ parum protractiles.

† Dentes canini utraque maxilla 4. Squamæ corporis 22 vel 23 in serie longitudinali. Spinæ dorsales 9 vel 10. Spina analis posterior ceteris longior. B. 5.

*Cheilinus*, Lac.

† Dentes canini maxilla superiore 8, externi ceteris longiores, maxilla inferiore 2. Squamæ corporis 24 in serie longitudinali. Spinæ dorsales 9. Spina analis media ceteris longior. B. 6.

*Pseudocheilinus*, Blkr. (sp. typ. *Cheilinus hexatænia*, Blkr.).

bb. Maxillæ in tubum horizontalem protractiles. Os jugale elongatum cum maxilla inferiore articulatam.

† Dentes canini utraque maxilla 2. Squamæ suboperculo-interoperculares elongatæ, corporis 22 in serie longitudinali. Spinæ dorsales 9. B. 5.

*Epibulus*, Cuv.

b. Præoperculum denticulatum. Maxillæ parum protractiles. Dentes canini maxilla superiore 6, maxilla inferiore 2. Squamæ corporis 24 vel 25 in serie longitudinali. Spinæ dorsales 11. B. 5.

*Cirrhilabrus*, Schl.

B. Linea lateralis continua. Præoperculum denticulatum. Maxillæ parum protractiles. Dentes canini utraque maxilla 4. Squamæ corporis 24 vel 25 in serie longitudinali. Spinæ dorsales 9, anteriores plus minusve filigeræ. B. 5.

*Duymæria*, Blkr.

II. PSEUDODACIFORMES = *Pseudodacina*, Günth.

Corpus oblongum compressum, capite squamis medioeribus, trunco squamis magnis vestito, squamis genarum pluriseriatis, trunci 33 p. m. in linea laterali, caudalibus posticis 5 elongatis ceteris majoribus. Caput non carinatum. Pinnæ dorsalis et analis basi squamosæ, spinis pungentibus dorsali 11, anali 3. Dentes canini securiformes vel incisivi maxilla superiore 2, maxilla inferiore 4. Os pharyngeale inferius corpore scaphiformi, dentibus pavimentatis. Præoperculum edentulum. Linea lateralis continua. B. 6.

*Pseudodax*, Blkr. (sp. typ. *Odax moluccanus*, Cuv.).

III. CHEILIONIFORMES=*Julidina*, Günth., ex parte.

Corpus elongatum cylindraceum, squamis mediocribus (46 ad 48 in linea laterali) vestitum, squamis caudalibus posticis, mediana acuta excepta, ceteris non majoribus. Caput non carinatum, acutum. Dentes maxillis cristales acuti compressi. Os pharyngeale inferius corpore triquetro, dentibus conico-graniformibus pluri-seriatis. Præoperculum ætate juvenili denticulatum. Linea lateralis continua. Spinæ dorsales flexiles 9. B. 6.

*Cheilio*, Comm.

IV. PSEUDOLABRIFORMES=*Julidina*, Günth., ex parte.

Corpus oblongum vel elongatum compressum, squamis magnis aut parvis (26 ad plus quam 120 in linea laterali), squamis caudalibus posticis ceteris non majoribus. Caput non carinatum. Dentes maxillis, quum adsunt, conici. Os pharyngeale inferius corpore triquetro, dentibus conicis vel graniformibus uni- aut pluri-seriatis. Præoperculum edentulum. Spinæ dorsales 8 vel 9, membrana inter singulas spinas nec incisa nec lobata. B. 6.

A. Linea lateralis continua. Spinæ anales 3.

a. Spinæ dorsales 8. Pinnæ dorsalis et analis basi squamosæ; spinæ omnes pungentes. Squamæ corporis magnæ, 28 vel 29 in linea laterali. Dentes intermaxillares angulares nulli. Os pharyngeale inferius corpore ad marginem posteriorem rectiusculo, dentibus 3- ad 4-seriatis conicis vel graniformibus, serie posteriore ceteris majoribus.

aa. Rostrum elongatum valde acutum. Maxillæ longe ante oculum desinentes. Dentes canini 2 intermaxillares tantum, curvati.

*Gomphosus*, Lac.

bb. Rostrum breve obtusum. Maxilla superior sub oculo vel vix ante oculum desinens. Dentes utraque maxilla canini 2 curvati prominentes.

*Julis*, Cuv., Günth.

b. Spinæ dorsales 9.

aa. Caput ubique alepidotum.

† Squamæ corporis parvæ 70 ad plus quam 120 in linea laterali.

♂ Os pharyngeale inferius corpore margine posteriore concavo, dentibus serie posteriore subæqualibus.

♀ Squamæ 110 ad 120 p. m. in linea laterali. Corpus elongatum. Labia valde carnosæ. Dentes canini utraque maxilla 4 curvati, angulares nulli. Spinæ dorsales omnes flexiles non pungentes. Pinna caudalis angulis non productis.

*Hologymnosus*, Lac. (sp. typ. *Hologymnosus fasciatus*, Lac.).

♂' Squamæ 76 p. m. in linea laterali. Corpus oblongum. Labia gracillima. Dentes canini utraque maxilla 2 recti, angulares utroque latere 2. Spinæ dorsales, anterioribus 2 exceptis, leviter pungentes. Pinna caudalis angulis filigera.

*Pseudocoris*, Blkr. (sp. typ. *Julis* [*Halichæres*] *heteropterus*, Blkr.).

♂' Os pharyngeale inferius corporis margine posteriore non concavo, dente in serie posteriore mediano obtuso, ceteris majore.

♀ Squamæ 70 ad 80 p. m. in linea laterali. Corpus oblongum vel subelongatum. Labia valde carnosa. Dentes canini utraque maxilla 2 ad 4 curvati. Spinæ dorsales, anterioribus 2 interdum exceptis, pungentes. Pinna caudalis angulis non producta.

*Coris*, Lac., Günth., ex parte.

†' Squamæ corpore magnæ vel mediocres 26 ad 55 p. m. in linea laterali. Spinæ dorsales omnes pungentes.

♂ Dentes canini utraque maxilla 2 heteromorphi, intermaxillares securiformes. Squamæ 27 ad 52 in linea laterali. Pinnæ dorsalis et analis basi alepidotæ. Os pharyngeale inferius corpore margine posteriore rectiusculo, dentibus biseriatis, serie posteriore compressis, apicibus acutis.

*Anampses*, Cuv.

♂' Dentes canini utraque maxilla 2 vel 4 conici curvati. Squamæ thoraco-ventrales in medio corpore minores.

♀ Os pharyngeale inferius corpore margine posteriore non concavo, dentibus conico-graniformibus 3-seriatis, serie posteriore mediano ceteris majore.

♂ Squamæ corpore 50 ad 55 in linea laterali. Pinnæ dorsalis et analis basi alepidotæ. Maxilla superior dente angulari.

*Hemicoris*, Blkr. (sp. typ. *Halichæres variegatus*, Rüpp.).

♂' Squamæ corpore 27 ad 30 in linea laterali.

♀ Pinnæ dorsalis et analis basi squamatæ. Maxilla superior dente angulari. Corpus oblongum. Dentes maxillis uniseriati.

*PlatyGLOSSUS*, Klein (sp. typ. *Julis* [*Halichæres*] *annularis*, K. v. H.).

♀' Pinnæ dorsalis et analis basi alepidotæ.  
Dentes maxillæ intracristales graniformes.

⊖ Maxilla superior dente angulari. Dentes canini utraque maxilla 2 ad 4. Corpus oblongum.

*Halichæres*, Rüpp., Günth.

⊖' Maxilla superior dente angulari nullo. Dentes canini in utraque maxilla 2 parum curvati. Corpus elongatum.

*Pseudojulis*, Blkr. (sp. typ. *Julis girardi*, Blkr.).

♂' Os pharyngeale inferius corpore margine posteriore concavo, dentibus triseriatis, in serie posteriore conicis subæqualibus. Squamæ 28 in linea laterali. Pinnæ dorsalis et analis basi alepidotæ. Maxilla superior dente angulari. Dentes canini in utraque maxilla 4, laterales magni retrorsum curvati. Corpus elongatum.

*Leptojulis*, Blkr. (sp. typ. *Julis* [*Halichæres*] *cyanopleura*, Blkr.).

♂'' Os pharyngeale inferius corpore margine posteriore valde convexo, corpore ipso dentibus 3 tantum, et horum medio molari maximo. Squamæ 28 in linea laterali. Pinnæ dorsalis et analis basi alepidotæ. Maxilla superior dente angulari. Dentes canini in maxilla superiore 4, maxilla inferiore 2. Dentes intermaxillares cristales, ad maxillam adnati vix conspicui. Corpus oblongum.

*Macropharyngodon*, Blkr. (sp. typ. *Julis geoffroyi*, Q.).

♂'' Dentes maxillarum uniseriati, canini nulli. Maxilla superior dente angulari. Squamæ 27 in linea laterali, thoraco-ventrales in medio corpore majores vel non minores. Pinnæ dorsalis et analis basi vix vel non squamatæ. Os pharyngeale inferius corporis margine posteriore concavo, dentibus biseriatis, in serie posteriore compressis subæqualibus. Venter carinatus. Squama in linea laterali posterior lanceolata.

*Stethojulis*, Günth.

bb. Caput squamatum. Squamæ corporis magnæ vel mediocres 26 ad 55 p. m. in linea laterali. Maxilla superior dente angulari. Pinnæ dorsalis et analis basi squamatæ. Os pharyngeale inferius corporis margine posteriore non concavo, dente in serie posteriore mediano ceteris majore, obtuso.

† Genæ alepidotæ. Labia mediocriter carnosæ. Pinnæ dorsalis et analis basi vagina squamosa humillima. Dentes canini in utraque maxilla 4 curvati. Os pharyngeale inferius corpore dentibus triseriatis. Squamæ corporis magnæ 27 vel 28 in linea laterali.

♂ Squamæ capitis in operculo superne tantum.

*Güntheria*, Blkr. (sp. typ. *Halichoeres cœruleovittatus*, Rüpp.).

♂' Squamæ capitis in regione postoculari et operculo superne tantum.

*Hemitautoga*, Blkr. (sp. typ. *Labrus centiquadrus*, Comm., Lac.).

♂' Squamæ 53 p. m. in linea laterali. Caput magnum obtusum, maxilla inferiore lata prominente.

*Ophthalmolepis*, Blkr. (sp. typ. *Julis lineolatus*, Val.).

†' Genæ squamosæ squamis bi- ad pluriseriatis. Os pharyngeale inferius corpore dentibus quadriseriatis. Pinnæ dorsalis et analis basi valde squamosæ.

♂ Operculum superne tantum squamatum. Dentes canini utraque maxilla 2 recti. Labia lata maxime carnosæ.

*Hemigymnus*, Günth.

♂' Operculum totum squamosum, squamis magnis bi- aut pluriseriatis. Dentes canini utraque maxilla 4 curvati. Labia mediocriter carnosæ.

*Pseudolabrus*, Blkr. (sp. typ. *Labrus rubiginosus*, Schl.).

B. Linea lateralis interrupta. Spinæ dorsales 9.

a. Dentes maxillis uniseriati. Maxilla superior dente angulari, Squamæ corpore valde magnæ. Pinna dorsalis spinosa medio depressa. Spinæ anales 3 (Diagnosis *Güntheriana*).

*Doratonotus*, Günth. (Genus mihi incognitum).

b. Dentes maxillis bi- aut pluriseriati, intracristales, graniformes, cristales conici, antici 2 canini curvati, angulares nulli. Pinnæ dorsalis et analis basi alepidotæ. Os pharyngeale inferius corporis margine posteriore concavo, dentibus in serie posteriore subæqualibus.

- aa.* Spinæ dorsales anteriores 2 flexiles, ceteræ pungentes. Spinæ anales 3. Squamæ regionibus post- et suboculari uni- aut pluriseriatæ, corpore 27 vel 28 in serie longitudinali. Os pharyngeale inferius corpore dentibus 4- ad 5-seriatis.

*Novaculichthys*, Blkr. (sp. typ. *Labrus tæniurus*, Lac.).

- bb.* Spinæ dorsales anteriores 2 rigidæ non pungentes, ceteræ pungentes. Spinæ anales 2. Squamæ corpore 90 circiter in serie longitudinali. Os pharyngeale inferius, corpore dentibus triseriatis.

*Cymolutes*, Günth.

V. NOVACULÆFORMES=*Julidina*, Günth., ex parte.

Corpus oblongum valde compressum, squamis magnis (28 ad 30 in serie longitudinali) vestitum, squamis caudalibus posticis ceteris non majoribus. Caput carinatum valde convexum rostro obtusissimo. Squamæ capitis parvæ. Dentes canini in utraque maxilla 2 curvati, angulares nulli. Os pharyngeale inferius, corpore valido triquetro, dentibus conicis 3- ad 5-seriatis. Præoperculum edentulum. Linea lateralis interrupta. Pinnæ dorsalis et analis basi alepidotæ, dorsalis spinis 2 anterioribus flexilibus. B. 6.

A. Genæ mediæ alepidotæ. Squamæ postoculares uniseriatæ.

- a.* Spinæ dorsales 2, anteriores a ceteris non separatæ, non productæ, anterior post oculum inserta.

*Novacula*, Rüp., Cuv., Val., ex parte.

- b.* Spinæ dorsales 2, anteriores longe a ceteris distantes, in pinnam accessoriam separatæ, anterior supra oculum inserta.

*Xyrichthys*, Cuv., Val., ex parte (sp. typ. *Xyrichthys pavo*, Val.).

B. Genæ mediæ squamis pluriseriatis. Spinæ dorsales 2, anteriores sequentibus longiores, anterior ante præoperculi marginem posteriorem inserta.

*Hemipteronotus*, Lac., Blkr. (sp. typ. *Hemipteronotus quinquemaculatus*, Lac.).

VI. LABRICHTHYIFORMES=*Julidina*, Günth., ex parte.

Corpus oblongum vel subelongatum, compressum, squamis magnis vel mediocribus (27 ad 50 in linea laterali) vestitum, squamis caudalibus posticis ceteris non majoribus. Caput non carinatum, acutum, squamatum. Spinæ dorsales 9, omnes pungentes. Dentes maxillarum canini curvati 2 ad 4. Maxilla superior dente angulari. Os pharyngeale inferius corpore gracili lineari, dentibus acutis uniseriatis. Præoperculum edentulum. Linea lateralis continua. Membrana pinnæ dorsalis nec incisa nec lobata. B. 5.

- A. Squamæ corporis 27 p. m. in linea laterali. Caput antice, lateraliter inferneque squamosum. Dentes canini maxilla superiore 4, maxilla inferiore 2. Labium inferius lobatum fimbriatum. Pinnæ dorsalis et analis basi valde squamosæ. Spinæ anales 3.

*Labrichthys*, Blkr. (sp. typ. *Labrichthys cyanotænia*, Blkr.).

- B. Squamæ corpore mediocres, 40 ad 50 in linea laterali. Caput genis et operculis tantum squamosum. Dentes canini utraque maxilla 2.

- a. Labium inferius antice in lobos 2 oblongos distantes productum. Pinnæ dorsalis et analis basi alepidotæ. Squamæ corporis 48 ad 50 in linea laterali. Spinæ anales 3.

*Labroides*, Blkr. (sp. typ. *Labroides paradiseus*, Blkr.).

- b. Labium inferius lobis productis nullis. Pinnæ dorsalis et analis basi leviter squamatae. Squamæ corporis 40 in linea laterali. Spinæ anales 2.

*Diproctacanthus*, Blkr. (sp. typ. *Labroides xanthurus*, Blkr.).

VII. COSSYPHIFORMES = *Julidina*, Günth., ex parte + *Hypsigenina*, Günth.

Corpus oblongum compressum, squamis magnis vel mediocribus (25 ad plus quam 50 in linea laterali) vestitum, squamis caudalibus posticis mediocribus interdum acuminatis. Caput non carinatum, squamatum, squamis operculi magnis. Dentes maxillarum canini 4, magni, curvati. Os pharyngeale inferius corpore triquetro, dentibus graniformibus pavementatis. Præoperculum ætate juvenili denticulatum. Linea lateralis continua. Spinæ dorsales pungentes 10 ad 13, anales 3.

- A. Pinnæ dorsalis et analis basi alepidotæ. B. 6.

- a. Labium superius compressum ensiforme. Squamæ genis 3-seriatae, trunco magnæ, 28 p. m. in linea laterali. Caput valde obtusum. Spinæ anales 12. Maxilla superior dente angulari. Squamæ caudales posteriores 5 ad 7 lanceolatae.

*Xiphocheilus*, Blkr.

- b. Labium superius valde carnosum. Squamæ genarum pluri-seriatae, trunci magnæ vel mediocres, 30 ad 50 p. m. in linea laterali. Spinæ dorsales 12 vel 11. Maxilla superior dente angulari, interdum deficiente.

- aa. Squamæ 50 p. m. in linea laterali. Præoperculum limbo alepidotum. Maxilla superior dente angulari nullo.

*Semicossyphus*, Günth.

*bb.* Squamæ 45 ad 62 in linea laterali; præoperculum limbis alepidotis; maxillæ superioris dente angulari (Diagnosis *Güntheriana*).

*Trochocopus*, Günth. (Gen. mihi incogn.).

*cc.* Squamæ 30 p. m. in linea laterali. Præoperculum limbo inferiore squamatum.

*Decodon*, Günth. (Gen. mihi incogn.).

**B.** Pinnae dorsalis et analis basi squamosæ. Squamæ corporis magnæ (25 ad 36 in linea laterali), genarum pluriseriatæ.

*a.* Spinæ dorsales 10 vel 11. Squamæ 25 p. m. in linea laterali. B. 5. Caput acutum.

*Pteragogus*, Peters (Genus mihi incognitum).

*b.* Spinæ dorsales 12. Squamæ 30 ad 36 in linea laterali. B. 6. Labium superius ore clauso labio suborbitali non occultum.

*Cossyphus*, Val.

*c.* Spinæ dorsales 13. Squamæ 28 vel 29 in linea laterali. B. 6. Labium superius ore clauso antice totum labio suborbitali occultum. Caput valde convexum obtusum. Squamæ caudales posticæ 5 ad 7 plus minusve elongatæ.

*Charops*, Rüpp. = *Hypsigenys*, Günth. = *Cossyphodes*, Blkr.

### VIII. LABRIFORMES = *Labrina*, Günth.

Corpus oblongum vel subelongatum compressum, squamis magnis aut parvis (30 ad 70 in linea laterali) vestitum. Caput non carinatum. Genæ squamosæ. Labia carnosæ. Dentes maxillis uni- aut pluriseriatis, angulares nulli. Os pharyngeale inferius corpore triquetro, dentibus conicis vel conico-graniformibus tri- aut pluriseriatis, non pavimentatis. Spinæ dorsales a 13 ad plus quam 20, anales a 3 ad 6. Membrana pinnae dorsalis inter singulas spinas incisa lobata. Linea lateralis continua.

**A.** Spinæ dorsales pungentes.

*a.* Spinæ dorsales 16 ad 21, anales 4 ad 6. Squamæ corporis mediocres, 35 ad 45 p. m. in linea laterali. Operculum squamosum.

*aa.* Pinna dorsalis basi squamosa. Dentes maxillarum pluriseriatis, antici canini.

*Acantholabrus*, Val., ex parte.

*bb.* Pinna dorsalis basi alepidota. Dentes maxillarum uniseriatis, canini nulli.

*Centrolabrus*, Günth.

## b. Spinæ anales 3. Pinna dorsalis basi alepidota

## aa. Operculum squamosum.

† Dentes maxillis canini curvati 2 ad 4.

♂ Interoperculum squamatum. Dentes canini 4.

♀ Dentes maxillis uniseriati. Spinæ dorsales 15, anteriores filigeræ. Squamæ 35 ad 45? in linea laterali. B. 6.

*Lachnolaimus*, Cuv.

♀' Dentes maxillis pluriseriati. Spinæ dorsales 17. non filigeræ. Squamæ 35 ad 37 in linea laterali. B. 5.

*Ctenolabrus*, Val.

♂' Interoperculum non squamatum. Dentes maxillis uniseriati, canini 2 ad 4. Squamæ 40 ad plus quam 50 in linea laterali. Spinæ dorsales 16 ad 21, non filigeræ. B. 5.

*Labrus*, L.

†' Dentes maxillis uniseriati, canini nulli. Interoperculum squamatum. Squamæ 30 ad 36 in linea laterali. Spinæ dorsales 13 ad 17. B. 5.

♂ Maxillæ non aut vix protractiles. Rostrum non productum. Spinæ dorsales 13 ad 17.

*Crenilabrus*, Cuv.

♂' Maxillæ valde protractiles. Caput valde acutum. Spinæ dorsales 15.

*Coricus*, Cuv.

bb. Operculum alepidotum. Dentes maxillis canini 4 compressi. Squamæ 60 ad 70 in linea laterali. Spinæ dorsales 17. B. 5.

*Tautoga*, Mitch.

B. Spinæ dorsales flexiles 18, anales 3. Dentes maxillis uniseriati, canini 2. Operculum limbo tantum squamatum. Squamæ 37 p. m. in linea laterali. Pinna dorsalis et analis basi alepidotæ.

*Malapterus*, Val.IX. ODACIFORMES = *Odacina*, Günth.

Corpus subelongatum vel elongatum, compressum, squamis parvis (55 ad 90 in linea laterali) vestitum, squamis caudalibus posticis ceteris non majoribus. Caput non carinatum, acutum. Dentes maxillis adnatæ aggregatæ. Os pharyngeale inferius corpore triquetro dentibus pavimentatis. Præoperculum edentulum. Spinæ dorsales flexiles 15 ad 24. Linea lateralis continua.

- A. Caput operculis regioneque postoculari squamosum. Spinæ anales 2. B. 5.

*Odaa*, Cuv.

- B. Caput, regione supraoperculari excepta, alepidotum. Spinæ anales 3. Squamæ parvæ (Diagnosis *Güntheriana*).

*Coridodaa*, Günth. (Gen. mihi incogn.).

- C. Caput, regione supraoperculari excepta, alepidotum. Spinæ anales 3, dorsales anteriores ceteris longiores. Squamæ mediocres.

*Olisthops*, Richds.

X. CLEPTICIFORMES = *Julidina*, Günth. ex parte.

Corpus oblongum, compressum, squamis magnis (34 p. m. in linea laterali) vestitum, caudalibus posticis ceteris non majoribus. Caput non carinatum, obtusum, totum fere squamosum. Oculi posteriori. Maxillæ tenues, in tubum horizontalem protractiles, labiis tenuibus, inferiore membranaceo ante maxillam pendulo. Rictus maxillis retractis subverticalis. Dentis intermaxillares uniseriati, recti, antrorsum spectantes, subæquales, inframaxillares laterales conspicui nulli, antici 2 caninoidei, recti, antrorsum spectantes. Os pharyngeale inferius corpore gracili, dentibus conicis 3- ad 4-seriatis. Linea lateralis continua. Pinnæ dorsalis et analis basi valde squamosæ, spinis pungentibus dorsalibus 12, analibus 3. B. 6.

*Clepticus*, Cuv.

Scripti Lugdun. Batav., Calend. Novembr. 1861.

7. SOLENACEA NOVA COLLECTIONIS CUMINGIANÆ DESCRIPTA A GUILIELMO DUNKER.

1. SOLEN GRANDIS, Dkr.

*Testa linearis, recta, magna, solida, striis incrementi obsoletis et epidermide lævi cornea instructa; extremitas antica acute marginata, oblique truncata, neququam sulcata; extremitas postica rotundata, haud angusta. Color sub epidermide albus, strigis roseis, ex parte subfuscis, striis incrementi parallelis picta; pagina interna alba, posticum marginem versus rosea.*

Concha usque ad 144 mm. longa, 32 alta, et 21 lata, quasi intermedia inter *Solenem ceylanensem* et *brevem*. A *S. ceylanensi* præsertim differt latere postico plus minusve rotundato, a *S. brevi* pictura aliena, margine dorsi et basis prorsus parallelis, ita ut testa postice haud angustata appareat. Præterea angulus, qui formatur linea basis cum margine oblique truncato plerumque acutior est quam in illa specie.

*Hab.* Ad Philippinas insulas (*H. Cuming*).

## ✓ 2. SOLEN REGULARIS, Dkr.

*Testa linearis, recta, in utraque extremitate oblique truncata, alba, unicolor, epidermide pallide olivacea vestita; margo anticus simplex, haud sulcatus, intus incrassatus, cum margine inferiore angulum acutum formans, angulus lateris postici oppositus obtusus.*

Concha 70 mm. longa, 15 alta, 10 lata, habitu maxime convenit cum *Solene schultzeano*, Dkr. (Novit. Conch. vol. i. p. 8, t. 3. f. 1), sed latere postico oblique truncato, margine antico parallelo plurimum differt. Unica *Solenum* species est marginibus tam exacte parallelis circumscripta, quæ nobis in conspectum venit.

*Hab.* Malacca (*H. Cuming*).

## ✓ 3. SOLEN FONESII, Dkr.

*Testa linearis, recta, glabrata, convexiuscula, albida, subdiaphana, epidermide cornea induta; margo dorsi et ventris fere exacte paralleli; extremitas antica oblique truncata, abrupta, non sulcata, inferne acuta, intus paullo incrassata; extremitas postica rotundata. Margo anticus linea pallidiore insignis, lineis obscurioribus utrinque terminata. Epidermidis color corneus in area triangulari subcanus.*

Concha 73 mm. longa, 15 alta, vix 10 lata, a *Solene schultzeano*, cui simillima est, testa majore, altiore, tenuiore, lævissima, pellucida, quasi vitrea differt.

*Hab.* In littore Australiæ septentrionalis (*Mr. Strange*).

## ✓ 4. SOLEN EXIGUUS, Dkr.

*Testa parva, brevis, linearis, solidula, unicolor alba, epidermide cornea subolivacea induta; margo anticus abrupte truncatus, superne et inferne paullo rotundatus, margo posticus rotundatus subobliquus; linea dorsalis basi exacte parallela.*

Long. testæ 40 mm., alt. vix 10, latit. 4, 5.

*Hab.* Borneo (*H. Cuming*).

## ✓ 5. SOLEN LEANUS, Dkr.

*Testa parva, brevis, linearis, tenuis, unicolor alba, epidermide cornea lævigata obducta; margo anticus abrupte truncatus acutus, vix canaliculatus, margo posticus rotundatus; dorsum basi fere parallelum.*

Long. testæ 40, alt. 8, latit. 5 mm.

*Soleni exiguo* similis est, sed testa tenuiore, angustiore, minus convexa, latere antico subcanaliculato differt.

*Hab.* In Philippinis insulis (*H. Cuming*).

## 6. SOLEN MALACCENSIS, Dkr.

*Testa linearis, recta, utrinque truncata, angusta, obsoletissime striata, epidermide tenui pallide olivacea obducta, alba, maculis nonnullis flammisque lividis perpendiculatis variegata; extremitas antica sulco levi signata.*

Testa 115 mm. longa, 17 alta, 11 lata. A *Solene vagina* Linnæi differt sulco multo minore et leviore, necnon pictura.

*Hab.* Malacca (*H. Cuming*).

7. SOLEN VITREUS, Dkr.

*Testa parva, brevis, linearis, lactea, pellucida, epidermide tenuissima, pallide cornea, virescente induta, extus subcanaliculata, intus paullulum incrassata; extremitas postica acute truncata.*

Conchula modo 42 mm. longa, 10 alta, 6 lata, vitrea, valvulis fragilibus, tenuissimis, pellucidis insignis est. Dorsum margini basis parallelum.

*Hab.* Malacca (*H. Cuming*).

8. SOLEN ASPERSUS, Dkr.

*Testa angusta, linearis, subarcuata, tenuis, lævigata, nitida, modice convexa, antice truncata, postice paullo rotundata, albida, maculis irregularibus purpureo-fuscis adpersa; epidermis tenuissima, decidua, diaphana, vitrea; extremitas antica leviter canaliculata, paullulum coarctata.*

Hæc species 85 mm. longa, 12 alta, 8 lata, a *Solene philippiano* Dkr. (*vaginoides*, Phil. non Lam.) forma angustiore, parte postica subattenuata, valvulis lævigatis et epidermide tenuiore, quasi vitrea, satis differre videtur. Quænam sit species *Solen pictus* Philippii (*Zeitschr. f. M.* 1848, p. 174) discernere non potui; hæc autem a nostra specie forma cylindracea, abbreviata, canaliculo omnino carente abhorret.

*Hab.* Australia (*Mr. Strange*).

9. SOLEN PFEIFFERI, Dkr.

*Testa linearis, brevis, paullo curvata, solidula, convexa, alba, area zonis fulvis picta; margines dorsi et basis exacte paralleli, aliquantulum curvati, extremitas antica oblique truncata, sulcata, supra et infra obtusa; extremitas postica rotundato-truncata, margini antico subparallela; epidermis olivacea.*

Species parva, callosa, 52 mm. longa, 10 alta, 7 lata.

*Hab.* Caraccas, West Columbia (*H. Cuming*).

10. SOLEN WOODWARDI, Dkr.

*Testa linearis brevis, paullo curvata, plano-convexa, lævis, antice abrupte truncata, postice rotundata, sordide alba, epidermide cornea nitida induta; margo dorsi et basis pæne omnino paralleli.*

Species parva 53 mm. longa, 12 alta, 7 lata, unicolor, ad eos *Solenes* pertinet, qui canaliculo levi in margine antico gaudent.

*Hab.* Ad insulam Zebu Philippinarum (*H. Cuming*).

11. SOLEN ROSTRUM-ANATIS, Dkr.

*Testa recta lineari-ovalis, convexiuscula, antice declivis, subrotundata, postice producta, paullulum attenuata, æqualiter rotundata, intus extusque purpurea, striis incrementi tenerrimis strigillisque nonnullis ab apicibus radiantibus instructa, epidermide*

*nitidissima subviridi, partem posticam versus vivide olivacea, et subrugosa vestita.*

Concha 72 mm. longa, 19 alta, ad umbones 10 lata est. Species singularis a *Solenibus* reliquis facile distinguitur toto habitu, margine antico declivi rotundato, basin versus producto, necnon extremitate postica, quæ rostro anatis haud dissimilis est. Cardinis structura veris *Solenibus* plane respondet. In superiore valvarum parte color purpureus sub epidermide translucet; partem posticam versus valvæ planiores fiunt.

*Hab.* Patria ignota.

✓ 12. SOLEN ROSTRIFORMIS, Dkr.

*Testa subovalis, convexiuscula, tenuis, antice arcuato-truncata, postice sensim attenuata, rostriformis; margo basis subarcuatus; color rubescens; epidermis tenuis, lævis, nitidissima, subviridis; extremitas antica leviter sulcata.*

Concha 55 mm. longa, ad umbones 10 alta, et circa 7 lata, a specie, quæ antecedit, testa minore, tenuiore, antice magis derupta, postice angustiore, necnon colore pallidiore facile distingui potest.

*Hab.* Patria ignota.

13. ENSIS LUZONICUS, Dkr.

*Testa linearis, subarcuata, solidula, concentrice striata, postice subsulcata, tota alba, epidermide pallide cornea vestita; extremitas antica rotundata, postica parum attenuata, rotundato-truncata; margo superior et inferior subparalleli; cardo denticulis exilibus curvis munitus, uno majore irregulari cum adjacenti minore in dextra, duobus curvis in sinistra valva; ligamentum quartam testæ partem occupans, haud prominens. Umbones decorticati testam ostendunt cretaceam.*

Long. 77 mm., alt. 14.

*Hab.* Ad insulam Luzon Philippinarum (*H. Cuming*).

14. CULTELLUS HANLEYI, Dkr.

*Testa recta lineari-ovalis, plano-convexa, utrinque rotundata, concentrice tenerrimeque striata, pæne glabra; color totus albus; epidermis lævis, tenuis, straminea.*

Specimen quod exstat maximum 66 mm. longum, 19 altum, et 9 latum est.

Species ambitu variabilis *Cultello maximo* affinis, sed multo minor. Dentes divergentes irregulares, basis et margo cardinalis paullo curvati. Sub vitro lineæ nonnullæ impressæ, striis concentricis parallelæ, ab umbonibus radiantes observari possunt.

15. CULTELLUS SUBELLIPTICUS, Dkr.

*Testa longe ovalis, subelliptica, tenuis, plano-convexa, utrinque rotundata, antice subattenuata, postice dilatata, tenerrime striata, alba, nitida, epidermide pallida tenuissime obducta.*

Long. 46, alt. 16, latit. 7 mm.

Concha marginibus pæne æqualiter curvatis subelliptica apparet. Cardo in utraque valvula bidentatus est; dens valvulæ dextræ anterior angustus, bifidus, a dentibus duobus valvulæ oppositæ recipitur. Ligamentum angustum et breve est.

*Hab.* Malacca (*H. Cuming*).

16. *CULTELLUS ATTENUATUS*, Dkr.

*Testa recta linearis, concentrice tenerrimeque striata, pæne lævis, utrinque rotundata, postice producta, sensim attenuata, tota alba, epidermide pallida, tenuissima, nitida obtecta.*

Long. 57 mm., alt. 15, et lat. 6.

Conchula in antica longitudinis parte altissima est, extremitatem posticam versus coarctata. Dentes vix divergunt; in valvula sinistra duo observantur, anticus simplex, posticus late fissus, ita ut cardo tridentatus appareat. Ligamentum brevissimum est.

*Hab.* Ad Philippinas insulas (*H. Cuming*).

17. *CULTELLUS POLITUS*, Dkr.

*Testa utrinque rotundata, tenuis, complanata, subtilissime striata, pæne glabra, tota alba, epidermide nitidissima, pallida, subolivacea induta. Cardo utrinque callo elevato munitus denticulisque exilibus instructus, valva dextra unico, sinistra duobus, qui inter se excipiunt denticulum oppositum. Ligamentum, ut solet, exiguum, haud prominens.*

Long. 67, alt. 15, lat. 5 mm.

Species singularis, certe rara. Epidermis radio albo lato ab umbombus minimis ad latus posticum decurrente, necnon radio obscuriore antico insignis est. In media testa strigillas parvulas radiatim ordinatas sub vitro invenies.

*Hab.* In ostiis Gambiæ fluminis (*H. Cuming*).

18. *CULTELLUS VITREUS*, Dkr.

*Testa parvula, tenuissima, perfragilis, vitrea, substriata, recta, lineari-ovalis, utrinque æqualiter rotundata, epidermide tenerrima vestita. Cardo singularis; in valvula dextra denticuli observantur duo obliqui, paullo divergentes, valvula vero opposita tribus instructa est dentibus, mediano bifido. Ligamentum parvulum, brevissimum.*

Long. 18, alt. 6, lat. circiter 2 mm. æquat.

*Hab.* Singapore (*H. Cuming*).

19. *CULTELLUS CUMINGIANUS*, Dkr.

*Testa ovali-oblonga, subarcuata, utrinque rotundata, concentrice tenuiterque striata, sublævis, solidula, alba, maculis densis confluentibus fuscis, basin versus lividis picta, epidermide olivacea subrugosa induta.*

Long. 68, alt. 20, lat. 11 mm.

Differt a *Solene cultello* Linnæi testa solidiore, basi minus cur-

vata, extremitate postica latiore, haud attenuata, picturæ indole et epidermide haud lævigata.

*Hab.* Ad insulam Zebu Philippinarum (*H. Cuming*).

20. *CULTELLUS AUSTRALIS*, Dkr.

*Testa ovali-oblonga, subarcuata, utrinque rotundata, postice paululum latior, concentrice tenuiterque striata, solidula, alba, maculis pallidis subfuscis sparsis picta, epidermide olivacea subrugosa vestita.*

Long. 62, alt. 19, lat. 10 mm.

Hæc species a reliquis *Cultellis* pictis præsertim testa solidiore et pictura languida differt.

*Hab.* Ad Portum Essington, Australiæ (*Mr. Jukes*).

✓ 21. *CULTELLUS LIVIDUS*, Dkr.

*Testa ovali-oblonga, subarcuata, tenuissime striata, pæne lævis, utrinque rotundata, tenuis, nitida, pallide livida, maculis irregularibus obscurioribus variegata et nebulosa, epidermide tenerima, glabra, pellucida obducta.*

Specimen unicum quod exstat pæne 70 mm. longum, 19 altum, et 10 latum est.

Differt a *Solene cultello* Linnæi colore, testa ad umbones paullo convexiore, subcarinata, latere antico extrinsecus magis sinuato.

*Hab.* Ad Philippinas insulas (*H. Cuming*).

✓ 22. *CULTELLUS MARMORATUS*, Dkr.

*Testa ovali-oblonga, subarcuata, utrinque rotundata, fragilis, nitida, tenuissime striata, albida, subpellucida, colore sublivido marmorata, epidermide tenerrima diaphana vestita.*

Long. speciminis quod exstat unci 43, alt. 11, et lat. 6 mm. æquat.

Forma pæne eadem atque in *Cultello livido*, sed minor. Fortasse pullus est et varietas hujus speciei.

*Hab.* Ad insulam Negros Philippinarum (*H. Cuming*).

23. *CULTELLUS CONCINNUS*, Dkr.

*Testa parvula, ovali-oblonga, subarcuata, utrinque rotundata, postice latior, tenuis, albida, maculis lividis eleganter picta, radiisque albis duobus vel tribus oblitteratis ad lotus posticum decurrentibus signata, epidermide tenuissima, glabra, pellucida vestita.*

Long. 37, alt. 13, lat. 7 mm.

*Hab.* Ad insulam Negros Philippinarum (*H. Cuming*).

24. *PHARELLA OVALIS*, Dkr.

*Testa ovalis subelliptica, complanata, tenuis, lactea, lineis incrementi concentricis plus minusve expressis instructa, epidermide tenui, pallide cornea, languida, haud nitente, valvarum margines late excedente obducta; umbones obtusi, perparum prominentes, ad ¼*

*longitudinis testæ siti ; ligamentum breve, latiusculum ; cardo dentibus quinque munitus, in valva dextra duobus longis angustis divergentibus, antico subbifido, in valva opposita tribus, duobus posticis basi conjunctis.*

Long. 74, alt. 26, lat. 14 mm.

Inter omnes species, quæ ad hunc diem cognitæ sunt, hæc concha latissima vel potius altissima est ; forma ejus *Glaucnomen* in mentem vocat.

*Hab.* Singapore (*H. Cuming*).

## 25. MACHA SULCATA, Dkr.

*Testa ovali-oblonga, utrinque rotundata, postice paullo declivis, pallide fusca, subrosea, radiis duobus albis, postico paullulum latiore picta, sulcis crassis obliquis postice resupinatis et undulatis eleganter exsculpta, epidermide tenui, cornea, opaca vestita ; umbones obtusi ; venter paullo coarctatus.*

Hæc species magnitudine *Machæ strigilatæ* præ omnibus ceteris cognatis sulcis crassis, dorsi posticam partem versus undulatis insignis est.

*Hab.* In littore Australiæ orientalis (*Mr. Strange*).

## 26. MACHA PHILIPPINARUM, Dkr.

*Testa ovali-oblonga, utrinque rotundata, postice subdeclivis, pallide fusca, radiis duobus albis angustis signata, striis incrementi subtilibus sulcisque obliquis subimbricatis instructa, epidermide cornea decidua vestita ; umbones obtusi, parum prominentes, antemediani ; linea dorsi et basis subrectæ ; venter paullulum coarctatus.*

Long. 57, alt. 25, lat. 16 mm.

Species nostra *Machæ strigilatæ* simillima est, sed habitu minore, colore pallide fusco nec roseo, radiis angustioribus et margine posteriore subdeclivi facile distinguitur.

*Hab.* Ad Philippinarum insulas (*H. Cuming*).

## 27. MACHA AUSTRALIS, Dkr.

*Testa ovali-oblonga, antice rotundata, postice arcuato declivis, parum convexa, pallide subrosea, radiis duobus albis signata, dense tenuiterque sulcata, epidermide cornea decidua vestita ; venter parum coarctatus ; basis subsinuata ; umbones prominuli.*

Long. fere 60, alt. 26, lat. 16 mm.

Forma angustata, colore pallido sulcisque exilibus densis a speciebus præcedentibus discrepat.

*Hab.* — ? (*Mr. Strange*).

## 28. MACHA DESHAYESII, Dkr.

*Testa ovali-oblonga, utrinque rotundata, convexa, tota alba, epidermide tenui decidua obducta, striis incrementi obsoletis instructa, sulcis obliquis distantibus subimbricatis arata ; margo dorsi et basis subrecti, pæne paralleli ; umbones obtusi, haud prominentes, ad  $\frac{2}{5}$  longitudinis valvarum siti.*

Long. 60, alt. 25, lat. 16 mm.

Forma angusta, regularis, convexa. Loco radiorum, quibus ornantur *Macha strigilata* aliæque species, testa aliquantulum coarctata est. Cardinis structura *M. strigilatæ* plane respondet.

*Hab.* In littore Australiæ orientalis (*Mr. Strange*).

### 29. MACHA CUMINGIANA, Dkr.

*Testa ovali-oblonga, convexa, angusta, utrinque rotundata, alba, striis incrementi concentricis lineisque obliquis elevatis subtilibus instructa, epidermide sordida, tenui, decidua, sublamellosa induta; umbones parvuli, antemediani, obtusi; basis dorso subparallela.*

Long. 41, alt. 17, lat. 11 mm.

Hæc species *Machæ quoyi* Desh. similis est, sed statura angustiore, margine dorsi et basi fere parallelis, umbonibus obtusis vix prominentibus lineisque obliquis minoribus satis differt.

*Hab.* In Antillis insulis (*H. Cuming*).

### ✓ 30. AZOR OBLONGUS, Dkr.

*Testa ovali-oblonga, solida, alba, antice rotundata, postice producta, oblique subtruncata, concentricè rugoso-striata, epidermide cornea decidua vestita, canali lato ab umbonibus ad basin decurrente insignis; ligamentum crassum, prominens; umbones obtusi, ut solent, antemediani.*

Long. 73, alt. 31, lat. 17 mm.

Ab *Azore scheepmakeri* Dkr. testa angustiore, postice productiore necnon margine dorsi postico aliquantulum sinuato pro specie genuina differre videtur.

*Hab.* Ad insulam Luzon Philippinarum (*H. Cuming*).

### ✓ 31. AZOR SOLIDUS, Dkr.

*Testa ovali-oblonga, solida, alba, utrinque rotundata, in basi subarcuata, in dorso curvata, concentricè rugoso-striata, epidermide olivacea, decidua, margines versus lamellosa induta, canali obsoleto ab umbonibus obtusis decurrente instructa.*

Specimen quod exstat maximum 65 mm. longum, 31 altum, et 18 latum est.

Nescio an sit melius jungendus cum *Azore scheepmakeri*.

*Hab.* In insulis Philippinis (*H. Cuming*).

### 32. AZOR MINUTUS, Dkr.

*Testa minuta, ovali-oblonga, subelliptica, tenuis, lactea, subpellucida, concentricè tenerrimeque striata, epidermide pallide cornea obducta; sulcus ab umbonibus decurrens, vix conspicuus; altera valvula bidentata, altera unidentata, ita ut denticuli valvulæ dextræ erecti dentem parvulum valvæ oppositæ recipiant.*

Long. 17, alt. 8, lat. 4 mm.

Fortasse speciei cujusdam pullus est.

*Hab.* In insula Bureas Philippinarum (*H. Cuming*).

## 33. SILIQUARIA CARPENTERI, Dkr.

*Testa oblonga, linearis, recta, concentrice striata, livida vel olivacea, radiis duobus albidis in postica valvarum parte picta, linea brevi fusca ad umbones signata, epidermide cornea, in adultis speciminibus olivacea vestita; umbones submediani, parvuli, paullo porrecti; linea basis recta, margini dorsi subparallela; latus anticum rotundatum, posticum oblique rotundato-truncatum. Cardo valvula dextra denticulis duobus aequalibus, sinistra uno majore erecto cochleariformi et uno minore antico instructus. Sinus palliaris fere mediam testam occupat. Costula levis ab umbone directe decurrit.*

Long. 34, alt. 11, lat. 6 mm.

Differt a *Siliquaria polita* Carpenteri testa longiore angustiore, umbonibus paullo prominentibus, linea umbonum fusca directa neque obliqua.

*Hab.* In Carolina australi; Caraccas, West Colombia (*H. Cuming*).

## 34. SILIQUARIA NITIDISSIMA, Dkr.

*Testa oblonga, solidula, concentrice striata, alba, utrinque pallide livescens, linea brevi fusca ab umbonibus decurrente lineolisque nonnullis medias valvas tenentibus signata, epidermide tenui, pallide cornea, pellucida, constante et nitidissima obducta; umbones submediani, obtusi; basis et linea dorsi paullo curvata; extremitates rotundatae, postica subattenuata.*

Long. 43, alt. 15, lat. 7 mm.

Differt a *Siliquaria polita* Carp. testa majore solidiore, pictura languida, epidermide pallidior, et lineolis istis fuscis medias valvas occupantibus.

*Hab.* In littore Peruano (*H. Cuming*).

## 35. SILIQUARIA PERUANA, Dkr.

*Testa oblonga, ovalis, ventrosa, sordide alba, concentrice striata, epidermide cornea, glabra, nitida, utrinque subrugosa induta; extremitates rotundatae, postica angustior; ligamentum breve, crassum. Cardo in valva dextra bidentatus; dens posticus crassus, curvus; cardo valva opposita pariter dentibus duobus, sed minoribus et uno oblitterato munitus est. Præterea facies interna omnino Soleni gibbo respondet.*

Long. 53, alt. 23, lat. 17 mm.

Quæritur num hæc concha statura brevi, tumida, et extremitate antica æqualiter rotundata, necnon epidermide glabra excellens, pro specie propria haberi possit, an potius pro varietate curta *Siliquariæ gibbæ*, quæ mirum in modum variat.

*Hab.* In littore Peruano (*H. Cuming*).

## 36. AULUS JAPONICUS, Dkr.

*Testa ovalis, fere elliptica, compressiuscula, concentrice tenuiterque striata, lavigata, nitida, strigis vel zonis lividis et violacescentibus radiisque 4 albis picta, epidermide tenuissima subvitrea in-*







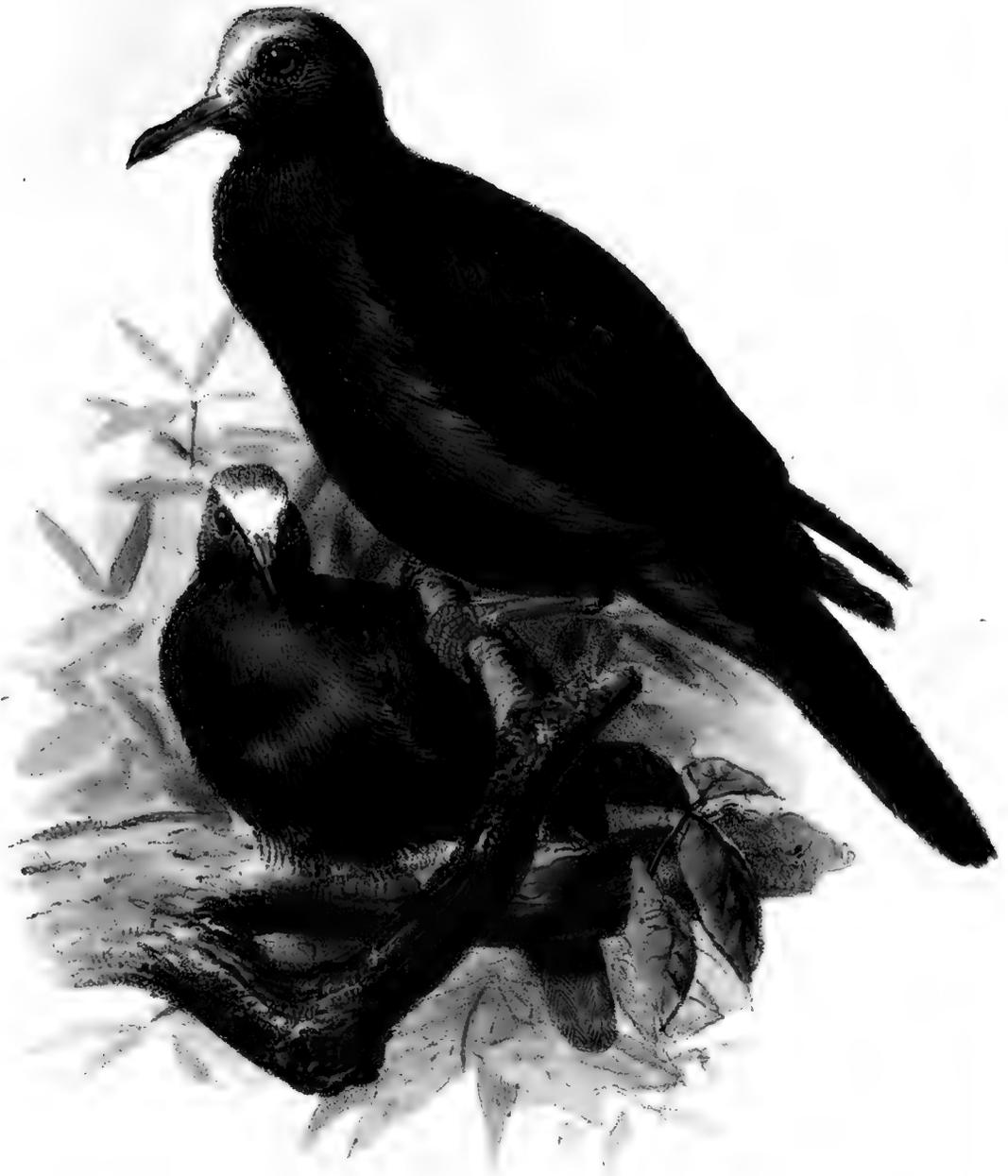


J Wolf, del et lith.

M. & N. Hanhart Imp

1. MACHÆRIRHYNCHUS ALBIFRONS.  
2. TODOPSIS WALLACII





*duta. Cardinis structura ut in Solene radiato; valva dextra dente unico cum adjacentibus duabus foveolis instructa, quibus dentes subconici duo valvæ oppositæ respondent; costa crassa, alba, parum obliqua, a cardine usque ad medium valvarum extenditur, marginem versus evanescens. Nymphæ magnæ, crassæ; ligamentum breve.*

Long. 50, alt. 24, lat. 11 mm.

Concha nostra statura minore, brevior, ambitu fere exacte elliptico, colore, necnon radio antico directo, haud obliquo, ab *Aulo radiato* satis differt.

*Hab.* In Japonia (*H. Cuming*).

### 37. AULUS GRAYANUS, Dkr.

*Testa ovali-oblonga, subelliptica, complanata, utrinque rotundata, ad basin subsinuata, striis concentricis distinctis instructa, nitida, pellucida, alba, radiis pallide lividis picta; umbones prominuli; costa angusta, elata, parum obliqua, extrinsecus diaphana, marginem versus evanescens.*

Long. 31, alt. 13, lat. 5 mm.

Differt ab *Aulo pulchro* Gouldii præsertim valvulis altioribus, striis concentricis distinctioribus, pictura languida. Sulcum parvum ad umbones incipientem ad latus posticum decurrentem, necnon strigillas minimas paullo divergentes sub vitro invenies.

### 38. AULUS ROSTRATUS, Dkr.

*Testa magna, ovali-oblonga, complanata, utrinque rotundata, antice brevis, postice longe producta, attenuata; basis æqualiter curvata; dorsum utrinque compressum, carinam acutam formans; ligamentum pro magnitudine testæ breve, paullo immersum; color cretaceus, opacus; epidermis crassa, coriacea, nitida; umbones prominuli, ad  $\frac{1}{2}$  longitudinis testæ siti, livido picti, radio albo obscuro utrinque signati.*

Long. 132, alt. 58, lat. 20 mm.

Species magna, forma sua rostrata ab *Aulo grandi* Hindsii differt.

*Hab.* In regionibus Arcticis (*H. Cuming*).

## 8. REMARKS ON, AND DESCRIPTIONS OF, NEW SPECIES OF BIRDS LATELY SENT BY MR. A. R. WALLACE FROM WAIGIOU, MYSOL, AND GAGIE ISLANDS. BY GEORGE ROBERT GRAY, F.L.S., &c.

(Plates XLII., XLIII., XLIV.)

The following new species, which I beg to lay before the Society, have been selected from a series of 73 species of Birds obtained at Waigiou, of which 10 species only had been previously noticed in works as from that locality, also from a series of 102 species procured at Mysol, which is quite a new locality for the ornithologist. There are further added some remarks on previously known species

which present differences in their colour, &c., according to the island that they inhabit.

**PODARGUS SUPERCILIARIS, G. R. Gr. (Pl. XLII.)**

This fine species differs from *Podargus marmoratus* in its deeper rufous colour on the upper surface, and in the white spots on the wings, and also in the numerous patches of white on the under surface of the body; but principally in the well-marked white eyebrows.

Total length 14" 3<sup>'''</sup>, bill from gape 2" 3<sup>'''</sup>, wings 7" 9<sup>'''</sup>.

*Hab.* Waigiou.

**HALCYON TOROTORO.**

Of this bird M. Lesson figured the male, from which the female differs in having a black crown and nuchal collar of the same colour. The Waigiou and Mysol examples vary from Lesson's figure in having the back and wings of a yellowish green, and the abdomen pale rufous instead of white.

**PTILOTIS SONOROIDES, G. R. Gr.**

This species approaches to *Ptilotis sonora*, Gould. It is of a brownish grey, with the lores and behind the eyes black; beneath the latter there is a bright yellow streak ending in a patch of pure white; beneath, the body is yellowish white, streaked with fuscous along the shaft of each feather; quills and tail bright olivaceous yellow on the outer margins.

Total length 8" 9<sup>'''</sup>, bill from gape 1" 1<sup>'''</sup>, wings 4" 6<sup>'''</sup>.

*Hab.* Waigiou.

**PTILOTIS SIMILIS, var.**

Differs from the typical *Ptilotis similis* in having the bill shorter, and the patch of yellow on the ear of a larger size.

*Hab.* Waigiou.

**PTILOTIS FLAVIVENTRIS.**

This species seems to vary in the different islands; for example, that of the Island of Waigiou is olivaceous above, with a greater quantity of yellow on the breast, and is also of a purplish brown on the sides of the abdomen and under tail-coverts, while the length of the wings is 3" 7<sup>'''</sup>.

That from Mysol has the sides of the abdomen and under tail-coverts inclined to rufous, while the wings are 4" 3<sup>'''</sup> in length.

**PTILOTIS MEGARHYNCHUS.**

The Mysol example agrees best in colour with the Dorey specimen, while the measurements are most like those of the Aru specimens. The bill is 1" 6 $\frac{1}{2}$ " in length.

The Waigiou specimens are of a dull brown, with grey on the head, neck, and breast. The bill is 1" 8<sup>'''</sup> in length, while in measurements it agrees best with the Dorey specimen.

**PTILOTIS POLYGRAMMA, G. R. Gr.**

Head greyish black; throat white; upper surface fuscous black, margined with olive yellow; feathers of nape, wing-coverts, and across the middle of the back speckled with triangular spots of white; quills and tail fuscous, margined with olive yellow; beneath the body white; the feathers of the breast fuscous along the shafts, while each feather of the abdomen has an irregular band of black; all are fringed with yellow.

Total length 6'' 6''', bill from gape 11''', wings 3'' 3'''.

*Hab.* Waigiou.

**TROPIDORHYNCHUS MARGINATUS, G. R. Gr.**

This species differs from the *Tropidorhynchus novæ guineæ* in having olivaceous margins to the quills. It seems also to be rather larger in all its dimensions.

*Hab.* Waigiou.

**MACHÆRIRHYNCHUS ALBIFRONS, G. R. Gr. (Pl. XLIII. fig. 1.)**

This bird is like the *M. xanthogenys*, G. R. Gr., in many respects; but it is at once distinguished by the front and streak over the eyes being white, and by the bill being rather narrower and slightly sharper in front.

The young bird is of a yellowish olivaceous, with the front and eyebrows pale rufous; throat and breast white, the latter is waved with fuscous; beneath, the rest of the body yellow, and olivaceous on the sides; wings and tail fuscous, with the coverts of the former margined with white, while the quills are margined with yellow.

Total length 4'' 11''', bill from gape 9½''', wings 2'' 4'''.

*Hab.* Waigiou and Mysol.

**TODOPSIS WALLACII, G. R. Gr. (Pl. XLIII. fig. 2.)**

Top of the head black, with the tips of the feathers light blue and the shaft bluish white; back rufous; wings and tail dark brown; wing-coverts tipped with white; round the eyes, lores, ear-coverts, and beneath the body white; quills margined narrowly with white; the tips of the outer tail-feathers also white.

Total length 4'' 7''', bill from gape 8''', wings 2''.

The young bird is rufous white on the throat; the bill is black, tipped with yellowish white; it differs from that of the typical *Todopsis* in being longer and somewhat curved, and in having the bristles as long as the bill.

*Hab.* Mysol.

**PACHYCEPHALA GRISEONOTA, G. R. Gr.**

Brownish grey above; quills and tail fuscous, margined with grey; beneath, the body white; breast tinged with brownish-white.

Total length 5'' 9''', bill from gape 9''', wings 3'' 2'''.

*Hab.* Mysol.

**CAMPEPHAGA SCHISTICEPS.**

The figure of this bird in the 'Voyage au Pôle Sud' represents

the female. The male is of a deep slaty grey, not unlike the *Campephaga tenuirostris* of Australia. The young male is of a pale rufous, changing to deep slaty grey.

**CAMPEPHAGA (LALAGE) ATROVIRENS, G. R. Gr.**

Greenish black; lower part of the back, body beneath, some of the wing-coverts, broadly tipped and margined, and the outer margins of secondaries and tertiaries, white; upper tail-coverts black, margined with white, and the tips of the outer tail-feathers white. Bill very small, and black; feet plumbeous.

Total length 8", bill from gape 8", wings 3" 11".

The young bird is fuscous black, the feathers of the under surface narrowly margined with fuscous black, under tail-coverts like those of the adult, but with less white on the lower part of the back.

*Hab.* Mysol.

**RECTES UROPYGIALIS, G. R. Gr.**

Its general appearance is similar to *Rectes dichrous*, but it is larger and of a darker rufous colour, with the lower part of the back as well as the tail-coverts deep black.

Total length 11", bill from gape 1" 3", wings 5".

*Hab.* Mysol.

**RECTES LEUCORHYNCHUS, G. R. Gr.**

It is above the size of *Rectes strepitans*, to which it is also very similar in colour, but it is easily distinguished by the colour of the bill, which is of a yellowish white.

Total length 12" 3", bill from gape 1" 4", wings 5" 11".

*Hab.* Gagie.

**RECTES CERVINIVENTRIS, G. R. Gr.**

This bird is nearest to *Rectes cirrocephalus*, but it is much smaller, and differs in the colour of the back, wings, and tail. Head and throat brownish grey; back the same colour, but darker; wings and tail brown, margined with rufous; abdomen and under tail-coverts rufous buff.

Total length 9" 5". bill from gape 1" 3", wings 3" 11".

*Hab.* Gagie.

**MYIOLESTES AFFINIS, G. R. Gr.**

It is like the *Myiolestes aruensis* on the upper surface, but the head has a slight tinge of grey; beneath, the body pale yellowish fuscous; throat slightly varied with white. It is rather smaller in its general measurements.

*Hab.* Gagie.

**CRATICUS PERSONATUS, var.**

The examples of Waigiou and Mysol have longer bills and a greater quantity of white on the tips of the outer tail-feathers. The New Guinean examples appear to be rather wider at the base of the culmen than in that part of the Aru, Waigiou, and Mysol specimens, but the length of the bill is about the same.

## PARADISEA RUBRA.

A specimen marked by Mr. Wallace as a male exhibits the cirrhi as extending for about three inches and a quarter beyond the tail-feathers, and ending in spatula-formed ends, composed of rather short and broad lateral webs. This peculiar character may denote it to be a young bird, of which as the bird advances in age the cirrhi prolong and the lateral webs at the ends wear off (see Wallace, 'Ibis,' 1861, p. 290).

It may here be remarked that a specimen with lengthened cirrhi and with long narrow-webbed ends was described as a distinct species under the name of *Paradisea bartlettii* by Mr. Goodwin in the 'Proceedings' of this Society, 1860, p. 243. The example referred to may now be considered as the young of *Paradisea papuana*.

## CALORNIS GULARIS, G. R. Gr.

-This species is very like the *Calornis viridescens*, but with less green on the nape; and it possesses the same rich glossy purple colour on the throat as is found on the breast.

Total length 8" 11<sup>'''</sup>, bill from gape 9 $\frac{1}{2}$ " 9<sup>'''</sup>.

*Hab.* Mysol.

## CALORNIS MYSOLENSIS, G. R. Gr.

It agrees in many respects with the *Calornis obscura*, but it is of a richer glossy green over the whole surface.

Total length 9" 2<sup>'''</sup>, bill from gape 11<sup>'''</sup>, wings 3" 9<sup>'''</sup>.

*Hab.* Mysol.

## CALORNIS CANTOROIDES, G. R. Gr.

*Lamprotornis cantor*, Müll.?

Black, with glossy green reflexions, as in the former species; but the tail is shorter, and nearly square at its end.

Total length 7" 5<sup>'''</sup>, bill from gape 11<sup>'''</sup>, wings 3" 8<sup>'''</sup>.

*Hab.* Mysol.

## EOS COCHINSINENSIS, var.

This variety differs in having an irregular collar of blue round the neck.

*Hab.* Waigiou.

## CHRYSOCOCCYX PÆCILURUS, G. R. Gr.

*Chrysococcyx lucidus*, auct.

The upper surface is like that of *C. lucidus*, but the inner webs of the tail-feathers (except the first and central feathers) are rufous, with broad black bands and white tips; the outer feather of each side is banded with white, rufous, and black, the black and white bands are the broadest; the inner margins of the quills rufous white. The glossy æneous bands on the under surface apparently more numerous and rather narrower than in *C. lucidus* of New Zealand.

*Hab.* Mysol.

The Australasian examples have the margins of the inner webs of the tail rufous, but the inner margins of the quills are always white.

**PTILONOPUS ROSEIPECTUS, G. R. Gr.**

Approaches the *P. viridis*, but is smaller and without the greyish white on the shoulder ; this colour is less extended on the face, where it is rather inclined to be of a bluish white. It has only a patch of deep rose-colour on the breast, which appears to be wanting in the female. The tips of the tail-feathers are without the bright-yellow margins.

Total length 7'' 6''', bill from gape 8''', wings 4'' 5'''.  
*Hab.* Waigiou, Gagie, and Mysol.

**HENICOPHAPS ALBIFRONS, G. R. Gr. (Pl. XLIV.)**

Front white ; fuscous-rufous black, tinged with glossy green, on the back and tertials ; greater wing-coverts with golden-coppery gloss ; abdomen grey fuscous ; under tail-coverts rufous.

Total length 13'' 6''', bill from gape 1'' 2½''', wings 7''.

The bill is like that of *Chalcophaps*, but the apical portion occupies rather more than half its length ; the basal part of culmen is flattened and rather broad.

*Hab.* Waigiou.

**MEGAPODIUS FREYCINETI.**

Mr. Wallace\* refers to what he considers to be two species of this genus, and states that their "bill and feet are different in size ;" but the variations referred to seem to me to be only caused by the difference of age.

**RALLUS PLUMBEIVENTRIS, G. R. Gr.**

Head, neck, and breast rufous ; back and wings olivaceous brown ; tail-coverts and tail black ; abdomen plumbeous.

Total length 11'' 3''', bill from gape 1'' 9''', wings 7'' 3'''.  
*Hab.* Mysol.

Mr. Wallace has thus increased the Avifauna of New Guinea and its neighbouring islands to upwards of three hundred species. Amongst these his diligence has added some sixty-five new species to our knowledge, many of which are not without interest to ornithological science.

A table of specific names is added to this paper, as it will best exemplify the distribution of the several species among the islands that constitute the localities of the New-Guinean Avifauna ; it will also distinguish those birds that at present appear to be peculiar to one island.

† in front of a specific name indicates those species, of the Waigiou and Mysol collections, of which this paper more especially treats.

\*\* before the name show the new species added to the New-Guinean avifauna by Mr. Wallace.

\* in column records those species of author's which have been given as inhabitants of the peculiar locality to which the column is dedicated.

\*\* in column point out the localities of those species of which Mr. Wallace had obtained specimens.

	New Guinea.	Louisiade.	Salwatty.	Battania.	Waigou.	Gagie.	Mysol.	Aru.	Ke.
† ** <i>Aquila gurneyi</i> , <i>G. R. Gr.</i> .....	**	..	..	..	**	..	..	..	..
<i>Cuncuma leucogaster</i> .....	*	*	..	..	..	..	..	**	..
<i>Haliastur leucosternus</i> .....	*	..	..	..	*	..	..	**	..
† * <i>Pandion leucocephalus</i> .....	..	*	..	..	..	..	**	..	..
** <i>Baza stenoazona</i> .....	**	..	..	..	..	..	..	**	..
† <i>Pernis (Henicopernis) longicauda</i> .....	*	..	..	..	**	..	**	..	..
<i>Astur novæ hollandiæ</i> .....	*	..	..	..	..	..	..	..	..
** <i>Accipiter poliocephalus</i> .....	**	..	..	..	..	..	..	..	..
† <i>    cruentus</i> .....	..	..	..	..	**	..	..	..	..
<i>Athene humeralis</i> .....	*	..	..	..	..	..	..	..	..
<i>theomacha</i> .....	*	..	..	..	..	..	..	..	..
<i>Podargus papuensis</i> .....	*	..	..	..	..	..	..	..	..
<i>ocellatus</i> .....	*	..	..	..	..	..	..	**	..
<i>marmoratus</i> .....	**	..	..	..	..	..	..	..	..
† ** <i>    superciliaris</i> , n. sp. ....	..	..	..	..	**	..	..	..	..
** <i>Ægotheles wallacei</i> .....	**	..	..	..	..	..	..	..	..
<i>Caprimulgus macrurus</i> .....	**	..	..	..	**	..	..	**	..
† <i>Macropteryx mystaceus</i> .....	*	..	..	..	..	..	**	**	..
† ** <i>Collocalia hypoleuca</i> .....	..	..	..	..	..	..	**	**	..
<i>nidifica</i> , var. ....	..	*	..	..	..	..	..	..	..
<i>Hirundo frontalis</i> .....	**	..	..	..	..	..	..	**	..
<i>nigricans</i> .....	..	..	..	..	..	..	..	**	..
<i>neoxena</i> .....	*	..	..	..	..	..	..	..	..
<i>Eurystomus gularis</i> (?) .....	*	..	..	..	..	..	..	..	..
† <i>    pacificus</i> .....	**	..	..	..	**	..	..	**	..
<i>Coracias temminckii</i> .....	*	..	..	..	..	..	..	..	..
<i>Peltops blainvillei</i> .....	*	..	..	..	..	..	..	..	..
? <i>Dacelo undulatus</i> .....	*	..	..	..	..	..	..	..	..
? <i>novæ guineæ</i> , ? <i>Sonn.</i> 107 .....	*	..	..	..	..	..	..	..	..
† <i>    gaudichaudi</i> .....	**	..	..	..	**	..	**	**	..
<i>macrorhynchus</i> .....	**	..	..	..	..	..	..	..	..
** <i>tyro</i> .....	..	..	..	..	..	..	..	**	..
† <i>Halcyon collaris</i> .....	..	..	..	..	..	**	**	**	..
† <i>    albicilla</i> .....	**	*	..	..	..	**	**	**	..
† <i>    sancta</i> .....	**	*	..	..	**	**	**	**	..
<i>cinnamomina</i> .....	*	..	..	..	..	..	..	..	..
<i>sordida</i> .....	..	*	..	..	..	..	..	**	..
† <i>Tanysiptera galatea</i> .....	**	..	..	..	**	..	..	..	..
** <i>hydrocharis</i> .....	..	..	..	..	..	..	..	**	..
<i>sylvia</i> .....	*?	..	..	..	..	..	..	..	..
† <i>Syma torotoro</i> .....	*	..	..	..	**	..	**	**	..
<i>Ceyx lepida</i> .....	*	..	..	..	..	..	..	..	..
<i>solitaria</i> .....	**	..	..	..	..	..	**	**	..
<i>pusilla</i> .....	**	..	..	..	..	..	**	**	..
<i>Alcyone azurea</i> , var. <i>lessoni</i> .....	**	..	..	..	..	..	..	**	..
† <i>Merops ornatus</i> .....	**	..	..	..	..	..	**	..	..
<i>Epimachus maximus</i> .....	**	..	..	..	*	..	..	..	..
<i>albus</i> .....	*	..	..	..	..	..	..	..	..
<i>magnificus</i> .....	*	..	..	..	..	..	..	..	..
† <i>Nectarinia aspasia</i> .....	**	..	..	..	**	..	**	**	..
<i>zenobia</i> .....	**	..	..	..	..	..	..	..	**
† <i>    frenata</i> .....	*	..	..	..	..	..	**	**	..
<i>amasia</i> .....	*	..	..	..	..	..	..	..	..
<i>eximia</i> .....	*	..	..	..	..	..	..	..	..
† <i>    eques</i> .....	**	..	..	..	**	..	**	..	..



	New Guinea.	Louisiade.	Salwatty.	Battanta.	Waigiou.	Gagie.	Mysol.	Aru.	Ke.
† ** Rhipidura atripennis .....	**	..	..	..	**	..	**	**	
Monarcha inornata .....	*	..	..	..	..	..	**	**	
† cinerascens .....	**	..	..	..	..	..	**	**	
† guttula .....	**	..	..	..	**	..	**	**	
** griseogularis .....	..	..	..	..	..	..	**	**	
** leucura .....	..	..	..	..	..	..	..	**	**
melanoptera .....	..	*	..	..	..	..	..	..	**
leucotis .....	..	*	..	..	..	..	..	..	**
** dichroa .....	**	..	..	..	..	..	..	..	**
† telescopthalma .....	**	..	..	..	**	..	**	**	
† chrysomela .....	**	..	..	..	**	..	**	**	
† ** Microeca flavovirescens .....	**	..	..	..	**	..	**	**	
** conspicillata .....	**	..	..	..	**	..	**	**	
† ** Pachycephala griseiceps .....	..	..	..	..	**	..	**	**	
† ** griseonota, n. sp. ....	..	..	..	..	..	..	**	**	
** rufipennis .....	..	..	..	..	..	..	..	**	**
** ? monacha .....	..	..	..	..	..	..	..	**	**
? lugubris .....	*	..	..	..	..	..	..	**	**
? virescens .....	*	..	..	..	..	..	..	**	**
spinicauda .....	*	..	..	..	..	..	..	**	**
Campephaga desgrazii .....	*	..	..	..	..	..	..	**	**
boyeri .....	*	..	..	..	..	..	..	**	**
** caruleogrisea .....	..	..	..	..	..	..	..	**	**
melanops, var. ....	..	*	..	..	..	..	..	**	**
hypoleuca .....	..	..	..	..	..	..	..	**	**
melæna .....	*	..	..	..	..	..	..	**	**
† plumbea .....	**	..	..	..	..	..	**	..	..
novæ-guinææ .....	*	..	..	..	..	..	..	..	..
papuensis .....	**	..	..	..	..	..	..	..	..
† schisticeps .....	*	..	..	..	..	..	**	..	..
† melanolora .....	..	..	..	..	..	..	**	..	..
larvata .....	*	..	..	..	..	..	..	..	..
† ** (Lalage) atrovirens, n. sp. ....	..	..	..	..	..	..	**	..	..
** (Lalage) polygrammica .....	..	..	..	..	..	..	**	..	..
† Artamus papuensis .....	*	..	..	..	..	..	**	**	**
** Dicrurus assimilis .....	**	..	..	..	..	..	**	**	**
** megalornis .....	..	..	..	..	..	..	**	**	**
megarhynchus .....	*	..	..	..	..	..	**	**	**
† carbonarius .....	*	..	..	..	**	..	**	..	**
Rectes cirrocephalus .....	**	..	..	..	..	..	..	..	..
dichrous .....	*	..	..	..	..	..	..	**	**
† ** uropygialis, n. sp. ....	..	..	..	..	..	..	**	**	**
† strepitans .....	**	..	..	..	..	..	**	**	**
† ** leucorhynchus, n. sp. ....	..	..	..	..	**	..	**	**	**
† ** cerviniventris, n. sp. ....	..	..	..	..	**	..	**	**	**
Myiolestes megarhynchus .....	**	..	..	..	..	..	**	**	**
† ** aruensis .....	..	..	..	..	..	..	**	**	**
† ** affinis, n. sp. ....	..	..	..	..	**	..	**	**	**
pulverulentus .....	*	..	..	..	..	..	..	..	..
Cracticus cassicus .....	*	..	..	..	..	..	..	..	..
personatus .....	**	..	..	..	..	..	..	**	**
—, var. ....	..	..	..	..	..	..	**	**	**
† quoyi .....	*	..	..	..	..	..	**	**	**
† Corvus orru .....	**	**	..	..	**	..	**	**	**
† Gymnocrvus senex (fuscicapillus, adlt.)	**	..	..	..	**	..	**	**	**

	New Guinea.	Louisaide.	Salwatty.	Battanta.	Waigiou.	Gagie.	Mysol.	Aru.	Ke.
Paradisea apoda .....	* ?	...	...	...	...	...	...	**	
† papuana. ( <i>P. bartlettii</i> , <i>Goodw.</i> juv. ♀) .....	**	...	...	...	*	...	**	**	
† regia.....	**	...	...	...	*	...	**	**	
† speciosa .....	* * *	...	...	...	*	...	**	**	
† atra .....	* * *	...	...	...	*	...	**	**	
† sexpennis.....	* * *	...	...	...	*	...	**	**	
† rubra .....	* * *	...	...	...	*	...	**	**	
?? wilsoni.....	* * *	...	...	...	*	...	**	**	
Astrapia nigra .....	*	...	...	...		...			
carunculata .....	*	...	...	...		...			
Ptilonorhynchus buccoides .....	*	...	...	...		...			
** melanotis.....	...	...	...	...	...	...	...	**	
† Manucodia viridis .....	*	...	...	...	**	...	**		
† atra .....	**	...	...	...	...	...	**		
† keraudrenii .....	**	...	...	...	...	...	**		
** Calornis viridescens ( <i>virescens errone-</i> <i>ously</i> ) .....	**	...	...	...	...	...	...	**	
† ** gularis, n. sp. ....	...	...	...	...	...	...	**		
† ** mysolensis, n. sp. ....	...	...	...	...	...	...	**		
† ** cantoroides, n. sp. ....	...	...	...	...	...	...	**		
† Gracula dumontii .....	**	...	...	...	**	...	**	**	
† Buceros ruficollis .....	**	...	...	...	**	...	**	**	
† Platycercus dorsalis .....	**	...	...	...	**	...	**	**	
† Apsomictus erythropterus, var. ....	*	...	...	...	*	...			
Chalcopsitta novæ guineæ .....	*	...	...	...		...			
† scintillata.....	*	...	...	...	...	...	...	*	
** rubrifrons .....	...	...	...	...	...	...	...	**	
** rubiginosa .....	...	...	...	...	**	...	...	**	
† atra .....	...	...	...	...	...	...	**	**	
† Chamosyna papua.....	*	...	...	...	*	...			
** pulchella .....	**	...	...	...	...	...			
† Lorius domicella .....	*	...	...	...	**	...	**		
† hypoinochrous .....	...	*	...	...	...	...	**		
† tricolor.....	**	...	...	...	**	...	**		
† puniceus .....	*	...	...	...	...	...	**		
† Eos squamata .....	*	...	...	...	...	...	**		
† cochinsinensis, var.....	...	...	...	...	*	...	**		
† fuscata .....	**	...	...	...	...	...	**		
† Eclectus linnæi .....	**	...	...	...	**	...	**	**	
† Psittacodis polychloros .....	*	...	...	...	...	...	**	**	*
† var. aruensis .....	...	...	...	...	**	...	**	**	*
† tarabe .....	...	...	...	...	...	...	**	**	*
† Coriphilus placentis .....	*	...	...	...	...	...	**	**	
† Trichoglossus cyanogrammus.....	*	...	...	...	...	...	**	**	
† capistratus, var. ....	*	...	...	...	...	...	**	**	
† **? nigrogularis .....	**	...	...	...	**	...	**	**	
** coccineifrons .....	...	...	...	...	...	...	**	**	
? ochrocephalus .....	*	...	...	...	...	...	**	**	
? immarginatus .....	*	...	...	...	...	...	**	**	
† Tanygnathus macrorhynchus.....	*	...	...	...	**	...	**	**	
? marginatus .....	*	...	...	...	...	...	**	**	
† Psittacus personatus (?).....	*	...	...	...	...	...	**	**	
† rhodops .....	...	...	...	...	**	...	**	**	
† pucherani.....	**	...	...	...	**	...	**	**	

	New Guinea.	Louisiade.	Salwaty.	Battanta.	Waigou.	Gagle.	Mysol.	Aru.	Ke.
** Psittacus capistratus .....	::	::	::	::	::	::	::	::	**
** aruensis .....	::	::	::	::	::	::	::	::	**
† Psittacula desmarestii.....	**	::	::	::	::	::	::	::	
† diophthalma .....	**	::	::	::	::	::	::	::	
Nasiterna pygmæa .....	**	::	::	::	::	::	::	::	
† Cacatua æquatorialis .....	**	::	::	::	::	::	::	::	
† triton .....	**	*	::	::	**	::	::	**	
† Microglossum aterrimum .....	**	::	::	::	*	::	::	**	
alecto .....	**	::	::	::	::	::	::	**	
Dasyptilus paraguanus .....	**	::	::	::	*	::	::	**	
pesquetii .....	**	::	::	::	::	::	::	**	
? Chrysocolaptes cardinalis .....	**	::	::	::	::	::	::	**	
† Centropus menebiki .....	**	::	::	::	::	::	**	**	
** spiopterus .....	**	::	::	::	::	::	**	**	
† Eudynamis punctatus.....	**	::	::	::	::	::	**	**	
Cuculus leucolophus .....	**	::	::	::	::	::	**	**	
† ** assimilis.....	**	::	::	::	**	::	**	**	
** megarhynchus.....	**	::	::	::	::	::	**	**	
Chrysococyx pœcilurus, n. sp. ....	*	::	::	::	::	::	**	**	
† Ptilonopus superbus (cyanovirens, Less. ♀) .....	**	::	::	::	**	::	**	**	
rivoli .....	**	::	::	::	**	::	**	**	
? strophium .....	*	*	::	::	::	::	**	**	
† ** prasinorrhous .....	**	::	::	::	**	::	**	**	**
perlatus .....	*	::	::	::	**	::	**	**	
** wallacei .....	**	::	::	::	**	::	**	**	
† pulchellus .....	**	::	::	::	**	::	**	**	
virens .....	*	::	::	::	**	::	**	**	
** aurantiifrons .....	**	::	::	::	**	::	**	**	
** coronulatus .....	**	::	::	::	**	::	**	**	
nanus .....	*	::	::	::	**	::	**	**	
** iozonus .....	**	::	::	::	**	::	**	**	
viridis (?) .....	*	::	::	::	**	::	**	**	
† ** roseipectus .....	**	::	::	::	**	**	**	**	
† Carpophaga pinon .....	**	::	::	::	**	**	**	**	
zoæ .....	**	::	::	::	**	**	**	**	
mülleri .....	**	::	::	::	**	**	**	**	
† bicolor .....	**	::	::	::	**	**	**	**	
** spilorrhœa .....	**	*	::	::	**	**	**	**	
chalybura.....	**	::	::	::	**	**	**	**	
† sundevallii .....	**	*	::	::	**	**	**	**	
pacifica (ænea, Auct.).....	*	::	::	::	**	**	**	**	
myristicivora .....	*	::	::	::	**	**	**	**	
† albogularis .....	**	*	::	::	**	**	**	**	
† rufigaster.....	**	::	::	::	**	**	**	**	
† puella .....	**	::	::	::	**	**	**	**	
leclancheri .....	*	::	::	::	**	**	**	**	
† perspicillata.....	**	::	::	::	**	**	**	**	
Macropygia phasianella .....	**	::	::	::	**	**	**	**	
† doreya .....	**	::	::	::	**	**	**	**	
† reinwardtii .....	*	::	::	::	**	**	**	**	
Geopelia humeralis.....	**	::	::	::	**	**	**	**	
† Chalcophaps stephani.....	**	::	::	::	**	**	**	**	
Trugon terrestris.....	*	::	::	::	**	**	**	**	
† ** Henicophaps albifrons, n. sp.....	**	::	::	::	**	**	**	**	**

	New Guinea.	Louisiade.	Salwatty.	Battanta.	Waigiou.	Gagie.	Mysol.	Aru.	Ke.
Calœnas nicobarica .....	..	*							
rufigula.....	**								
† Goura coronata .....	**	..	..	..	*				
victoriæ .....	**								
Talegallus cuvieri .....	**	..	..	..	..	..	..	**	
Megapodius reinwardtii .....	**	*	..	..	..	..	..	**	**
? rubripes .....	*								
† freycineti.....	*								
Coturnix novæ guineæ (Megapodius, j.?)	*	..	..	..	**	..	**		
Casuarus emu.....	*								
kaupi .....	..	..	X	..	..	..	..	**	
Esacus magnirostris .....	*	..	*						
Glareola grallaria .....	*	..	..		*	..	..	**	
Charadrius xanchocheilus .....	..	..	..	..	..	..	..	**	
† inornatus .....	*?	..	..	..	..	..	..	**	
Cinclus interpres.....	*	..	..	..	..	..	**	**	
Hæmatopus longirostris .....	X	..	..	..	..	..	..	**	
Ardea novæ guineæ .....	*	..	..	..	..	..	..	**	
jugularis .....	*?								
greyii .....	..								
aruensis .....	..	*							
Ardetta stagnatilis .....	*	..	..	..	..	..	..	**	
Botaurus heliosyla .....	**								
Numenius uropygialis.....	..								
† Tringoides empusa .....	*	..	..	..	..	..	..	**	
Himantopus leucocephalus.....	*	..	..	..	..	..	**	**	
Tringa albescens.....	*	..	..	..	..	..	..	**	
Phalaropus hyperboreus, var. ....	..							X	
† Scolopax — ? .....	..	..	..	..	..	..	..	**	
Parra gallinacea .....	*	..	..	..	..	..	..	**	
† ** Rallus plumbeiventris, n. sp. ....	**	..	..	..	..	..	X		
† ** Rallina tricolor .....	**	..	..	..	..	..	**	**	
oculea .....	..						**	**	
Eulabeornis castaneoventris .....	..	*						X	
Tadorna radjah .....	..	..	..	..	..	..	..	**	
? Eudypetes torquatus.....	*	..	..	..	..	..	..	**	
? papua .....	*							**	
? Aptenodytes longirostris (?) .....	*							**	
Halæbona typica .....	..				X				
† Sterna poliocerca .....	..	..	..	..	**	..	..	**	
torresii.....	..	..	..	..	..	..	**	**	
† gracilis .....	..	..	..	..	..	..	X	**	
melanauchen .....	*	..	..	..	..	..	**	**	
† paynana .....	..				X				
Sula fiber.....	..	..	..	..	..	..	**		
Graculus hypoleucus .....	..	..	..	..	..	..	..	..	**
Attagen ariel .....	*	*							

# INDEX.

- Ablabes**  
*collaris*, 216.  
*owenii*, 217.  
*punctatus*, 366.  
*rappii*, 216.
- Abroornis**  
*albigularis*, 200.  
*albiventris*, 199.  
*hodgsoni*, 199.  
*melanops*, 200.  
*superciliaris*, 200.
- Acanthogorgia**  
*grayi*, 296.  
*hirsuta*, 296.
- Acantholabrus**, 416.
- Acanthosaura**  
*armata*, 189.  
*capra*, 188.  
*coronata*, 187.
- Acanthylis**  
*collaris*, 79.
- Accipiter**  
*cruentus*, 433.  
*nisus*, 367, 368.  
*poliocephalus*, 433.
- Acephalocystis**  
*macaci*, 120.  
*ovis - tragelaphi*,  
 120.
- Achatina**  
*brevis*, 387.  
*foxcrofti*, 25.  
*octona*, 230.  
*planti*, 25.  
*semigranosa*, 25.
- Acrocladia**, 56.  
*trigonaria*, 58.
- Actinia**  
*mesembryanthemum*,  
 301.  
*virgata*, 301.
- Actodromas**  
*minuta*, 398.
- Adamsiella**  
*osberti*, 232.
- Addax**  
*nasomaculata*, 234.
- Adula**, 145.  
*multivalvis*, 145.
- Ægialitis**  
*melodus*, 80.
- Ægotheles**  
*wallacei*, 433.
- Agama**  
*versicolor*, 215.
- Ahætulla**  
*liocerca*, 325.
- Aiptasia**  
*couchii*, 300.
- Aix**  
*sponsa*, 44, 82, 84, 85.
- Alcedo**  
*ispida*, 264.
- Aleippe**  
*monacha*, 434.  
*murina*, 434.
- Alcyone**  
*azurea*, var. *lessoni*,  
 433.
- Alethelia**  
*urvillii*, 288.
- Alectura**  
*lathamii*, 288.
- Aletes**, 334, 336, 361.  
*centiquadrus*, 362.  
*centiquadrus*, var. *im-*  
*bricatus*, 154.  
*margaritarum*, 164.
- Alicia**, 303.  
*mirabilis*, 303.
- Alligator**  
*lucius*, 59, 367.
- Alora**  
*gou'dii*, 272.
- Ameria**  
*carinata*, 143.  
*cumingii*, 144.  
*mæsta*, 144.  
*obesa*, 144.  
*truncata*, 144.
- Amphis**  
*cedrorum*, 368.  
*cineracea*, 210.  
*garrula*, 368.
- Ampelis**  
*hypopyrrha*, 211.
- Anabates**  
*amaurotis*, 378.  
*atricapillus*, 378.  
*erythrocerus*, 378.  
*poliocephalus*, 378.  
*pyrrhodes*, 378.  
*ruficaudatus*, 378.  
*ruficollis*, 378.  
*striaticollis*, 378.  
*superciliaris*, 378.
- Anableps**  
*dowii*, 30.
- Anas**  
*acuta*, 84.  
*bimaculata*, 393.  
*boschas*, 84, 392.  
*cæruleata*, 84.  
*clangula*, 84.  
*clypeata*, 83, 84.  
*fusca*, 83.  
*glocitans*, 393.  
*marila*, 84.  
*mollissima*, 83.  
*nigra*, 83, 84.  
*perspicillata*, 83.  
*querquedula*, 84.  
*spectabilis*, 83.
- Andropadus**  
*importunus*, 396.
- Anguilla**  
*bengalensis*, 226.  
*elphinstonei*, 226.  
*porphyrea*, 226.  
*variegata*, 226.
- Anomalurus**  
*beccroftii*, 275.  
*beldeni*, 275.  
*berbianus*, 275.
- Anser**  
*albifrons*, 59, 365.  
*canadensis*, 368.  
*paludosus*, 19.  
*phænicopus*, 19, 234.  
*segetum*, 19.  
*sinensis*, 234.

- Anseranas**  
*melanoleuca*, 266.
- Anthea**  
*cereus*, 301.
- Anthus**  
*pratensis*, 367.  
*spinoletta*, 391.
- Antilope**  
*caama*, 307.  
*capreola*, 307.  
*euryceros*, 276.
- Aphantochroa**  
*roberti*, 203.
- Apogon**  
*dovi*, 371.
- Aprosmictus**  
*erythropterus*, 234, 365,  
 436.  
*scapulatus*, 234.
- Aptenodytes**  
*chrysocome*, 46.  
*longirostris*, 438.  
*pennantii*, 47.
- Aquila**  
*braccata*, 45.  
*fuscata*, 59, 101.  
*gurneyi*, 433.
- Ara**  
*severa*, 365.
- Arachnothera**  
*novæ guineæ*, 434.
- Aramides**  
*cayanensis*, 367.
- Aramus**  
*giganteus*, 81.  
*scolopaceus*, 81.
- Arca**  
*lactea*, 405.  
*noæ*, 405.
- Arctibeus**  
*achradophilus*, 64.  
*brachyotus*, 64.  
*carpolegus*, 64.  
*jamaicensis*, 64.  
*perspicillatus*, 64.  
*sulphureus*, 64.
- Ardea**  
*aruensis*, 438.  
*greyi*, 438.  
*herodias*, 81.  
*jugularis*, 438.  
*novæ guineæ*, 438.  
*purpurea*, 399.
- Ardetta**  
*exilis*, 81.  
*stagnatilis*, 438.
- Artamus**  
*papuensis*, 435.
- Ascaris**  
*depressa*, 122.  
*dispar*, 122.
- Ascaris**  
*lineata*, 123.  
*retusa*, 121.  
*tribothrioides*, 122.  
*vesicularis*, 122.
- Asteronyx**  
*loveni*, 96.
- Astrapia**  
*carunculata*, 436.  
*nigra*, 436.
- Astur**  
*monogrammicus*, 234,  
 365.  
*novæ hollandiæ*,  
 433.
- Ateles**  
*belzebuth*, 247.  
*paniscus*, 247.
- Athene**  
*humeralis*, 433.  
*theomacha*, 433.
- Atherina**  
*sikama*, 221.
- Attagen**  
*ariel*, 438.
- Attagis**  
*molouina*, 46.
- Auchenia**  
*glama*, 101.
- Aulia**  
*hypopyrrha*, 211.
- Aulus**  
*grayanus*, 427.  
*japonicus*, 426.  
*rostratus*, 427.
- Azor**  
*minutus*, 425.  
*oblongus*, 425.  
*solidus*, 425.
- Balaeniceps**, 131.
- Balea**  
*taylori*, 27.
- Barbus**  
*brachiatus*, 223.  
*diplocheilus*, 224.  
*hexastichus*, 224.  
*megalepis*, 223.  
*mosal*, 223.
- Basileuterus**  
*uropygialis*, 128.
- Basilornis**, 183.
- celebensis*, 184.  
*corythaix*, 184.
- Batagur**  
*dhongoka*, 214.  
*lineata*, 214.
- Batrachus**  
*surinamensis*, 369.
- Baza**  
*stenoazona*, 433.
- Beguina (Thecalia)**  
*concamerata*, 146.
- Belideus**, 368.
- Bernicla**  
*brenta*, 101, 365.  
*canadensis*, 264.
- Biblis**  
*leucocyma*, 53.
- Bilharzia**  
*magna*, 118.
- Bivonia**  
*albida*, 332.  
*contorta*, 344.  
*decussata*, 343.  
*glomerata*, 333.  
*subcancellata*, 355.
- Blacicus**  
*pallidus*, 77.
- Bleinnius**  
*brevipinnis*, 373.
- Boa**  
*constrictor*, 15, 115, 228.
- Boodon**  
*lineatus*, 209, 265.
- Bos**  
*grunniens*, 101.  
*taurus*, var. *domesticus*,  
 44.
- Botaurus**, 133.  
*heliosyla*, 438.
- Brachypteryx**, 201.  
*cruralis*, 201.  
*hyperythra*, 201.  
*nipalensis*, 201.  
*rufifrons*, 201.
- Bronchocelea**  
*cristatella*, 189.
- Bubo**  
*lacteus*, 59.  
*virginianus*, 367.
- Buccinum**  
*ambiguum*, 404.  
*nucleus*, 404.  
*olivaceum*, 404.  
*plumatum*, 404.
- Bucephalus**  
*capensis*, 209, 265.
- Buceros**  
*ruficollis*, 436.
- Bufo**  
*calamita*, 366.  
*carinatus*, 220.  
*melanostictus*, 189, 220.
- Bulimus**  
*arcolatus*, 194.  
*comes*, 193.  
*demerarensis*, 24.  
*dux*, 24.  
*dysoni*, 230.  
*felix*, 387.  
*flavus*, 194.

- Bulimus**  
*glaucolarynx*, 207.  
*gloriosus*, 387.  
*hepatostomus*, 23.  
*honduraticus*, 230.  
*inclinatus*, 387.  
*iodostylus*, 23.  
*moriciandi*, 230.  
*mouhoi*, 194.  
*niloticus*, 24.  
*pan*, 23.  
*pazianus*, 230.  
*portii*, 193.  
*pyrgiscus*, 24.  
*rhombostomus*, 194.  
*seemanni*, 207.  
*semipellucidus*, 230.  
*ventricosus*, 405.  
*zebrinus*, 194.
- Bulla**  
*media*, 405.  
*occidentalis*, 405.
- Bungarus**  
*fasciatus*, 391.
- Bunodes**  
*listeri*, 302.
- Burtinella**, 147.  
*contraria*, 148.  
*nodus*, 148.  
*nystii*, 148.  
*phillipsii*, 148.  
*sowerbii*, 148.  
*turbinata*, 148.
- Buteo**  
*erythronotus*, 45.  
*jacal*, 307.  
*poliosoma*, 45.  
*tricolor*, 45.  
*unicolor*, 45.  
*varius*, 45.  
*vulgaris*, 264.
- Cacatua**  
*æquatorialis*, 437.  
*cristata*, 365, 366.  
*philippinarum*, 234.  
*triton*, 437.
- Caccabis**  
*rufa*, 234.
- Cairina**  
*moschata*, 234.
- Calamaria**  
*brachyorrhos*, 216.  
*fusca*, 215.
- Callianassa**  
*turnerana*, 42.
- Callophis**  
*maccllellandii*, 219.  
*univirgatus*, 219.
- Calenas**, 234.  
*nicobarica*, 438.
- Calenas**  
*rufigula*, 438.
- Calornis**  
*cantoroides*, 431, 436.  
*gularis*, 431, 436.  
*nysolensis*, 431, 436.  
*viridescens*, 436.
- Calotes**  
*versicolor*, 189, 215.
- Calotragus**, 235, 268.  
*melanotis*, 209, 264.  
*tragulus*, 209, 264.
- Calyptrea**, 405.
- Campephaga**  
*atrovirens*, 435.  
*boyeri*, 435.  
*cæruleo-grisca*, 435.  
*desgrazii*, 435.  
*hypoleuca*, 435.  
*larvata*, 435.  
*melanolora*, 435.  
*melanops*, 435.  
*melena*, 435.  
*novæ guineæ*, 435.  
*papuensis*, 435.  
*plumbea*, 435.  
*polygrammica*, 435.  
*schisticeps*, 429, 435.
- Campulotus**, 334.
- Cancer**  
*bellianus*, 240.
- Canceroma**, 133.
- Canidia**, 384.  
*fusca*, 384.
- Canis**  
*lupus*, 368.
- Capra**  
*hircus*, 264.
- Caprimulgus**  
*americanus*, 77.  
*jamaicensis*, 77.  
*macrurus*, 433.
- Capromys**  
*brachyurus*, 64.
- Capsa**, 405.
- Cardium**  
*serratum*, 405.
- Carpophaga**  
*albogularis*, 437.  
*bicolor*, 437.  
*chalybura*, 437.  
*leclancheri*, 437.  
*mülleri*, 437.  
*myristicivora*, 437.  
*pacifica*, 437.  
*perspicillata*, 437.  
*pinon*, 437.  
*puella*, 437.  
*rufigaster*, 437.  
*sundevallii*, 437.  
*zoæ*, 437.
- Casarca**  
*rutila*, 59.
- Cassis**  
*testiculus*, 404.
- Castor**  
*canadensis*, 59.
- Casuarium**  
*emu*, 438.  
*kaupi*, 438.
- Catheturus**  
*australis*, 288.  
*cuvieri*, 288.  
*novæ hollandiæ*, 288.
- Catla**  
*buchanani*, 226.
- Cebus**, 250.  
*capucinus*, 59, 365.
- Cenchrus**  
*piscivorus*, 13.
- Centrolabrus**, 416.
- Centropus**  
*menebiki*, 437.  
*spilopterus*, 437.
- Centurus**  
*radiolatus*, 79.
- Cephalophus**  
*badius*, 366.  
*pygmaeus*, 209, 264.  
*rufilatus*, 367.
- Cercaria**  
*cercopitheci*, 119.  
*cervi*, 119.  
*macaci*, 119.
- Cercolabes**  
*novæ hispaniæ*, 288.
- Cercroleptes**  
*caudivolvulus*, 280.
- Cercopithecus**  
*delalandii*, 101, 234,  
366.  
*erxlebenii*, 274.  
*nigrripes*, 274.  
*ruber*, 101.  
*sabæus*, 234.
- Cereopsis**  
*novæ hollandiæ*, 234.
- Certhium**  
*alpicola*, 405.  
*eriense*, 405.  
*litratum*, 405.  
*mutabile*, 405.  
*peloritianum*, 405.
- Certhiola**  
*flaveola*, 73.  
*maritima*, 71.
- Cervulus**, 390.  
*cambojensis*, 138.
- Cervus**, 368.  
*aris*, 59, 264.  
*kuhii*, 138.  
*peronii*, 138.

- Cervus**  
*pseudaxis*, 235, 236.  
*sika*, 235, 236, 367.  
*taiouanus*, 235, 390.  
*wallichii*, 134, 236,  
 390.
- Ceryle**  
*alcyon*, 77.
- Cestoideum**  
*amadinae*, 120.
- Ceyx**  
*lepida*, 433.  
*pusilla*, 433.  
*solitaria*, 433.
- Chaca**  
*lophoides*, 223.
- Chætodon**  
*argus*, 221.  
*atromaculatus*, 221.  
*pairatalis*, 221.
- Chætura**  
*zonaris*, 79.
- Chalcophaps**  
*indica*, 365.  
*stephani*, 437.
- Chalcopsitta**  
*atra*, 436.  
*novæ guineæ*, 436.  
*rubrifrons*, 436.  
*rubiginosa*, 436.  
*scintillata*, 436.
- Chama**  
*iostoma*, 405.  
*macrophylla*, 405.
- Chamæleo**  
*africanus*, 234, 367.  
*dilepis*, 209, 265, 268.
- Chamæpelina**  
*passerina*, 80.  
*trochila*, 80.
- Charadrius**  
*inornatus*, 438.  
*xanthocheilus*, 438.
- Charmosyna**  
*papua*, 436.  
*pulchella*, 436.
- Chatoëssus**  
*manmina*, 226.
- Cheilinus**  
*hexatenia*, 409.
- Cheilio**, 410.
- Chelodina**  
*longicollis*, 59, 101.
- Chelonia**  
*imbricata*, 366.
- Chilonycteris**  
*fuliginosa*, 65.  
*grisea*, 65.  
*gymnonota*, 66.  
*macleayi*, 65.  
*osburni*, 66.
- Chilonycteris**  
*quadridens*, 65.  
*rubiginosa*, 66.
- Chiromys**  
*madagascariensis*, 306.
- Chiton**  
*squamosus*, 405.
- Chiura**  
*indica*, 215.
- Chloëphaga**  
*magellanica*, 367.  
*poliocephala*, 46.  
*rubidiceps*, 46.
- Chlorœnas**  
*inornata*, 80.  
*rufina*, 80.
- Chlorophanes**  
*flavirostris*, 129.  
*guatemalensis*, 129.
- Chlorosoma**  
*vernale*, 366.
- Chœrops**, 416.
- Chondropoma**  
*rubicundum*, 232.
- Chordeiles**  
*gundlachii*, 77.  
*minor*, 77.  
*pusillus*, 182.  
*virginianus*, 77.
- Chorisodon**  
*sibiricum*, 47, 50.
- Chrysococeyx**  
*pæcilura*, 431, 437.
- Chrysocolaptes**  
*cardinalis*, 437.
- Chrysomitris**  
*magellanica*, 46.
- Chrysopelea**  
*ornata*, 366.
- Chrysothrix**  
*sciureus*, 250.
- Chrysotis**  
*agilis*, 79.  
*collaria*, 79.
- Ciconia**  
*alba*, 101.
- Cidaris**, 54.
- Cinelodes**  
*vulgaris*, 47.
- Cinclus**  
*aquaticus*, 365.  
*interpres*, 438.
- Circus**  
*cyaneus*, 365.
- Cirrhilabrus**, 409.
- Cirrhina**  
*reba*, 225.
- Cistudo**  
*amboinensis*, 140.
- Cistula**  
*trochlearis*, 232.
- Clangula**  
*glaucon*, 234.
- Clausilia**  
*cambojensis*, 195.  
*obesa*, 27.  
*(Balea) taylori*, 27.
- Clea**  
*funesta*, 383.
- Clepticus**, 418.
- Clinus**  
*delalandii*, 369.  
*macrocephalus*, 373.
- Clupanodon**  
*manmina*, 226.
- Clypeaster**, 57.
- Cobitis**  
*barbatula*, 368.  
*scaturigina*, 225.
- Coccothraustes**  
*vulgaris*, 365.
- Coccyzus**  
*seniculus*, 79.
- Cœlogenys**  
*fulvus*, 288.  
*paca*, 288.
- Cœlopeltis**  
*vermiculata*, 49.
- Cœnurus**  
*lemuris*, 120.
- Collocalia**  
*hypoleuca*, 433.  
*nidifica*, 433.
- Coluber**  
*aulicus*, 219.  
*blumenbachii*, 218, 367.  
*dhumnades*, 219.  
*fasciolatus*, 218.  
*melanurus*, 218.  
*molurus*, 215.  
*naja*, 219.  
*nigro-marginatus*, 219.  
*quadrivittatus*, 13.  
*reticularis*, 218.  
*russellii*, 216.  
*stolatus*, 217.  
*trabatis*, 47.  
*umbratus*, 217.  
*(Elaphis) dione*, 48.
- Columbella**  
*concinna*, 404.  
*cribriaria*, 404.  
*mercatoria*, 404.  
*nitidula*, 404.  
*sandwichensis*, 244.
- Comatula**, 58.
- Conurus**  
*flaviventer*, 79.  
*nanus*, 79.
- Conus**  
*aurantius*, 404.  
*daucus*, 404.

- Conus**  
*mus*, 404.  
*nebulosus*, 404.  
*verrucosus*, 404.
- Copsychus**  
*albiventris*, 187.  
*amenus*, 186.  
*ceylonensis*, 186.  
*luzoniensis*, 186.  
*macrurus*, 187.  
*mindanensis*, 186.  
*pica*, 187.  
*pluto*, 186.  
*saularis*, 186.  
*stricklandi*, 187.  
*suavis*, 185.
- Copurus**  
*colonus*, 381.  
*filicauda*, 382.  
*funebri*, 382.  
*fuscicapillus*, 381.  
*leuconotus*, 382.  
*pæcilonotus*, 382.
- Coracias**  
*temminckii*, 433.
- Coridodax**, 418.
- Coriphilus**  
*placentis*, 436.
- Coris**, 411.
- Cornularia**  
*atlantica*, 298.
- Coronella**  
*albocincta*, 216.  
*cana*, 209, 265.  
*doliata*, 227.  
*puncticulata*, 216.
- Corvus**  
*orru*, 435.
- Coryphodon**  
*blumenbachii*, 218.  
*carinatus*, 219.  
*fasciolatus*, 218.  
*pantherinus*, 14, 323.
- Corythaix**  
*buffoni*, 59, 366.
- Corythus**  
*enucleator*, 366.
- Cosmetornis**  
*vevillaria*, 44.
- Cossyphodes**, 416.
- Cossyphus**, 416.
- Coturniculus**  
*tixicus*, 74.
- Coturnix**  
*coromandelica*, 365.  
*novæ guineæ*, 438.
- Cracticus**  
*cassicus*, 435.  
*personatus*, 430, 435.  
*quoyi*, 435.
- Craspedocephalus**  
*atrox*, 15, 114.  
*bilineatus*, 15, 114.  
*brasilienis*, 114.  
*lanceolatus*, 114.
- Crax**  
*alactor*, 365, 366.  
*carunculata*, 234.  
*globicera*, 234, 366.
- Cremnobates**, 374.  
*monophthalmus*, 374.
- Crenilabrus**, 417.
- Crex**  
*minuta*, 81.  
*porzana*, 367.
- Cricetomys**  
*gambianus*, 268.
- Crithagra**  
*brasilienis*, 74.
- Crocodylus**  
*biscutatus*, 140.  
*longirostris*, 215.  
*porosus*, 140.  
*tenuirostris*, 215.
- Crotalus**  
*horridus*, 15, 114, 229.
- Crotophaga**  
*ani*, 79.
- Cryptophthalmus**  
*cylindricus*, 245.
- Cryptoplax (Notoplax)**  
*speciosa*, 385.
- Ctenolabrus**, 417.
- Cuculus**  
*assimilis*, 437.  
*leucolophus*, 437.  
*megarhynchus*, 437.
- Cultellus**  
*attenuatus*, 422.  
*australis*, 423.  
*concinus*, 423.  
*cumingianus*, 422.  
*hanleyi*, 421.  
*lividus*, 423.  
*marmoratus*, 423.  
*politus*, 422.  
*subellipticus*, 421.  
*vitreus*, 422.
- Cuncuma**  
*leucogaster*, 433.
- Cuscus**, 314, 320.  
*chrysorrhos*, 317.  
*maculatus*, 318.  
*orientalis*, 320.  
*ornatus*, 320.  
*quoyii*, 320.  
 (Eucuscus) *brevicaudatus*, 316.  
 (Eucuscus) *ursinus*, 316.
- Cuscus**  
 (Strigocuscus) *celebensis*, 319.  
 (Spilocuscus) *chrysorrhos*, 317.  
 (Spilocuscus) *maculatus*, 318.
- Cyanopterus**  
*inornatus*, 82.
- Cyclographus**, 268.
- Cyclophorus**  
*papilio*, 29.  
*ponderosus*, 232.  
*translucidus*, 232.
- Cyclostoma**  
*isabella*, 388.  
*tahitensis*, 243.  
*viridescens*, 243.
- Cyclotus**  
*batchianensis*, 28.  
*natalensis*, 388.  
*subflammulatus*, 28.
- Cygnus**  
*olor*, 368.
- Cylindrella**  
*ghiesbreghtii*, 231.  
*microstoma*, 27.  
*salpinx*, 231.
- Cylindrophis**  
*rufa*, 189.
- Cymolutes**, 414.
- Cymospira**, 146.
- Cynocephalus**  
*porcarius*, 234.
- Cynogale**  
*velox*, 274.
- Cyphorhinus**  
*philomela*, 202.
- Cypræa**  
*cinerea*, 404.  
*rotunda*, 404.
- Cyprinus**  
*auratus*, 265.  
*catla*, 226.  
*gibelio*, 208.  
*mosal*, 223.  
*mosario*, 225.  
*reba*, 225.  
*richardsonii*, 224.
- Cysticercus**, 93.  
*phacochari-athiopici*, 121.  
*potamochæri-penicillati*, 121.  
*tenuicollis*, 121.
- Daboia**  
*elegans*, 266.
- Dacelo**  
*gaudichaudi*, 433.  
*gigas*, 365, 366.

- Dacelo**  
*macrorhynchus*, 433.  
*novæ guineæ*, 433.  
*tyro*, 433.  
*undulatus*, 433.
- Damalis**  
*albifrons*, 208, 264.
- Dasyprocta**  
*aguti*, 281, 368.  
*azaræ*, 287.  
*punctata*, 287.
- Dasyptilus**  
*paraguanus*, 437.  
*pesquetii*, 437.
- Dasypus**  
*minutus*, 287.
- Dasyurus**  
*maugæi*, 209, 265.  
*ursinus*, 366.
- Decodon**, 416.
- Delphinus**  
*micropterus*, 311.
- Dendrocopos**  
*rufus*, 378.
- Dendrocygna**  
*autumnalis*, 365.
- Dendroeca**  
*canadensis*, 70.  
*discolor*, 71.  
*palmarum*, 71.  
*pannosa*, 71.  
*petechia*, 71.  
*pharetra*, 71.  
*tigrina*, 71.
- Dendroma**  
*caniceps*, 378.  
*poliocephalum*, 378.
- Dendrophis**  
*picta*, 189.
- Dendropoma**  
*afrum*, 156.  
*centiquadra*, 154.  
*leucozonias*, 155.  
*lituella*, 154.  
*megamastum*, 153.  
*teredula*, 155.
- Dendrortyx**  
*leucophrys*, 234.
- Desmodus**  
*rufus*, 278.
- Diadema**, 56, 58.  
*diomea*, 51.  
*divona*, 50.
- Diagramma**  
*cinctum*, 221.
- Dicæum**  
*ignicolle*, 434.  
*papiense*, 434.  
*pectorale*, 434.
- Dicotyles**, 63.  
*torquatus*, 265, 287.
- Dicrurus**, 268.  
*assimilis*, 435.  
*carbonarius*, 435.  
*megalornis*, 435.  
*megarhynchus*, 435.
- Didelphys**  
*californica*, 287.  
*quica*, 287.
- Dilophyrus**  
*mentager*, 188.
- Diomedea**, 135.
- Diproctacanthus**, 415.  
*xanthurus*, 415.
- Dipsadomorphus**  
*biscutatus*, 228.
- Dipus**  
*jaculus*, 367.
- Distoma**  
*æquale*, 118.  
*boscii*, 119.  
*compactum*, 118.  
*conjunctum*, 118.  
*coronarium*, 119.  
*minutum*, 118.
- Dolabrifera**  
*tahitensis*, 245.
- Dolichonyx**  
*oryzivorus*, 74.
- Dolium**  
*perdix*, 404.
- Donacola**  
*castancothorax*, 198,  
 234.
- Doratonotus**, 413.
- Doriopsis**  
*viridis*, 244.
- Doris**  
*pulchra*, 247.
- Draco**  
*taniopterus*, 187.
- Dracunculus**  
*maculatus*, 189.
- Drusilla**  
*anableps*, 52.  
*artemis*, 52.  
*catops*, 52.  
*dioptica*, 52.  
*domitilla*, 51.  
*macrops*, 52.  
*mylæcha*, 52.  
*nyops*, 52.  
*phorcas*, 52.  
*selene*, 52.  
*urania*, 52.
- Dryiophis**  
*acuminata*, 14, 325.  
*argentea*, 14, 325.
- Duymæria**, 409.
- Dyctis**  
*agondas*, 53.  
*bioculatus*, 53.
- Dysopsis**  
*limbatus*, 40.
- Eccyliomphalus**, 175.
- Echinococcus**  
*altricipariens*, 120.
- Echinometra**, 56.
- Echinorhynchus**  
*inflexus*, 124.
- Echinus**, 54.  
*flemingii*, 54.  
*sphæra*, 58.
- Ecletus**  
*linnæi*, 436.
- Egretta**  
*alba*, 398.  
*cærulea*, 81.  
*nigrirostris*, 399.  
*nivea*, 81.
- Elainea**  
*albiceps*, 406.  
*caniceps*, 407.  
*cotta*, 76, 408.  
*fallax*, 76, 407.  
*griseigularis*, 407.  
*implacens*, 408.  
*mesoleuca*, 407.  
*modesta*, 407.  
*olivacea*, 408.  
*pagana*, 406.  
*palatangæ*, 407.  
*placens*, 407.  
*riisii*, 406.  
*rustica*, 408.  
*semipagana*, 406.  
*subpagana*, 406.  
*subplacens*, 407.
- Elaphis**  
*dione*, 391.
- Elapochrus**  
*deppci*, 228.
- Elapomorphus**  
*scalaris*, 325.  
*wuchereri*, 15.
- Elaps**  
*corallinus*, 15, 228.  
*lemniscatus*, 15.  
*macolellandii*, 219.  
*octolineatus*, 216.  
*univirgatus*, 219.
- Emarginula**, 405.
- Emberiza**  
*hortulana*, 367.
- Embernagra**  
*chloronota*, 202.
- Empagusia**  
*flavescens*, 215.
- Emys**  
*crassicollis*, 140.  
*dhongoka*, 214.  
*lineata*, 214.

- Emys**  
*venusta*, 229.  
**Ensis**  
*luzonicus*, 421.  
**Entomophilus**  
*albigularis*, 434.  
*spilodera*, 434.  
**Eos**  
*cochinchinensis*, 431,  
 436.  
*fuscata*, 436.  
*squamata*, 436.  
**Ephialetes**  
*grammicus*, 80.  
**Epibulus**, 409.  
**Epicrates**  
*cenchræa*, 15, 115.  
**Epidromus**  
*cumingi*, 205.  
**Epimachus**  
*albus*, 433.  
*magnificus*, 433.  
*maximus*, 433.  
**Epomophorus**  
*crypturus*, 11.  
*franqueti*, 11.  
*gambianus*, 11.  
*labiatus*, 11.  
*macrocephalus*, 11.  
*schoensis*, 12.  
**Epthianura**  
*tricolor*, 209.  
**Equus**  
*burchelli*, 209, 264.  
**Eremias**  
*variabilis*, 50.  
*velox*, 50.  
**Erethizon**  
*dorsatum*, 101.  
**Erinaceus**  
*collaris*, 390.  
**Erismatura**, 268.  
**Erodias**  
*victoriæ*, 399.  
**Erythrolamprus**  
*venustissimus*, 322.  
**Esacus**  
*maguirostris*, 438.  
**Estrela**  
*bichenovii*, 198, 234,  
 365.  
*phaëton*, 198, 234,  
 365.  
*ruficauda*, 198, 234.  
**Euctenogobius**  
*sagittula*, 372.  
**Eudynamis**  
*punctatus*, 437.  
**Eudyptes**  
*antarcticus*, 47.  
*chrysocome*, 47.
- Eudyptes**  
*chrysolophus*, 47.  
*diadematus*, 46.  
*nigrivestis*, 46.  
*papua*, 438.  
*torquatus*, 438.  
**Eulabeornis**  
*castaneoventris*, 438.  
**Eunectes**  
*murinus*, 15, 59, 115.  
**Eupetes**  
*ajax*, 434.  
*cærulescens*, 434.  
**Euphonia**  
*jamaica*, 73.  
*vittata*, 129.  
*helias*, 367.  
**Eurypyga**, 133.  
**Eurystomus**  
*gularis*, 433.  
*pacificus*, 433.  
**Eustrongylus**  
*papillosus*, 121.  
**Falco**  
*azalon*, 368.  
*anatum*, 101.  
*peregrinus*, 366.  
*poliosoma*, 45.  
*subbuteo*, 367.  
**Felis**  
*concolor*, 141.  
*hernandezii*, 141.  
*jubata*, 141.  
*leo*, 140.  
*leopardus*, 140.  
*mitis*, 280.  
*onca*, 140, 141.  
*pardalis*, 141, 264.  
*tigris*, 140.  
*yagouarondi*, 287.  
**Fiber**  
*zibethicus*, 368.  
**Filaria**  
*ardeæ-nycticoracis*,  
 123.  
*colubri-americanæ*, 123.  
*colubri-blumenbachii*,  
 123.  
*gruis-antigones*, 124.  
*lacertarum*, 124.  
*sanguinea*, 208.  
**Fissurella**  
*barbadensis*, 405.  
*cayennensis*, 405.  
*granifera*, 244.  
*græca*, 405.  
*listeri*, 405.  
*minuta*, 405.  
**Fistularia**  
*tabaccaria*, 369.
- Florida**  
*cærulea*, 81.  
**Fulica**, 46.  
*americana*, 81.  
**Fuligula**  
*ferina*, 44, 82, 84.  
*marila*, 234.  
*nyroca*, 44, 82, 84.  
**Furcella**, 313.  
**Galago**  
*crassicaudatus*, 274.  
**Galaxias**  
*scriba*, 101, 207, 439.  
**Gallinago**  
*wilsonii*, 80.  
**Gallinula**  
*chloropus*, 18, 261.  
*galeata*, 18, 81.  
*nesiotis*, 209, 261.  
*pyrrhorrhoa*, 19.  
*tenebrosa*, 18.  
**Gallophasis**  
*horsfieldii*, 59.  
**Gallus**  
*domesticus*, 102, 368.  
**Gambetta**  
*melanoleuca*, 80.  
**Garzetta**  
*candidissima*, 81.  
**Gasterosteus**  
*ovatus*, 222.  
**Gavialis**  
*gangeticus*, 215.  
**Gazella**  
*dorcas*, 234.  
**Gecko**  
*verus*, 189.  
**Genetta**  
*abyssinica*, 366.  
*feldiana*, 274.  
*pardina*, 274.  
**Geoclemmys**  
*macrocephala*, 139.  
*melanosterna*, 205.  
**Geomyda**  
*spinosa*, 139.  
**Geopelia**  
*humeralis*, 437.  
**Geophis**  
*güntheri*, 115.  
**Geopsittacus**  
*occidentalis*, 100.  
**Geothlypis**  
*trichas*, 70.  
**Geotrygon**  
*montana*, 80.  
**Gerres**  
*longirostris*, 142.  
**Gerygone**  
*chrysoaster*, 434.

- Glandina**  
*carminensis*, 230.  
*ghiesbreghti*, 230.
- Glareola**  
*grallaria*, 438.
- Globiocephalus**  
*incrassatus*, 309.  
*svineval*, 309.
- Glossiptila**  
*ruficollis*, 73.
- Glossophaga**, 87.  
*amplexicaudata*, 88.  
*caudifer*, 64, 91.  
*ecaudata*, 88.  
*leachi*, 278.
- Glyciphila**  
*modesta*, 435.  
*ocularis*, 434.
- Gobio**  
*ricnorhynchus*, 225.
- Gobius**  
*giuris*, 222.  
*paradoxus*, 372.  
*seminudus*, 372.
- Gomphosus**, 410.
- Gonodactylus**  
*guerini*, 43.
- Gonorhynchus**  
*gobioides*, 225.
- Goura**  
*coronata*, 438.  
*victoriae*, 438.
- Gracula**  
*dumontii*, 436.  
*sularis*, 186.
- Graculus**  
*hypoleucus*, 438.
- Grallaria**  
*guatemalensis*, 381.  
*imperator*, 381.  
*mexicana*, 381.  
*regulus*, 381.  
*varia*, 381.
- Grissonia**  
*vittata*, 59.
- Grus**  
*carunculata*, 209,  
 265.  
*montignesia*, 369.  
*paradisea*, 307, 439.
- Gryllivora**  
*brevirostris*, 186.  
*intermedia*, 186.  
*longicauda*, 187.  
*rosea*, 186.
- Güntheria**, 413.  
*cæruleovittata*, 413.
- Gurnellus**, 239.
- Gymnocorvus**  
*senex*, 436.  
*fuscicapillus*, 435.
- Gymnorhina**  
*tibicen*, 183.
- Hæmatopus**  
*longirostris*, 438.
- Halæbona**  
*typica*, 438.
- Halcyon**  
*albicilla*, 433.  
*cinnamomina*, 433.  
*collaris*, 433.  
*sancta*, 433.  
*sordida*, 433.  
*torotoro*, 428.
- Haliaëtus**  
*leucocephalus*, 367.
- Haliastur**  
*indus*, 367.  
*leucosternus*, 433.
- Halichoeres**, 371, 412.  
*cæruleovittatus*, 413.  
*variegatus*, 411.
- Halmaturus**, 234.
- Hapale**  
*iacchus*, 366, 367, 368.  
*adipus*, 264.
- Heleotragus**  
*capreolus*, 209, 264.
- Helicina**  
*amæna*, 233.  
*chryseis*, 233.  
*lindeni*, 233.  
*merdigeræ*, 233.  
*salvini*, 233.  
*variabilis*, 405.
- Helicops**  
*angulatus*, 114.  
*leprieurii*, 114.
- Helisoma**  
*lautus*, 145.
- Helix**  
*acetabulum*, 242.  
*ajax*, 191.  
*andromache*, 191.  
*atacta*, 386.  
*atropusca*, 22.  
*batchianensis*, 21.  
*bermudensis*, 405.  
*cæsia*, 20.  
*calypso*, 386.  
*carmeliensis*, 21.  
*ceramensis*, 192.  
*circumfirmatus*, 405.  
*coactiliata*, 230.  
*conula*, 243.  
*erinaceus*, 192.  
*eurgomphala*, 230.  
*euterpe*, 193.  
*eximia*, 230.  
*expansa*, 22.  
*faradensis*, 20.
- Helix**  
*gassiesi*, 21.  
*ghiesbreghti*, 230.  
*grossularia*, 192.  
*guinaria*, 195.  
*hector*, 191.  
*ignescens*, 20.  
*lactiflua*, 190.  
*lalliana*, 230.  
*lanceolata*, 386.  
*leucothoë*, 192.  
*leucotropis*, 22.  
*martensi*, 193.  
*microdonta*, 405.  
*neptunus*, 190.  
*nodifera*, 21.  
*occulta*, 22.  
*paludosus*, 405.  
*parvidens*, 243.  
*pernobilis*, 190.  
*phryne*, 386.  
*polillensis*, 190.  
*portii*, 191.  
*repanda*, 195.  
*rhynchostoma*, 21.  
*subcornæa*, 20.  
*trochiscus*, 20.  
*uranus*, 190.  
*xanthochila*, 192.
- Helogale**, 308.  
*parula*, 308.  
*tanionota*, 308.
- Hemicoris**, 411.  
*variegata*, 411.
- Hemidactylus**  
*frenatus*, 189.
- Hemiderma**, 104.
- Hemigymnus**, 413.
- Hemipteronotus**, 414.  
*quinquemaculatus*, 414.
- Hemitautoga**, 413.  
*centiquadra*, 413.
- Henicichla**  
*auricapilla*, 70.  
*ludoviciana*, 70.  
*noyboracensis*, 70.
- Henicophaps**  
*albifrons*, 432, 437.
- Herodias**  
*egretta*, 80.
- Herpestes**  
*griseus*, 264, 367.  
*parvulus*, 308.  
*rutilus*, 136.  
*tanionotus*, 308.
- Herpetodryas**  
*carinatus*, 14, 324.  
*fuscus*, 14.
- Hesperomys**, 284.  
*(Myoxomys) salvini*,  
 285.

- Heterornis**  
*corythax*, 184.  
**Hiaticula**, 268.  
**Hieracidea**  
*berigora*, 366.  
**Himantopus**  
*leucocephalus*, 438.  
**Hippotragus**  
*niger*, 367.  
**Hirundo**  
*frontalis*, 433.  
*fulva*, 72.  
*lunifrons*, 72.  
*neoxena*, 433.  
*nigricans*, 433.  
*pæciloma*, 72.  
**Holocentrus**  
*servus*, 221.  
**Hologymnosus**, 410.  
*fasciatus*, 410.  
**Homalocranium**  
*atrocinctum*, 227.  
**Homalopsis**  
*buccata*, 189.  
**Hoplocephalus**  
*superbus*, 368.  
**Hoplopterus**  
*cayanus*, 46.  
**Houbara**  
*macqueeni*, 397.  
*undulata*, 398.  
**Hyla**  
*holochlora*, 229.  
*leucomystax*, 220.  
*maculata*, 220.  
**Hylobates**  
*agilis*, 212.  
*pilatus*, 136.  
**Hylocharis**, 435.  
**Hylophilus**  
*insularis*, 128.  
**Hyperoodon**  
*latifrons*, 313.  
*rostratum*, 313.  
**Hypotriorchis**  
*columbarius*, 79.  
**Hypsigenys**, 416.  
**Hypuroptila**  
*isauræ*, 199.  
*urochrysa*, 198.  
**Hyrax**  
*capensis*, 101, 209, 234,  
 264.  
**Hystrix**  
*novæ-hispaniæ*, 288.  
**Ichnoglossa**, 91.  
**Icterus**  
*leucopteryx*, 74.  
*personatus*, 74.  
**Iguana**, 60, 61.
- Imperator**  
*chemnitzii*, 405.  
**Ischnognathus**  
*dekayi*, 228.  
**Ixulus**  
*castaneiceps*, 202.  
*striatus*, 202.  
**Janthina**  
*fragilis*, 405.  
**Julidina**, 408, 410, 414,  
 415, 418.  
**Julis**, 410.  
*geoffroyi*, 412.  
*girardi*, 412.  
*lineolatus*, 413.  
 (Halichæres) *annularis*,  
 411.  
 (Halichæres) *cyano-*  
*pleura*, 412.  
 (Halichæres) *hetero-*  
*pterus*, 411.  
**Kerivoula**  
*ærosa*, 32.  
*argentata*, 32.  
*lanosa*, 32.  
*papillosa*, 32.  
**Kittacincla**  
*albiventris*, 187.  
*macrura*, 187.  
**Labeobarbus**  
*hexastichus*, 224.  
**Labrichthys**, 415.  
*cyanotenia*, 415.  
**Labroides**, 415.  
*paradiseus*, 415.  
**Labrus**, 417.  
*centiquadrus*, 413.  
*rubiginosus*, 413.  
*tæniurus*, 414.  
**Lacerta**  
*gangetica*, 215.  
*rufescens*, 215.  
**Lachesis**  
*mutus*, 15, 114,  
 322.  
**Lachnolaimus**, 417.  
**Laletes**, 72.  
*osburni*, 72.  
**Lampornis**  
*mango*, 79.  
*porphyryra*, 79.  
**Lamprophis**  
*aurora*, 209, 265.  
**Lampropsar**  
*guianensis*, 74.  
**Lanius**  
*excubitor*, 365.  
*niger*, 77.
- Larus**  
*argentatus*, 368.  
*marinus*, 365.  
**Lasiurus**  
*novæboracensis*, 69.  
**Lathria**  
*cinerea*, 210.  
*fusco-cinerea*, 210.  
**Lathriosoma**  
*typicum*, 211.  
**Leda**  
*dohrni*, 242.  
**Leiolepis**  
*bellii*, 189.  
**Leiothrix**  
*cinerea*, 202.  
**Leipoa**  
*ocellata*, 288.  
**Leiuranus**, 226.  
**Lemur**  
*catta*, 249.  
**Leopardus**  
*viverrinus*, 136.  
**Leptasthenura**  
*paranensis*, 377.  
**Leptinaria**  
*elisæ*, 231.  
*emmelinæ*, 231.  
**Leptodeira**  
*annulata*, 15.  
*rufescens*, 209, 265.  
**Leptognathus**  
*catesbyi*, 15.  
**Leptojuhis**, 412.  
*cyanopleura*, 412.  
**Leptoplus**  
*trifrenatus*, 219.  
**Leptopoma**  
*cinctellum*, 388.  
*decipiens*, 29.  
*globulosum*, 29.  
*menadense*, 389.  
*moukoti*, 195.  
*nigricans*, 388.  
*pulicarium*, 29.  
**Lepus**  
*douglasii*, 281.  
*nigripes*, 40.  
*palustris*, 281.  
*sinensis*, 390.  
*timidus*, 366, 367.  
*variabilis*, 366.  
**Lernæa**  
*cyclopteryna*, 239.  
**Lestris**  
*pomerinus*, 401.  
**Leuciscus**  
*brachiatus*, 223.  
*erythrophthalmus*,  
 208.  
*rutilus*, 208.

- Ligula**  
*colubri-blumenbachii*, 120.
- Lima**  
*scabra*, 405.  
*tenera*, 405.
- Limicolaria**  
*turris*, 25.
- Linota**  
*canescens*, 368.  
*cannabina*, 59.  
*montium*, 59.
- Liophis**  
*cobella*, 14, 322.  
*conirostris*, 14, 322.  
*merremii*, 14, 322.  
*reginae*, 14, 322.
- Lipaugus**  
*cineracens*, 210.  
*fuscocinereus*, 210.  
*holerythrus*, 211.  
*hypopyrrhus*, 211.  
*plumbeus*, 210.  
*rufescens*, 211.  
*simplex*, 211.  
*subalaris*, 210, 211.  
*unirufus*, 211, 212.
- Littorina**  
*angulifera*, 405.  
*dilatata*, 405.  
*muricata*, 405.  
*ziczac*, 405.
- Lobiger**, 246.
- Lobocheilus**  
*gobioides*, 225.  
*ricnorhynchus*, 225.
- Lobostoma**  
*quadridentis*, 65.
- Lophocercus**  
*viridis*, 246.
- Lophostoma**, 105.  
*sylicolum*, 104, 106, 108.
- Lorius**  
*domicella*, 436.  
*hypoinochrous*, 436.  
*punicus*, 436.  
*tricolor*, 436.
- Loxigilla**  
*anoxantha*, 74.  
*violacea*, 74.
- Lucina**  
*muricata*, 405.  
*pecten*, 405.  
*pennsylvanica*, 405.  
*squamosa*, 405.  
*tigrina*, 405.
- Luscinia**  
*philomela*, 264, 368.
- Lutra**  
*californica*, 280.
- Lutra**  
*chilensis*, 279.  
*nair*, 390.  
*platensis*, 280.  
*vulgaris*, 101.
- Lycodon**  
*aulicus*, 219.  
*hebe*, 219.
- Macacus**  
*cynomolgus*, 59, 101, 365, 366, 439.  
*nemestrinus*, 209, 265, 368.  
*pileatus*, 367, 368.  
*radiatus*, 59.  
*rhesus*, 101, 234, 365, 366, 367, 368.
- Macha**  
*australis*, 424.  
*cumingiana*, 425.  
*deshayesii*, 424.  
*philippinarum*, 424.  
*sulcata*, 424.
- Machæirhynchus**  
*albifrons*, 429, 434.  
*xanthogenys*, 434.
- Macroceramus**  
*polystreptus*, 233.
- Macrognathus**  
*armatus*, 222.
- Macropharyngodon**, 412.  
*geoffroyi*, 412.
- Macrophragma**, 359.
- Macropteryx**  
*mystaccus*, 433.
- Macropus**  
*gigas*, 234.
- Macropygia**  
*doreya*, 437.  
*phasianella*, 437.  
*reinwardtii*, 437.
- Macrootis**  
*waterhousii*, 65.
- Malapterus**, 417.
- Manatus**  
*latirostris*, 277.  
*owenii*, 277.  
*senegalensis*, 277.  
*vogelii*, 277.
- Mangelia**, 404.
- Manis**  
*pentadactyla*, 139.
- Manucodia**  
*atra*, 436.  
*keraudrenii*, 436.  
*viridis*, 436.
- Mareca**  
*penelope*, 392.
- Marginella**  
*avena*, 404.
- Marginella**  
*pallida*, 404.  
*varia*, 404.
- Mastacembelus**  
*armatus*, 222.
- Megacephalon**  
*rubripes*, 288.  
*maleo*, 288.
- Megalomastoma**  
*simulacrum*, 232.
- Megapodius**  
*andersoni*, 291.  
*burnabyi*, 290.  
*cumingii*, 290.  
*duperreyii*, 290.  
*forsteri*, 289.  
*freycineti*, 288, 432, 438.  
*gilbertii*, 289.  
*gouldii*, 290.  
*la-perousi*, 289.  
*macgillivrayi*, 289.  
*nicobariensis*, 290.  
*quoyii*, 289.  
*reinwardtii*, 290, 433.  
*rubripes*, 288, 299, 438.  
*stairii*, 290.  
*tumulus*, 290.  
*wallacei*, 290.
- Meiglyptes**  
*jugularis*, 182.
- Melampus**  
*coffa*, 405.  
*fasciatus*, 232, 405.  
*oblongus*, 405.  
(*Tralia*) *striatus*, 244.
- Melanitis**  
*leucocyma*, 53.  
*melane*, 53.  
*mimalon*, 52.
- Melanopsis**  
*helena*, 384.
- Meleagrina**  
*placunoides*, 405.
- Meleagris**  
*gallopavo*, 368, 402.  
*lindsayi*, 288.  
*mexicana*, 402.  
*ocellata*, 234, 402.
- Mellivora**  
*ratel*, 307.
- Mephitis**  
*intermedia*, 280.  
*leuconota*, 280.  
*longicaudata*, 280.  
*mesoleuca*, 280.
- Merops**  
*ornatus*, 433.
- Merula**  
*leucogenys*, 70.

- Microeca**  
*conspicillata*, 435.  
*flavivirescens*, 435.
- Microglossa**  
*alecto*, 365, 437.  
*aterrina*, 437.
- Micropterus**  
*cinereus*, 367.  
*patachonicus*, 46.
- Milvus**  
*govinda*, 265.
- Mimon**, 106, 108.  
*bennettii*, 106.
- Miniopterus**  
*dasythrix*, 39.  
*schreibersii*, 39.
- Minla**  
*cinerea*, 202.
- Mitra**  
*adamsi*, 205.  
*arabica*, 205.  
*aurora*, 205.  
*gambiana*, 206.  
*striatula*, 404.
- Mniotilta**  
*varia*, 70.
- Modiola**  
*tulipa*, 405.
- Moerchia**, 147.  
*nystii*, 148.
- Molossus**  
*acetabulosus*, 69.  
*fuliginosus*, 68.  
*fumarius*, 68.  
*limbatus*, 40.  
*natalensis*, 69.  
*obscurus*, 68.
- Monarcha**  
*cinerascens*, 435.  
*chrysomela*, 435.  
*dichroa*, 435.  
*griseogularis*, 435.  
*guttula*, 435.  
*inornata*, 435.  
*leucotis*, 435.  
*leucura*, 435.  
*melanoptera*, 435.  
*telescopthalma*, 435.
- Monitor**  
*flavescens*, 215.  
*niloticus*, 109, 268.
- Monophyllus**, 87, 89.  
*leachii*, 278.  
*redmanii*, 63, 64, 91.
- Mormoops**  
*blainvillii*, 65.
- Morpho**  
*bioculatus*, 53.
- Moschus**  
*kanchil*, 101.  
*stanleyanus*, 367.
- Mugil**  
*nepalensis*, 222.  
*proboscideus*, 375.
- Muraena**  
*bengalensis*, 226.  
*maculata*, 226.
- Murex**, 404.
- Mus**  
*musculus*, 281.  
*rattus*, 64.  
*tectorum*, 64.
- Muscicapa**  
*altiloqua*, 72.  
*brevirostris*, 406.  
*colonus*, 381.  
*flicauda*, 382.  
*olivacea*, 408.  
*pagana*, 406.  
*plumbea*, 210.  
*rustica*, 408.  
*sibilatrix*, 211.  
*simplex*, 211.  
*vociferans*, 211.
- Muscipeta**, 268.  
*albiceps*, 406.  
*leucocilla*, 381.  
*monacha*, 382.
- Musophaga**  
*olivacea*, 367.  
*violacea*, 59, 367.
- Mustela**  
*frenata*, 287.  
*sibirica*, 390.
- Mycetes**, 249.
- Mycteria**  
*senegalensis*, 234.
- Myiagra**  
*latirostris*, 434.
- Myiarchus**  
*validus*, 76.  
*stolidus*, 77.
- Myiobius**  
*pallidus*, 77.  
*stolidus*, 77.
- Myiolestes**  
*affinis*, 430, 435.  
*aruensis*, 435.  
*megarhynchus*, 435.  
*pulverulentus*, 435.
- Myoxomys**, 284.  
*bicolor*, 284.  
*latimanus*, 284.  
*salvinii*, 285.
- Myoxus**  
*avellanarius*, 368.
- Myriotrochus**, 58.
- Mythomys**, 275.  
*velox*, 275.
- Mytilus**  
*cxustus*, 405.  
*lavallianus*, 405.
- Myxus**  
*harengus*, 376.
- Myzomela**  
*chermisina*, 434.  
*erythrocephala*, 434.  
*nigrita*, 434.
- Naia**  
*haje*, 209, 265.  
*tripudians*, 219.
- Nandinia**  
*binotata*, 234.
- Nanina**  
*cæsia*, 20.
- Nannoperca**, 116.  
*australis*, 116.
- Nasiterna**  
*pygmaea*, 437.
- Nassa**, 404.
- Nasua**  
*fusca*, 280.
- Natalus**  
*stramineus*, 65.
- Natica**  
*canrena*, 404.  
*clausa*, 404.  
*dillwynii*, 404.  
*sordida*, 405.
- Nautilus**  
*fascia*, 152.
- Navicella**, 268.
- Nectarinia**  
*amasia*, 433.  
*aspasia*, 433.  
*eques*, 433.  
*eximia*, 433.  
*frenata*, 433.  
*zenobia*, 433.
- Nematoideum**  
*colubri-americani*,  
 124.  
*colubri-blumenbachii*,  
 124.
- Nerita**  
*peloronta*, 405.  
*tessellata*, 405.  
*versicolor*, 405.
- Neritina**  
*pritchardi*, 206.  
*viridis*, 405.  
*wallacii*, 206.
- Nesopsar**  
*nigerrimus*, 74.
- Neotoma**  
*ferruginea*, 282.
- Nesotragus**  
*moschatus*, 268.
- Nicon**, 87.  
*leachii*, 91.
- Nidalia**  
*occidentalis*, 296.

- Nitidula, 201.  
   *campbelli*, 201.
- Noctilio  
   *americanus*, 68.
- Notherodius  
   *holostictus*, 81.
- Notoplax, 385.  
   *speciosa*, 385.
- Novacula, 414.
- Novaculichthys, 414.  
   *taniurus*, 414.
- Nucifraga  
   *caryocatactes*, 396.
- Nullipora, 153.
- Numenius  
   *uropygialis*, 438.
- Numida  
   *meleagris*, 80.
- Nyctea  
   *nivea*, 394.
- Nyctibius  
   *jamaicensis*, 77.
- Nycticejus  
   *planirostris*, 33.
- Nycticorax  
   *violaceus*, 81.
- Nyctidromus  
   *derbianus*, 78.
- Nyctiellus  
   *lepidus*, 65.
- Nyctinomus  
   *brasiliensis*, 68,  
   69.  
   *murinus*, 68.  
   *nasutus*, 68.
- Nyctipithecus  
   *trivirgatus*, 101.
- Ocana, 143.  
   *helicina*, 143.
- Odacina, 417.
- Odax, 418.  
   *mohuccanus*, 409.
- Oleacina  
   *conferta*, 26.  
   *decidua*, 26.  
   *multispira*, 26.  
   *saccata*, 26.  
   *turgida*, 26.
- Olisthops, 418.
- Oliva  
   *fusiformis*, 404.  
   *nivea*, 404.  
   *reticulata*, 404.
- Olivella  
   *bullula*, 404.  
   *eburnea*, 404.  
   *jaspidea*, 404.  
   *oryza*, 404.
- Ophiocephalus  
   *latus*, 222.  
   *punctatus*, 222.
- Ophiognathus  
   *ampullaceus*, 235.
- Ophthalmolepis, 413.  
   *lincolatus*, 413.
- Oreinus  
   *hodgsonii*, 224.  
   *maculatus*, 224.
- Oriolus  
   *melanotis*, 434.  
   *mülleri*, 434.  
   *striatus*, 434.
- Ortalida, 367.
- Orthaliscus  
   *mars*, 25.
- Orthotomus  
   *coronatus*, 200.
- Ortyx  
   *virginianus*, 80, 234.
- Ostrea  
   *cumingii*, 146.
- Otis  
   *tarda*, 101, 398.  
   *tetrax*, 367.
- Otolicnus  
   *apicalis*, 274.
- Otolithus  
   *argenteus*, 222.
- Otus  
   *grammicus*, 80.  
   *vulgaris*, 101.
- Ovis  
   *ammon*, 235.  
   *arics*, 101, 234, 307.  
   *cycloceros*, 368.  
   *tragelaphus*, 234, 366.  
   *vignei*, 368.
- Ovulum  
   *gibbosum*, 404.
- Oxyglossus  
   *lima*, 189.
- Oxyrhopus  
   *clælia*, 15.  
   *petolaris*, 15.  
   *trigeminus*, 15.
- Pachycephala  
   *griseiceps*, 435.  
   *griseonota*, 429,  
   435.  
   *lugubris*, 435.  
   *monacha*, 435.  
   *rufipennis*, 435.  
   *spinicauda*, 435.  
   *virescens*, 435.
- Pachycheilus  
   *corvinus*, 233.
- Pachyrhamphus  
   *niger*, 77.
- Pachyrhamphus  
   *nigrescens*, 77.
- Pachysoma  
   *labiatum*, 11.
- Pagophila  
   *eburnea*, 400.
- Palæornis, 367.  
   *alexandri*, 368.
- Paludinea, 233.
- Pandion  
   *leucocephalus*, 433.
- Pandora  
   *cumingii*, 272.
- Paradiesa  
   *apoda*, 436.  
   *atra*, 436.  
   *bartlettii*, 431, 436.  
   *papuana*, 431, 436.  
   *regia*, 436.  
   *rubra*, 430, 436.  
   *searpennis*, 436.  
   *speciosa*, 436.  
   *wilsoni*, 436.
- Paradoxurus  
   *pallasii*, 136.  
   *typus*, 365.
- Parias  
   *maculata*, 220.
- Paroides  
   *biarmicus*, 368.
- Parra, 268.  
   *gallinacea*, 438.
- Partula  
   *caledonica*, 389.
- Parula  
   *americana*, 70.
- Pastor  
   *corythaix*, 184.
- Patagienas  
   *caribæa*, 80.
- Pecten  
   *nodosus*, 405.  
   *ziczac*, 405.
- Pelidna  
   *pusilla*, 80.
- Pelophilus  
   *fordii*, 142.
- Peltops  
   *blainvillei*, 433.
- Penelope  
   *purpurascens*,  
   234.
- Pentacrinus  
   *caput-medusæ*, 87.
- Pentastoma  
   *denticulatum*, 124.  
   *oxycephalum*, 124.
- Perdix  
   *hodgsoniæ*, 198.
- Perna  
   *ephippium*, 405.

- Pernis**  
*apivorus*, 366.  
 (Hemicopernis) *longicauda*, 433.
- Petalocochnus**, 146, 334, 336.  
*cereus*, 351.  
*flavescens*, 361.  
*macrophragma*, 360.  
*nerinaeoides*, 350.  
*octosectus*, 350.  
*renisectus*, 338, 346.  
*varians*, 338.
- Petrochelidon**  
*euchrysea*, 72.  
*fulva*, 72.
- Petroica**  
*hypoleuca*, 434.
- Phacocherus**  
*aliani*, 30, 101.  
*ethiopicus*, 30, 93.
- Phaëton**  
*phaenicurus*, 183.
- Phalangista**  
*chrysorrhos*, 318.  
*maculata*, 317.  
*vulpina*, 234, 366, 367.
- Phalaropus**  
*hyperboreus*, 438.
- Pharella**  
*ovalis*, 423.
- Phascolomys**  
*latifrons*, 268.  
*wombat*, 269.
- Phasianella**  
*pulchella*, 405.  
*pullus*, 405.
- Phasianus**  
*colchicus*, 234.
- Phellia**  
*vestita*, 299.
- Philine**, 405.
- Philodryas**  
*schottii*, 325.  
*serra*, 14.  
*viridissimus*, 13, 14, 325.
- Philydor**  
*amaurotis*, 379.  
*erythrocerus*, 379.  
*pyrrhodes*, 378.  
*ruficaudatus*, 379.  
*ruficollis*, 378.  
*rufus*, 378.  
*striaticollis*, 378.  
*subfulvus*, 377.  
*superciliaris*, 378.
- Phlogenas**  
*cruenta*, 366.
- Phoca**  
*vitulina*, 366, 367.
- Phœnicopterus**, 367.
- Pholas**  
*striata*, 405.
- Phorus**  
*agglutinans*, 405.
- Phrygilus**  
*melanoderus*, 47.  
*xanthogrammus*, 47.
- Phrynocephalus**  
*helioscopus*, 50.
- Phrynosoma**  
*cornutum*, 59.
- Phyllomyias**  
*griseocapilla*, 382.  
*semifusca*, 383.
- Phyllonycteris**  
*poeyi*, 65.
- Phyllophora**, 90.
- Phyllostoma**, 108.  
*bennettii*, 103, 106.  
*bidens*, 107.  
*brachyotum*, 64.  
*brevicaudum*, 104.  
*childreni*, 107.  
*crenulatum*, 107.  
*elongatum*, 104, 105, 106.  
*hastatum*, 89.  
*litturatum*, 107.  
*obscurum*, 64.  
*perspicillatum*, 64.  
*planirostre*, 64.  
*scrobiculatum*, 105.  
*spectrum*, 103.  
*superciliatum*, 64.
- Phyllostrephus**  
*capensis*, 396.
- Physa**  
*sowerbyana*, 231.  
*purpurostoma*, 231.  
 (Ameria) *carinata*, 143.  
 (Ameria) *cumingii*, 144.  
 (Ameria) *mæsta*, 144.  
 (Ameria) *obesa*, 144.  
 (Ameria) *truncata*, 144.
- Physopsis**  
*jukesii*, 144.
- Piaya**  
*pluvialis*, 79.
- Picus**  
*major*, 365.
- Pileopsis**  
*militaris*, 405.
- Pimelodus**  
*bagarius*, 223.  
*cenia*, 222.
- Pimelodus**  
*silundia*, 223.
- Pinna**  
*rudis*, 405.  
*trigonalis*, 242.
- Pionus**  
*vinaceicollis*, 79.
- Pisania**  
*turbinella*, 404.
- Pitangus**  
*caudifasciatus*, 76.
- Pitta**  
*macklottii*, 434.  
*novæ-guineæ*, 434.
- Planaxis**  
*plumbea*, 244.  
*semisulcata*, 404.
- Planorbis**  
*corpulentus*, 231.  
*duenasianus*, 232.  
*tumidus*, 232.  
*wylidi*, 232.  
 (Helisoma) *lautus*, 145.
- Platalea**  
*ajaja*, 46.
- Platycercus**  
*dorsalis*, 436.  
*penmantii*, 234, 367.
- PlatyGLOSSUS**, 411.  
*annularis*, 411.
- Platysaris**  
*nigra*, 77.
- Platyrhynchus**  
*flavigularis*, 382.  
*paganus*, 406.  
*platurus*, 381.
- Platystacus**  
*chaca*, 223.
- Platyurus**  
*schneiderianus*, 189.
- Plectrophanes**  
*nivalis*, 365.
- Plectropoma**  
*dentes*, 392.  
*richardsonii*, 391.
- Pleiocercus**  
*æqualis*, 227.  
*elapoides*, 228.
- Pleurobranchus**  
*delicatus*, 245.
- Podargus**  
*marmoratus*, 433.  
*ocellata*, 433.  
*papuensis*, 433.  
*superciliaris*, 428, 433.
- Podiceps**  
*dominicus*, 82.
- Podilymbus**  
*podiceps*, 82.
- Pœcilonetta**  
*bahamensis*, 59.

- Poëphila*  
*cineta*, 198, 234,  
 365.  
*Polioptila*  
*buffonii*, 127.  
*Polychrus*  
*marmoratus*, 13.  
*Polypedates*  
*maculatus*, 189, 220.  
*Polytmus*  
*cephalater*, 79.  
*Pomatorhinus*  
*isidori*, 434.  
*Porphyrio*  
*martinicus*, 81, 367.  
*Porzana*  
*carolina*, 81.  
*jamaicensis*, 81.  
*Potamocheirus*  
*albifrons*, 277.  
*penicillatus*, 62, 96,  
 277.  
*Potamogale*, 274.  
*Pratincola*  
*rubicola*, 234.  
*Presbytes*  
*entellus*, 368.  
*Prochilus*  
*labiatus*, 367.  
*Proctotretus*  
*tælsneri*, 16.  
*Procyon*  
*lotor*, 366.  
*Proteus*  
*anguinus*, 365.  
*Psammophilis*  
*collaris*, 216.  
*sibilans*, 209, 265.  
*Psarocolius*  
*leucopteryx*, 74.  
*Psephotus*  
*hematorrhous*, 234.  
*multicolor*, 234.  
*Pseudechis*  
*porphyriaca*, 368.  
*Pseudocheilinus*, 409.  
*hexatænia*, 409.  
*Pseudocoris*, 411.  
*heteropterus*, 411.  
*Pseudodax*, 409.  
*moluccanus*, 409.  
*Pseudojulis*, 412.  
*girardi*, 412.  
*Pseudolabrus*, 413.  
*rubiginosus*, 413.  
*Pseudoscops*  
*grammicus*, 80.  
*Psittacara*  
*nana*, 79.  
*Psittacodis*  
*aruensis*, 436.  
*Psittacodis*  
*polychloros*, 436.  
*tarabe*, 436.  
*Psittacula*  
*desmarestii*, 437.  
*diopthalma*, 437.  
*Psittacus*  
*aruensis*, 437.  
*capistratus*, 437.  
*collarius*, 79.  
*leucocephalus*, 79.  
*personatus*, 436.  
*pucherani*, 436.  
*rhodops*, 436.  
*timneh*, 101.  
*Psophia*  
*crepitans*, 366.  
*Pteragogus*, 416.  
*Pterapon*  
*trivittatus*, 221.  
*Pterocles*  
*alchata*, 368.  
*Pteromys*  
*momoga*, 137.  
*volucella*, 281.  
*Pteropus*  
*edulis*, 12.  
*edwardsii*, 101, 136,  
 268.  
*medius*, 268.  
*Ptilogonys*  
*armillata*, 73.  
*Ptilonopus*  
*aurantiifrons*, 437.  
*coronulatus*, 437.  
*cyanovirens*, 437.  
*iozonus*, 437.  
*nanus*, 437.  
*perlatus*, 437.  
*prasinorrhous*, 437.  
*pulchellus*, 437.  
*rivoli*, 437.  
*roseipectus*, 431, 437.  
*strophium*, 437.  
*superbus*, 437.  
*virens*, 437.  
*viridis*, 437.  
*wallacei*, 437.  
*Ptilonorhynchus*  
*buccoides*, 436.  
*melanotis*, 436.  
*Ptilotis*  
*assimilis*, 434.  
*auriculata*, 434.  
*flaviventris*, 428, 434.  
*fumata*, 434.  
*megarkynchus*, 428,  
 434.  
*polygramma*, 429, 434.  
*similis*, 428, 434.  
*sonoroides*, 428, 434.  
*Ptilotis*  
*striolata*, 434.  
*Pupa*  
*sericina*, 388.  
*weinlandi*, 146.  
*Pupina*  
*mouhoti*, 196.  
*Pupinella*  
*borneensis*, 389.  
*Purpura*  
*bicostalis*, 404.  
*deltoides*, 404.  
*undata*, 404.  
*Pycnonotus*  
*aurigaster*, 395, 396.  
*capensis*, 396.  
*Pygosceles*  
*wagleri*, 47.  
*Pyranga*  
*rubra*, 366.  
*Pyrrhula*  
*violacea*, 74.  
*Pythia*  
*wallacii*, 28.  
*Python*  
*bivittatus*, 215.  
*molurus*, 215, 234.  
*reticulatus*, 189.  
*tigris*, 215.  
*Querquedula*  
*crecca*, 393.  
*discors*, 82.  
*Querula*  
*fuscocinerea*, 210.  
*Rallina*  
*oculea*, 438.  
*tricolor*, 438.  
*Rallus*  
*crepitans*, 81.  
*longirostris*, 81.  
*pumbeiventris*, 432,  
 438.  
*Ramphastos*  
*ariel*, 59.  
*toco*, 366.  
*Ramphocœnus*  
*rufiventris*, 380.  
*sanctæ marthæ*, 380.  
*Ramphocelus*  
*ephippialis*, 130.  
*Rana*  
*liebigii*, 220.  
*mugiens*, 366.  
*sylvatica*, 366.  
*tigrina*, 189, 220.  
*Ranella*  
*caudata*, 404.  
*Rectes*  
*cerviniventris*, 430, 435.

- Rectes**  
*cirrocephalus*, 435.  
*dichrous*, 435.  
*leucorhynchus*, 430,  
 435.  
*strepitans*, 435.  
*uropygialis*, 430, 435.
- Regenia**  
*albugularis*, 113, 234.  
*ocellata*, 60, 113.
- Reguloidea**  
*viridipennis*, 200.
- Reithrodon**  
*longicauda*, 284.  
*mexicana*, 284.
- Rhacophorus**  
*maximus*, 220.
- Rhea**  
*americana*, 59.
- Rhinoceros**  
*crossii*, 307.  
*sumatranus*, 307.
- Rhinocetus**  
*jubatus*, 30.
- Rhinopoma**  
*carolinensis*, 68.
- Rhipidura**  
*assimilis*, 434.  
*atripennis*, 435.  
*gularis*, 434.  
*maculipectus*, 434.  
*hyperythra*, 434.  
*rufiventris*, 434.  
*threnothorax*, 434.
- Rhyacophilus**  
*solitarius*, 80.
- Rohita**  
*microlepidota*, 225.
- Rusa**  
*japonica*, 236, 365.  
*peronii*, 138.
- Saccanthus**  
*maderensis*, 305.
- Saccobranthus**  
*fossilis*, 223.
- Saccolarynx**  
*flagellum*, 235.
- Sagartia**  
*affinis*, 299.  
*parasitica*, 299.
- Salamandra**  
*maculata*, 365.
- Salarias**  
*atlanticus*, 369.
- Salmo**  
*grayii*, 391.
- Saltator**  
*isthmicus*, 130.
- Sanguinolaria**  
*rugosa*, 405.
- Saxicola**  
*ananthe*, 265.
- Scalaria**  
*clathrus*, 405.  
*fragilis*, 405.  
*tenuis*, 405.
- Scatophagus**  
*argus*, 221.
- Schistura**  
*scaturigina*, 225.
- Schizostoma**, 105, 108.  
*minutum*, 105.
- Sciurus**  
*cinereus*, 365.  
*eborivorus*, 276.  
*gerrardi*, 92.  
*javensis*, 137.  
*ludovicianus*, 281.  
*maclellandii*, 137.  
*macroura*, 281.  
*magnicaudatus*, 281.  
*minutus*, 276.  
*mouhotii*, 137.  
*mutabilis*, 276.  
*nordhoffii*, 276.  
*palliatu*s, 276.  
*pyrrhopus*, 276.  
*rubripes*, 276.  
*rufiventer*, 281.  
*rufobrachium*, 276.  
*siamensis*, 137.  
*splendens*, 137.  
*stangeri*, 276.  
*subalbidus*, 276.  
*subauratus*, 281.  
*wilsonii*, 276.
- Sclerostoma**  
*armatum*, 271.  
*equinum*, 271.
- Scolopax**, 438.
- Scotophilus**  
*capensis*, 36.  
*kuhlii*, 35.  
*marginatus*, 35.  
*minutus*, 33.  
*rusticus*, 35.  
*ursinus*, 278.  
*variegatus*, 36.
- Scytale**  
*coronatum*, 15.
- Scytalopus**  
*magellanicus*, 47.
- Seiurus**  
*gossii*, 70.  
*ludovicianus*, 70.  
*noveboracensis*, 70.
- Segmentina**  
*donbilli*, 232.
- Semele**  
*exigua*, 385.  
*obliqua*, 405.
- Semele**  
*subtruncata*, 405.
- Semicossyphus**, 415.
- Sericulus**  
*anais*, 434.  
*aureus*, 434.
- Serpentarius**  
*reptilivorus*, 364.
- Serpula**, 147, 152.  
*afra*, 156.  
*annulata*, 156, 334.  
*bicarinata*, 162.  
*decussata*, 342.  
*dentifera*, 163.  
*gigantea*, 167.  
*glomerata*, 355.  
*granifera*, 364.  
*intorta*, 353.  
*lumbricalis*, 173, 354.  
*maxima*, 166.  
*nebulosa*, 162.  
*parvula*, 357.  
*regularis*, 177.  
*scalata*, 358.  
*sipho*, 364.  
*spirorbis*, 329, 330.  
*tortrix*, 364.  
*tortuosa*, 170.  
*turbinata*, 148.  
*turboides*, 163.  
*vermetus*, 174.  
*vermicella*, 357.
- Serpularia**  
*circumcarinata*, 175.
- Serpulites**  
*wilsonianus*, 330.
- Serpuloides**  
*varians*, 338.
- Serpulorbis**  
*varians*, 338.
- Serranus**  
*sex-fasciatus*, 220.
- Sessama**, 268.
- Setophaga**  
*ruticilla*, 72.
- Sialia**  
*wilsoni*, 366.
- Sigmodon**  
*berlandieri*, 281.
- Siliquaria**  
*carpenteri*, 426.  
*nitidissima*, 426.  
*peruana*, 426.  
*rosea*, 150.
- Siliquarius**, 148.
- Sillago**  
*sikama*, 221.
- Silundia**  
*gangetica*, 223.
- Silurus**  
*fossilis*, 223.

- Silurus**  
*singio*, 223.
- Simotes**  
*albobincta*, 216.  
*octolineatus*, 216.  
*purpurascens*, 216.  
*russellii*, 216.  
*tenuatus*, 189.
- Simpulopsis**  
*ænea*, 27.  
*cumingi*, 27.
- Siphia**  
*erithacus*, 201.
- Siphonaria**  
*brunnea*, 405.  
*picta*, 405.
- Siphonium**, 147, 152.  
*aculeata*, 162.  
*anaulax*, 163.  
*biangularis*, 168.  
*carinatum*, 165, 352.  
*cariniferum*, 165.  
*costale*, 165.  
*effusum*, 181.  
*fasciatum*, 152.  
*fissurata*, 163.  
*gæderopi*, 163.  
*gigas*, 167.  
*imbricata*, 163.  
*luridum*, 164.  
*margaritarum*, 164.  
*maximum*, 166.  
*nebulosum*, 146, 162.  
*pictum*, 161.  
*planorboides*, 163.  
*prælonga*, 169.  
*rugosa*, 163.  
*scandens*, 167.  
*serrata*, 162.  
*subgranosum*, 165.  
*turboides*, 161, 162.  
 (Dendropoma) *afrum*, 156.  
 (Dendr.) *centiquadra*, 154.  
 (Dendr.) *lituella*, 154.  
 (Dendr.) *leucozonias*, 155.  
 (Dendr.) *megamastum*, 153.  
 (Dendr.) *teredula*, 155.  
 (Stoa) *bifunicularis*, 158.  
 (Stoa) *cristatum*, 158.  
 (Stoa) *da-costæ*, 157.  
 (Stoa) *platypus*, 157.  
 (Stoa) *politum*, 156.  
 (Stoa) *scaphitella*, 160.  
 (Stoa) *scaphitoides*, 159.  
 (Stoa) *spinosum*, 159.
- Siphonium**  
 (Stoa) *squamulosum*, 158.  
 (Stoa) *subcrenatum*, 157.  
 (Stoa) *subdecussatum*, 158.  
 (Stoa) *textum*, 159.  
 (Stoa) *unguiculatum*, 160.
- Siphonorbis**, 77.  
*americanus*, 77.
- Solarium**, 147  
*nystii*, 148.
- Solecustus**  
*dombei*, 405.
- Solen**  
*aspersus*, 420.  
*exiguus*, 419.  
*fonessii*, 419.  
*grandis*, 418.  
*regularis*, 419.  
*leanus*, 419.  
*malaccensis*, 419.  
*pfeifferi*, 420.  
*rostriformis*, 421.  
*rostrum-anatis*, 420.  
*vitreus*, 420.  
*woodwardi*, 420.
- Somateria**  
*stelleri*, 400.
- Sorex**  
*micrurus*, 279.
- Spatula**  
*clypeata*, 82.
- Spectrellum**  
*macrourum*, 65.
- Spermophila**  
*anoxantha*, 74.
- Spheniscus**  
*magellanicus*, 47.
- Sphenopsis**, 379.  
*ignobilis*, 379.
- Sphenura**  
*superciliaris*, 378.  
*poliocephala*, 378.
- Spilotes**  
*corais*, 14, 228, 324.  
*hodgsoni*, 218.  
*melanurus*, 218.  
*pæcilstoma*, 14, 324.  
*reticularis*, 218.  
*variabilis*, 13, 14, 324.
- Spindalis**  
*nigricephala*, 74.
- Spiraxis**  
*boucardi*, 24.  
*cobanensis*, 231.  
*lattrei*, 230.  
*shuttleworthii*, 230.
- Spiroglyphus**, 152, 326.  
*albidus*, 332.  
*ammonitiformis*, 329.  
*annulatus*, 330.  
*contrarius*, 329.  
*corrodens*, 331.  
*crustans*, 333.  
*da-costæ*, 157.  
*dentifera*, 331.  
*disculus*, 329.  
*erythraensis*, 329.  
*glomeratus*, 146, 331, 333.  
*immersa*, 328.  
*lemniscatus*, 328.  
*marginatus*, 334.  
*planorbis*, 329.  
*politus*, 156.  
*scaphitoides*, 327.  
*schroeteri*, 330.  
*solidissima*, 328.  
*spinalis*, 328.  
*spirorbis*, 330.  
*spiruliformis*, 155, 327.  
*stramonitæ*, 330.  
*trochicola*, 332.  
*tubulosa*, 334.  
*vortex*, 327.
- Spiroptera**  
*crassicauda*, 122.  
*obtusa*, 121.
- Spirula**  
*fragilis*, 404.
- Spizaëtus**  
*occipitalis*, 234.
- Spondylus**  
*digitalis*, 405.  
*longitudinalis*, 405.  
*microlepis*, 158.
- Squatarola**  
*helvetica*, 398.
- Stenops**  
*javanicus*, 265.
- Stenorhina**  
*ventralis*, 228.
- Stephopoma**, 147, 148, 153.  
*bispinosum*, 152.  
*pennatum*, 151.  
*roseum*, 150.  
*senticosum*, 150.  
*tricuspe*, 150.
- Sterna**  
*gracilis*, 438.  
*melanauchen*, 438.  
*paynana*, 438.  
*poliocerca*, 438.  
*regia*, 82.  
*torresii*, 438.
- Stethojulis**, 412.

- Stoa**, 152, 326.  
*ammonitiformis*, 154, 329.  
*bifunicularis*, 158.  
*cristata*, 158.  
*da-costæ*, 157.  
*perforans*, 156.  
*platypus*, 157.  
*polita*, 156.  
*scaphitella*, 160.  
*scaphitoides*, 159.  
*spinosa*, 159.  
*spirulæformis*, 327.  
*squamulosa*, 158.  
*subcrenata*, 157.  
*subdecussata*, 158.  
*texta*, 159.  
*unguiculata*, 160.
- Strepsiceros**  
*kudu*, 208, 264.
- Streptaxis**  
*eburnea*, 23.  
*sinuosa*, 23.
- Streplophorus**  
*seba*, 227.
- Strix**, 268.  
*pratincola*, 79.
- Strombus**  
*pugilus*, 404.
- Strongylus**  
*acuticaudatus*, 123.  
*nodularis*, 122.  
*paradoxus*, 121.  
*spiculatus*, 123.  
*tubifex*, 122.
- Struthio**  
*camelus*, 307, 439.
- Sturnella**  
*ludoviciana*, 30.
- Sturnira**, 278.
- Succinea**, 405.  
*scalarina*, 28.  
*putris*, 230.
- Sula**  
*fiber*, 438.
- Suricata**  
*zenic*, 59.
- Sus**, 139, 263.  
*indicus*, 63.  
*scrofa*, 63.
- Sycalis**  
*brasiliensis*, 74.  
*chrysops*, 376.
- Sylvicola**  
*eoæ*, 71.  
*æstiva*, 71.  
*pannosa*, 71.  
*phætra*, 71.
- Syma**  
*torotoro*, 433.
- Synallaxis**  
*fuliginiceps*, 377.  
*ruficapilla*, 377.
- Synapta**, 58.
- Syngnathus**, 239.
- Synæcus**  
*australis*, 101.
- Syrnium**  
*aluco*, 366.
- Syrrhaptus**  
*paradoxus*, 196, 203, 234, 264, 397.
- Tadorna**  
*radjah*, 433.
- Tænia**  
*infundibuliformis*, 120.  
*lævis*, 120.  
*lanceolata*, 120.  
*multiformis*, 119.  
*paradoxa*, 119.  
*pusilla*, 119.
- Talegallus**  
*cuvieri*, 288, 438.  
*lathamii*, 288.
- Talpa**, 390.  
*leucura*, 135.
- Tamandua**  
*tetradactyla*, 287.
- Tanagra**  
*subcinerea*, 129.  
*zena*, 74.
- Tanagrella**  
*ruficollis*, 73.
- Tanygnathus**  
*macrorhynchus*, 436.  
*marginatus*, 436.
- Tanysiptera**  
*galatea*, 433.  
*hydrocharis*, 433.  
*sylvia*, 433.
- Taphrometopon**, 48.  
*lineolatum*, 48.
- Tapirus**  
*americanus*, 59.
- Tautoga**, 417.
- Tellina**  
*bimaculata*, 405.  
*clausa*, 405.  
*interrupta*, 405.  
*levigata*, 405.  
*magna*, 405.  
*mera*, 405.  
*radiata*, 405.  
*searadiata*, 405.
- Tenagoda**, 148.
- Terebra**  
*hastata*, 404.
- Teredo**, 152, 314.  
*furcelloides*, 314.
- Testudo**  
*elongata*, 139.  
*horsfieldii*, 214.  
*javânica*, 214.  
*kachuga*, 214.  
*ocellatus*, 214.
- Tetrao**  
*australis*, 291.  
*falklandicus*, 46.
- Tetrapteryx**  
*paradisæa*, 209, 265.
- Tetrax**  
*campestris*, 398.
- Thalasseus**  
*cayanus*, 82.
- Thammistes**  
*æquatorialis*, 380.  
*anabatinus*, 380.
- Thammodynastes**  
*nattereri*, 14.  
*punctatissimus*, 15.
- Therapon**  
*servus*, 221.
- Thylacodus**, 336.
- Tickellia**, 199.  
*hodgsoni*, 199.
- Tiliqua**  
*rufescens*, 215.
- Tinamus**, 134.  
*robustus*, 234.  
*variegatus*, 234.
- Tinnunculus**  
*alaudarius*, 367.
- Tityra**  
*leucocotus*, 77.
- Todopsis**  
*bonapartei*, 434.  
*cyanocéphala*, 434.  
*wallacii*, 429, 434.
- Todus**  
*viridis*, 77.
- Trachischium**  
*fuscum*, 215.  
*rugosum*, 216.
- Trachops**, 103, 107, 108.  
*fuliginosus*, 103, 107.
- Trachycyclus**  
*superciliaris*, 16.
- Trachynotus**  
*ovatus*, 222.
- Tragelaphus**  
*albovittatus*, 276.  
*euryceros*, 276.
- Tenagoda**, 148.
- Tragus**  
*affinis*, 138.
- Trematoda**, 118.
- Trichocephalus**  
*affinis*, 121.

- Trichoglossus**  
*capistratus*, 436.  
*coccineifrons*, 436.  
*cyanogrammus*, 436.  
*immarginatus*, 436.  
*nigrogularis*, 436.  
*ochrocephalus*, 436.
- Trichosoma**  
*aërophilum*, 121.  
*brevicolle*, 122.  
*longicolle*, 122.
- Trichotropis**  
*gouldii*, 272.
- Trimesurus**  
*viridis*, 220.
- Tringa**  
*albescens*, 438.  
*bonapartii*, 80.  
*wilsoni*, 80.
- Tringoides**  
*empusa*, 438.  
*macularius*, 80.
- Trionyx**  
*gangeticus*, 214.  
*hurum*, 214.  
*javanicus*, 214.  
*ornatus*, 41.  
*tuberculatus*, 42.
- Triton**  
*chlorostoma*, 404.  
*femorale*, 404.  
*lanceolatus*, 404.  
*lotorium*, 404.  
*tessellatus*, 404.
- Trivia**  
*pedicula*, 404.  
*quadripunctata*, 404.
- Trochilus**  
*polytmus*, 79.
- Trochocopus**, 416.
- Trochus**  
*contrarius*, 148.  
*ferrugineus*, 148.  
*modulus*, 405.
- Troglodytes**, 250.  
*calvus*, 273.  
*gorilla*, 198, 212, 277.  
*hypaëdon*, 128.  
*koolookamba*, 273.  
*niger*, 273.  
*parvulus*, 366.
- Tropidonotus**  
*cerasogaster*, 218.  
*chrysargus*, 217.  
*fasciatus*, 366.  
*natrix*, 390.  
*ordinatus*, 228, 367.  
*orientalis*, 391.  
*platyceps*, 217.  
*quincunciatus*, 189, 217.
- Tropidonotus**  
*stolatus*, 217.  
*umbratus*, 217.
- Tropidophorus**  
*cochinchinensis*, 188.  
*grayi*, 189.  
*microlepis*, 188.
- Tropidorhynchus**  
*marginatus*, 429, 434.  
*mitratus*, 434.  
*novæ-guineæ*, 434.  
*plumigenis*, 434.
- Tropidosaurus**  
*montanus*, 189.
- Trugon**  
*terrestris*, 437.
- Tubulus**, 169.
- Tubulus**  
*anguinus*, 173.
- Tupinambis**, 61.
- Turbo**  
*cidaris*, 143.  
*helicinus*, 143.  
*pica*, 405.
- Turdus**  
*amænus*, 186.  
*aurantius*, 70.  
*jamaicensis*, 70.  
*luzoniensis*, 186.  
*macrurus*, 187.  
*mindanensis*, 186.  
*rex*, 381.
- Turritella**  
*ungulina*, 147.
- Turtur**  
*risorius*, 367.  
*suratensis*, 365.
- Tylostoma**, 104, 106, 108.  
*bidens*, 107.
- Tyrannula**  
*caniceps*, 407.  
*gossii*, 76.  
*griseocapilla*, 382.
- Tyrannus**  
*inca*, 383.  
*crinitus*, 76.
- Upupa**  
*epops*, 365, 366.
- Uranops**  
*angulatus*, 15.
- Urocissa**  
*sinensis*, 101.
- Ursus**  
*americanus*, 366, 368.  
*arctos*, 365.  
*isabellinus*, 367.
- Vampyrus**, 104.  
*auritus*, 103, 108.  
*bidens*, 104, 107.  
*cirrhosus*, 107.
- Vampyrus**  
*soricinus*, 104.  
*spectrum*, 104, 108.  
 (Lophostoma), 104.  
 (Lophostoma) *auritus*, 104.  
 (Schizostoma), 105.  
 (Schizostoma) *elongatus*, 105.
- Varanus**  
*heraldicus*, 215.  
*piquotii*, 215.
- Vermetus**, 146, 147, 169, 334, 336.  
*adansoni*, 176, 336.  
*albensis*, 176.  
*anguis*, 175.  
*annulatus*, 156, 334.  
*asperella*, 347.  
*badia*, 340.  
*bicarinatus*, 172.  
*candidissima*, 340.  
*carinatus*, 158, 176, 352.  
*cariniferus*, 165.  
*carpenteri*, 337, 339.  
*centiquadrus*, 362.  
*cereus*, 351.  
*cochleiformis*, 175.  
*conicus*, 341, 343.  
*corrodens*, 331, 346.  
*costalis*, 170, 334.  
*decussatus*, 146, 342.  
*dentiferus*, 163.  
*eburneus*, 178.  
*electrina*, 340.  
*giganteus*, 168.  
*gigas*, 166, 167.  
*glomeratus*, 333, 346.  
*gordialis*, 342.  
*gymnogastra*, 351.  
*hindsii*, 179.  
*indentata*, 345.  
*indicus*, 172, 174.  
*infundibulum*, 334.  
*intortus*, 353.  
*irregularis*, 331, 339.  
*juvenilis*, 348.  
*knorrii*, 152, 174, 405.  
*lamarckii*, 337.  
*lilacinus*, 352.  
*lispe*, 357.  
*lumbricalis*, 174, 337.  
*margaritaceus*, 164.  
*maximus*, 166.  
*nerinæoides*, 350.  
*nystii*, 148.  
*octosectus*, 350.  
*panamensis*, 178, 362.  
*pellucidus*, 177.

## Vermetus

- peronii*, 362.  
*planorbis*, 329.  
*quadrangulus*, 174.  
*radicula*, 174.  
*rastrum*, 180.  
*renisectus*, 346.  
*roseus*, 150.  
*rouyanus*, 176.  
*rugosus*, 354.  
*sipho*, 364.  
*spiratus*, 174.  
*subglomeratus*, 354.  
*subgranosa*, 180.  
*tulipa*, 363.  
*turritella*, 176.  
*varians*, 338.  
 (Aletes) *bridgesii*, 363.  
 (Aletes) *centiquadrus*, 362.  
 (Aletes) *dilatata*, 351.  
 (Aletes) *granifer*, 364.  
 (Aletes) *maxima*, 362.  
 (Aletes) *retifera*, 343.  
 (Aletes) *sipho*, 364.  
 (Aletes) *siphonata*, 363.  
 (Aletes) *tenuis*, 352.  
 (Aletes) *tortrix*, 364.  
 (Aletes) *tulipa*, 363.  
 (Macrophragma) *cochlidium*, 360.  
 (Macrophragma) *flavescens*, 361.  
 (Macrophragma) *macrophragma*, 360.  
 (Petalocochus) *cancellata*, 354.  
 (Petalocochus) *domingensis*, 353.  
 (Petalocochus) *flaris*, 357.  
 (Petalocochus) *intortus*, 353.  
 (Petalocochus) *pachylasma*, 354.  
 (Petalocochus) *parvulus*, 357.  
 (Petalocochus) *scalatus*, 358.  
 (Petalocochus) *scolopendrina*, 356.  
 (Petalocochus) *sculpturatus*, 353.  
 (Petalocochus) *subappenninica*, 353.  
 (Petalocochus) *suturalis*, 356.  
 (Petalocochus) *vermicella*, 357.  
 (Petalocochus) *woodii*, 354.

## Vermetus

- (Strebloceras) *anelum*, 359.  
 (Thylacodus) *asperula*, 347.  
 (Thylacodus) *balantinnabuli*, 359.  
 (Thylacodus) *carinatus*, 352.  
 (Thylacodus) *contortula*, 345.  
 (Thylacodus) *contortus*, 344.  
 (Thylacodus) *contortus* var. *indentata*, 346.  
 (Thylacodus) *costata*, 341.  
 (Thylacodus) *ebenea*, 349.  
 (Thylacodus) *electrina*, 340.  
 (Thylacodus) *favosa*, 345.  
 (Thylacodus) *gordialis*, 346.  
 (Thylacodus) *indentata*, 349.  
 (Thylacodus) *monile*, 339.  
 (Thylacodus) *monilifera*, 449.  
 (Thylacodus) *occlusa*, 339, 356.  
 (Thylacodus) *perlata*, 341.  
 (Thylacodus) *personata*, 341.  
 (Thylacodus) *picea*, 349.  
 (Thylacodus) *proboscis*, 343.  
 (Thylacodus) *repens*, 344.  
 (Thylacodus) *subcancellatus*, 354.  
 (Thylacodus) *woodwardi*, 348.  
 Vermicularia, 147, 169.  
*arenaria*, 163.  
*lumbricalis*, 364.  
*nodus*, 148.  
*glomerata*, 175, 342, 350.  
*sowerbii*, 148.  
*vermet*, 337.  
 Vermiculus, 152, 169.  
*albensis*, 176.  
*ampliata*, 172.  
*anguis*, 175.  
*dicarinata*, 174.  
*carinatus*, 176.  
*castanea*, 179.  
*cinerea*, 174.

## Vermiculus

- cinnamomina*, 178.  
*circumcarinatus*, 175.  
*cochleiformis*, 175.  
*cornea*, 172.  
*crassa*, 178.  
*diaphana*, 171.  
*dimorphus*, 176.  
*discifer*, 180.  
*eburneus*, 178.  
*effusus*, 181.  
*laquearis*, 177.  
*lituina*, 177.  
*lumbricalis*, 171.  
*melanosclera*, 174.  
*nidificans*, 170.  
*pellucidus*, 177.  
*picta*, 178.  
*planorboides*, 177.  
*quadrangularis*, 174.  
*rouyanus*, 176.  
*rugulosa*, 173.  
*sclaris*, 175.  
*seolarinus*, 171.  
*spiratus*, 174.  
*teres*, 173, 175.  
*tigrina*, 179.  
*tortuosus*, 170.  
*triqueter*, 176.  
*turritella*, 176.  
*ungulina*, 176.  
*unicostalis*, 170.  
*volubilis*, 178.  
 Vermilia  
*subcrenata*, 157, 349.  
 Vespertilio  
*borbonicus*, 69.  
*capensis*, 36.  
*carolinensis*, 278.  
*dasythrix*, 39.  
*minuta*, 33.  
*novaboracensis*, 69.  
*schreibersii*, 39.  
*ursinus*, 278.  
 Vipera  
*russellii*, 266.  
 Vireo  
*modestus*, 72.  
*novaboracensis*, 72.  
 Vireosylva  
*altiloqua*, 72.  
*olivacea*, 72.  
 Viverra  
*malaccensis*, 136.  
 Viverricula  
*indica*, 265.  
 Vulpes  
*cinereo-argentatus*, 280.  
*vulgaris*, 368.

- |   |   |  |
|---|---|--|
| <p>Xema<br/>  <i>sabini</i>, 401.</p> <p>Xenodon<br/>  <i>colubrinus</i>, 14, 322.<br/>  <i>purpurascens</i>, 216.<br/>  <i>rhabdocephalus</i>, 14,<br/>  322.<br/>  <i>severus</i>, 14, 322.</p> <p>Xenops<br/>  <i>caniveti</i>, 378.<br/>  <i>littoralis</i>, 379.</p> | <p>Xenops<br/>  <i>melanocephalus</i>, 378.<br/>  <i>rufifrons</i>, 378.</p> <p>Xiphocheilus, 415.</p> <p>Xiphosoma<br/>  <i>caninum</i>, 15, 115.</p> <p>Xyrichtys, 414.<br/>  <i>pavo</i>, 414.</p> <p>Zamenis<br/>  <i>atrövirens</i>, 48.</p> | <p>Zenaida<br/>  <i>amabilis</i>, 80.</p> <p>Ziphius<br/>  <i>sowerbiensis</i>, 311.</p> <p>Zoanthus<br/>  <i>rubricornis</i>, 99.</p> <p>Zoarces, 239.</p> <p>Zosterops<br/>  <i>citrinella</i>, 434.<br/>  <i>griseotincta</i>, 434.</p> |
|---|---|--|
- 

## E R R A T A.

Page 54, lines 42, 43, *after* Pl. X. fig. 1, *add* A, B.

Page 54, line 48, *instead of* "(Pl. X. fig. 3)," *read* "(Pl. X. fig. 1, E, E)."



PUBLICATIONS  
OF THE  
ZOOLOGICAL SOCIETY OF LONDON.

---

THE scientific publications of the Zoological Society are of two kinds — “Proceedings,” published in an octavo form, and “Transactions,” in quarto. At the commencement of the year 1861, a new series of the former work was commenced, under the title “Proceedings of the Scientific Meetings of the Zoological Society of London.”

According to the present arrangements, the “Proceedings” contain not only notices of all business transacted at the scientific meetings, but also all the papers read at such meetings and recommended to be published by the Committee of Publication. From forty to fifty coloured plates and engravings are attached to each annual volume of the “Proceedings,” to illustrate the new or otherwise remarkable species of animals described in them. Amongst such illustrations, figures of the new or rare species acquired in a living state for the Society’s Gardens are often given.

The “Proceedings” for each year are issued in three parts, in the months of May, August, and February, the part published in February completing the volume for the preceding year. They may be obtained with or without the illustrations.

The “Proceedings” without illustrations are delivered to the Fellows of the Society *gratis* on demand. The Fellows are likewise entitled to purchase all the other publications of the Society at a reduction of one-fourth from the price at which they are published, and to receive the Illustrated Proceedings of the Society at a fixed subscription price of 10s. per part, or £1 : 12s. for the annual volume, bound in cloth.

The “Transactions” contain such of the more important communications made to the scientific meetings of the Society as, on account of the nature of the plates required to illustrate them, are better adapted for publication in the quarto form. The numerous papers of Professor Owen on the Anthropoid Apes, and on the various species of *Dinornis*, all form part of this series.

The following is a complete list of the publications of the Society already issued. They may be obtained at the Society’s Office (11, Hanover Square, W.), at Messrs. Longmans’ the Society’s publishers, at Mr. J. Rothschild’s, the Society’s Agent at Paris and Leipzig, or through any bookseller.

Proceedings of the Committee of Science and Correspondence  
of the Zoological Society of London. 8vo. 2 vols.

Part I. 1830-31. 1 vol. 8vo.....	Price	To Fellows.	To the Public.
„ II. 1832. „ .....	„	4s. 6d.	6s.
		„ 4s. 6d.	„ 6s.

Proceedings of the Zoological Society of London. 8vo. 28 vols.

Part		Price to Fellows.	Price to the Public.	Part		Price to Fellows.	Price to the Public.
I.	1833. 1 vol. 8vo.	4s. 6d.	6s.	XV.	1847. 1 vol. 8vo.	4s. 6d.	6s.
„	II. 1834. „	4s. 6d.	6s.	„	XVI. 1848. „	4s. 6d.	6s.
„	III. 1835. „	4s. 6d.	6s.	„	XVII. 1849. „	4s. 6d.	6s.
„	IV. 1836. „	4s. 6d.	6s.	„	XVIII. 1850. „	4s. 6d.	6s.
„	V. 1837. „	4s. 6d.	6s.	„	XIX. 1851. „	4s. 6d.	6s.
„	VI. 1838. „	4s. 6d.	6s.	„	XX. 1852. „	4s. 6d.	6s.
„	VII. 1839. „	4s. 6d.	6s.	„	XXI. 1853. „	4s. 6d.	6s.
„	VIII. 1840. „	4s. 6d.	6s.	„	XXII. 1854. „	4s. 6d.	6s.
„	IX. 1841. „	4s. 6d.	6s.	„	XXIII. 1855. „	4s. 6d.	6s.
„	X. 1842. „	4s. 6d.	6s.	„	XXIV. 1856. „	4s. 6d.	6s.
„	XI. 1843. „	4s. 6d.	6s.	„	XXV. 1857. „	4s. 6d.	6s.
„	XII. 1844. „	4s. 6d.	6s.	„	XXVI. 1858. „	4s. 6d.	6s.
„	XIII. 1845. „	4s. 6d.	6s.	„	XXVII. 1859. „	4s. 6d.	6s.
„	XIV. 1846. „	4s. 6d.	6s.	„	XXVIII. 1860. „	4s. 6d.	6s.

Proceedings of the Zoological Society of London, with Illustrations.  
8vo. 13 vols.

					To Fellows.			To the Public.		
				Price	£	s.	d.	£	s.	d.
1848, containing	23	Plates	...	...	1	1	0	1	7	6
1849, „	28	„	...	...	1	1	0	1	7	6
1850, „	49	„	...	...	1	7	6	1	18	0
1851, „	22	„	...	...	0	16	0	1	1	0
1852, „	21	„	...	...	0	16	0	1	1	0
1853, „	24	„	...	...	0	18	0	1	4	0
1854, „	29	„	...	...	1	0	0	1	6	0
1855, „	45	„	...	...	1	7	6	1	18	0
1856, „	33	„	...	...	1	1	0	1	7	6
1857, „	30	„	...	...	1	1	0	1	7	6
1858, „	45	„	...	...	1	12	0	2	2	0
1859, „	48	„	...	...	1	12	0	2	2	0
1860, „	45	„	...	...	1	12	0	2	2	0

Proceedings of the Scientific Meetings of the Zoological Society of London. 8vo.

Without Illustrations.

With Illustrations.

	To Fellows.	To the Public.	To Fellows.	To the Public.
1861, Parts I., II., III. ....	1s. 6d. each.	2s. each.	10s. each.	15s. each.

Transactions of the Zoological Society of London. 4to. 3 vols. and 7 parts.

					To Fellows.			To the Public.		
				Price	£	s.	d.	£	s.	d.
Vol. I., containing	59	Plates	...	...	3	13	6	4	18	0
Vol. II., „	71	„	...	...	4	0	0	5	6	6
Vol. III., „	63	„	...	...	3	8	6	4	11	0
Vol. IV., Part 1,	8	„	...	...	0	9	6	0	12	6
„ 2,	17	„	...	...	0	18	6	1	5	0
„ 3,	5	„	...	...	0	6	0	0	8	0
„ 4,	12	„	...	...	0	18	0	1	4	0
„ 5,	11	„	...	...	0	18	0	1	4	0
„ 6,	10	„	...	...	0	18	0	1	4	0
„ 7, Section I.	4	Plates	...	...	0	16	0	1	1	0

The "Transactions" contain the following articles:—

VOL. I. 1835.

1. On the M'Horr Antelope. By E. T. Bennett, Esq.
2. On the Nervous System of *Beroë Pileus*, Lam.; and on the Structure of its Cilia. By Robert E. Grant, M.D.
3. Observations on the Laws which appear to influence the Assumption and Changes of Plumage in Birds. By William Yarrell, Esq., F.L.S. & Z.S.
4. On the Structure and Characters of *Loligopsis*, and Account of a new Species (*Lol. guttata*, Grant) from the Indian Seas. By Robert E. Grant, M.D.
5. On the Characters and Description of a new Genus of Carnivora, called *Cynictis*. By W. Ogilby, Esq., A.M.
6. On the *Chinchillidæ*, a Family of Herbivorous Rodentia, and on a new Genus referable to it. By E. T. Bennett, Esq., F.L.S., Sec. Z.S.
7. On the Sacculated Form of Stomach as it exists in the Genus *Semnopithecus*, F. Cuv. By Richard Owen, Esq., F.Z.S.
8. Description, with some additional particulars, of the *Apteryx Australis* of Shaw. By William Yarrell, Esq., F.L.S. & Z.S.
9. On the Anatomy of the *Sepiola vulgaris*, Leach; and Account of a new Species (*Sep. stenodactyla*, Grant) from the Coast of Mauritius. By Robert E. Grant, M.D.
10. On a new Genus in the Family of *Corvidæ*. By Mr. John Gould, F.L.S. Communicated by the Secretary.
11. Characters and Descriptions of several new Genera and Species of Coleopterous Insects. By the Rev. F. W. Hope, A.M.
12. Observations on the Neck of the Three-toed Sloth, *Bradypus tridactylus*, Linn. By Thomas Bell, Esq., F.R.S.
13. On the Anatomy of the Concave Hornbill, *Buceros cavatus*, Lath. By Richard Owen, Esq., F.Z.S.
14. Description of a new Genus of Acanthopterygian Fishes. By the Rev. R. T. Lowe, B.A., Corr. Memb. Z.S.
15. On the Anatomy of the Cheetah, *Felis jubata*, Schreb. By Richard Owen, Esq., F.Z.S.
16. Notice of a Mammiferous Animal from Madagascar, constituting a new form among the Viverridous Carnivora. By E. T. Bennett, Esq., F.L.S.
17. Descriptions of some new Species of Cuvier's Family of *Brachiopoda*. By W. J. Broderip, Esq.
18. On the Anatomy of the *Brachiopoda* of Cuvier, and more especially of the Genera *Terebratula* and *Orbicula*. By R. Owen, Esq., F.Z.S.
19. Some account of the Maneless Lion of Guzerat. By Capt. Walter Smee, of the Bombay Army, F.Z.S.
20. Description of a new Species of the Genus *Euryglaimus* of Dr. Horsfield. By Mr. John Gould, F.L.S.
21. A few Remarks tending to illustrate the Natural History of two Annulose Genera, viz. *Urania* of Fabricius and *Mygale* of Walckenaer. By W. S. MacLeay, Esq., F.Z.S. &c.
22. Descriptions of some new Species of *Calyptroidæ*. By W. J. Broderip, Esq.
23. On the Anatomy of the *Calyptroidæ*. By Richard Owen, Esq., F.Z.S.
24. On the Structure of the Heart in the Perennibranchiate *Batrachia*. By Richard Owen, Esq., F.Z.S.
25. On the Young of the *Ornithorhynchus paradoxus*, Blum. By Richard Owen, Esq., F.Z.S.

26. Notes on the Natural History and Habits of the *Ornithorhynchus paradoxus*, Blum. By Dr. G. Bennett.
27. Description d'un nouveau Genre de Mollusques de la Classe des Gastéropodes Pectiniibranches. Par E. Rüppell, M.D., Memb. Ext. L.S. & Z.S.
28. On *Clavagella*. By W. J. Broderip, Esq.
29. On the Anatomy of *Clavagella*, Lam. By Richard Owen, Esq., F.R.S. & Z.S.
30. On *Nycteribia*, a Genus of Wingless Insects. By J. O. Westwood, Esq., F.L.S.
31. Some Account of *Macropus Parryi*, a hitherto undescribed species of Kangaroo from New South Wales. By E. T. Bennett, Esq.
32. On the Genus *Chama*, Brug., with Descriptions of some Species apparently not hitherto characterized. By W. J. Broderip, Esq.
33. Characters and Description of a new Genus of the Family *Melolonthidæ*. By John Curtis, Esq., F.L.S. &c.
34. On a Species of Moth found inhabiting the Galls of a Plant near to Monte Video. By John Curtis, Esq., F.L.S. &c.
35. Description of a Microscopic Entozoon infesting the Muscles of the Human Body. By Richard Owen, Esq., F.R.S. & Z.S.
36. On the Anatomy of *Linguatula Tanioides*, Cuv. By Richard Owen, Esq., F.R.S. & Z.S.
37. Additional Remarks on the Genus *Lagotis*, with some Account of a second Species referable to it. By E. T. Bennett, Esq., F.L.S., Sec. Z.S.
38. Observations on the Genus *Cancer* of Dr. Leach (*Platycarcinus*, Latr.), with Descriptions of three new Species. By T. Bell, Esq., F.R.S.
39. On the Osteology of the Chimpanzee and Orang-Utan. By Richard Owen, Esq., F.R.S.
40. On the Anatomy of *Distoma clavatum*, Rud. By Richard Owen, Esq., F.R.S. & Z.S.
41. Description of a new Species of Tapeworm, *Tania lamelligera*, Owen. By Richard Owen, Esq., F.R.S. & Z.S.
42. Remarks on the Entozoa, and on the Structural Differences existing among them, including Suggestions for their Distribution into other Classes. By Richard Owen, Esq., F.R.S. & Z.S.
43. Additional Observations on *Alepisaurus ferox*. By the Rev. R. T. Lowe, M.A., Corr. Memb. Z.S.

VOL. II. 1841.

1. On the Quails and *Hemipodii* of India. By Lieut.-Colonel William Henry Sykes.
2. Descriptions of a few Invertebrated Animals obtained at the Isle of France. By Robert Templeton, Esq., Corr. Memb. Z.S.
3. On a remarkable Species of Pteropine Bat. By E. T. Bennett, Esq., F.L.S.
4. Some Account of the Crustacea of the Coasts of South America, with Descriptions of new Genera and Species; founded principally on the Collections obtained by Mr. Cuming and Mr. Miller. By Thos. Bell, Esq., F.R.S.
5. Some Observations on the Economy of an Insect destructive to Turnips. By William Yarrell, Esq.
6. Mémoire sur une nouvelle Espèce de Poisson du Genre *Histiophore*, de la Mer Rouge. Par M. E. Rüppell, M.D.
7. On the Genus *Octodon*, and on its relations with *Ctenomys*, Blainv., and *Poëphagomys*, F. Cuv., including a Description of a new Species of *Ctenomys*. By E. T. Bennett, Esq., F.L.S.

8. On the Anatomy of the Lamellibranchiate Conchifera. By Robert Garner, Esq., F.L.S.
9. Descriptions of some new and rare *Cephalopoda*. By Richard Owen, Esq., F.R.S.
10. Mémoire sur les Gerboises et les Gerbilles. Par M. Fred. Cuvier.
11. Description of a new Genus of Mammiferous Animals from Australia, belonging probably to the Order *Marsupialia*. By George R. Waterhouse, Esq.
12. Descriptions of several new Species of Insects belonging to the Family of the Sacred Beetles. By J. O. Westwood, Esq., F.L.S. &c.
13. Osteological Contributions to the Natural History of the Orang-Utans (*Simia*, Erxleben). By Richard Owen, Esq., F.R.S. &c.
14. A Synopsis of the Fishes of Madeira; with the principal Synonyms, Portuguese Names, and Characters of the new Genera and Species. By the Rev. R. T. Lowe, M.A.
15. Observations on the Genus *Galictis* (Bell), with the Description of a new Species. By Thomas Bell, Esq., V.P.Z.S., F.R.S. &c.
16. On a new Subgenus of Fishes, allied to *Ophidium*. By William Thompson, Esq.
17. Description of a new Species of Antelope. By Capt. W. C. Harris.
18. Notes on the Anatomy of the Nubian Giraffe. By Richard Owen, Esq., F.R.S. &c.
19. On a new Genus of Insectivorous Mammalia. By W. C. L. Martin, Esq., F.L.S.
20. On the Anatomy of the Southern Apteryx (*Apteryx Australis*, Shaw). By Richard Owen, Esq., F.R.S. &c.
21. Observations upon Pelagic Serpents. By Dr. Theodore Cantor.
22. Outlines of a Classification of the *Marsupialia*. By Richard Owen, Esq., F.R.S. &c.
23. On the Genus *Galeopithecus*. By G. R. Waterhouse, Esq.
24. On the Skull of the North American Badger, *Meles Labradoria* of Authors. By George R. Waterhouse, Esq.
25. On the Fishes of the Dukhun. By Lieut.-Col. W. H. Sykes, F.R.S.
26. On the Osteology of the *Marsupialia*. By Richard Owen, Esq., F.R.S. &c.

## VOL. III. 1849.

1. Supplement to "A Synopsis of the Fishes of Madeira." By the Rev. R. T. Lowe, M.A.
2. Notes on the Birth of the Giraffe at the Zoological Society's Gardens, and Description of the Foetal Membranes and of some of the natural and morbid appearances observed in the Dissection of the Young Animal. By Richard Owen, Esq., F.R.S. &c.
3. Notice of a fragment of the Femur of a Gigantic Bird of New Zealand. By Richard Owen, Esq., F.R.S. &c.
4. Monograph of the Hollow-horned Ruminants. Part I. By William Ogilby, Esq., M.A.
5. Description of Australian Fish. Part I. By J. Richardson, M.D., F.R.S. Description of Australian Fish. Part II. By John Richardson, M.D., F.R.S. &c., Inspector of Naval Hospitals, Haslar.
6. Observations on the *Stenochoridæ* of New Holland, with Descriptions of new Genera and Species of that family. By the Rev. F. W. Hope, Esq., F.R.S., F.L.S. &c.
7. Description of a new Genus and Species of Sponge (*Euplectella Aspergillum*, O.). By Richard Owen, Esq., F.R.S., F.Z.S. &c.
8. Description of some Coleopterous Insects from Tropical Africa, belonging to the section *Heteromera*. By J. O. Westwood, Esq., F.L.S.

9. Mémoire sur la Famille des Touracos, et Description de deux Espèces nouvelles. Par le Dr. Edouard Rüppell.
10. On *Dinornis*, an extinct genus of Tridactyle Struthious Birds, with Descriptions of portions of the Skeleton of five species which formerly existed in New Zealand. By Professor Owen, M.D., F.R.S., F.Z.S. &c.
11. On the Anatomy of the *Apteryx Australis*, Shaw. Part II. (Myology.) By Professor Owen, F.R.S., F.Z.S. &c.
12. On the Osteology of the *Marsupialia*. (Part II.) Comparison of the Skulls of the Wombats of Continental Australia and of Van Diemen's Land, whereby their specific distinction is established. By Professor Owen, F.R.S., F.Z.S. &c.
13. On *Dinornis* (Part II.): containing Descriptions of portions of the Skull, the Sternum, and other parts of the Skeleton of the species previously determined, with osteological evidences of three additional Species, and of a new Genus, *Palapteryx*. By Prof. Owen, F.R.S., F.Z.S.
14. Observations on the Dodo (*Didus ineptus*, Linn.): an Appendix to the foregoing Memoir on the *Dinornis*. By Prof. Owen, F.R.S., F.Z.S.
15. On a new Genus of the Family *Lophidæ* (les Pectorales Pédiculées, Cuv.) discovered in Madeira. By the Rev. R. T. Lowe, M.A., Corr. Memb. of the Zool. Soc. &c.
16. On *Dinornis* (Part III.): containing a Description of the Skull and Beak of that Genus, and of the same characteristic parts of *Palapteryx*, and of two other Genera of Birds, *Notornis* and *Nestor*: forming part of an extensive series of Ornithic remains discovered by Mr. Walter Mantell, at Waingongoro, North Island of New Zealand. By Professor Owen, F.R.S., F.Z.S. &c.
17. On a new Species of the Genus *Apteryx*. By John Gould, F.R.S., F.L.S. &c.
18. Osteological Contributions to the Natural History of the Chimpanzees (*Troglodytes*, Geoffroy), including the Description of the Skull of a large Species (*Troglodytes Gorilla*, Savage) discovered by Thomas S. Savage, M.D., in the Gaboon country, West Africa. By Professor Owen, F.R.S., F.Z.S. &c.

VOL. IV. PART 1. 1850.

1. On *Dinornis* (Part IV.): containing the restoration of the Feet of that Genus and of *Palapteryx*, with a Description of the Sternum in *Palapteryx* and *Aptornis*. By Professor Owen, F.R.S., F.Z.S. &c.
2. Contributions to the knowledge of the Animal of *Nautilus Pompilius*. By J. Van der Hoeven.

VOL. IV. PART 2. 1852.

3. On the Anatomy of the Indian Rhinoceros (*Rh. unicornis*, L.). By Professor Owen, F.R.S., F.Z.S. &c.
4. On *Dinornis* (Part V.): containing a Description of the Skull and Beak of a large Species of *Dinornis*, of the Cranium of an immature specimen of *Dinornis giganteus* (?), and of Crania of Species of *Palapteryx*. By Professor Owen, F.R.S., F.Z.S. &c.
5. Notice of the Discovery by Mr. Walter Mantell in the Middle Island of New Zealand, of a living specimen of the *Notornis*, a Bird of the Rail family, allied to *Brachypteryx*, and hitherto unknown to Naturalists, except in a Fossil state. By Gideon Algernon Mantell, Esq., LL.D., F.R.S. &c.
6. Remarks on *Notornis Mantellii*. By J. Gould, F.R.S.

## VOL. IV. PART 3. 1853.

7. Osteological Contributions to the Natural History of the Chimpanzees (*Troglodytes*) and Orangs (*Pithecus*). No. IV. Description of the Cranium of an Adult Male Gorilla from the River Danger, West Coast of Africa, indicative of a variety of the Great Chimpanzee (*Troglodytes Gorilla*), with Remarks on the Capacity of the Cranium and other characters shown by sections of the Skull, in the Orangs (*Pithecus*), Chimpanzees (*Troglodytes*), and in different varieties of the Human Race. By Professor Owen, F.R.S., F.Z.S. &c.

## VOL. IV. PART 4. 1857.

8. Osteological Contributions to the Natural History of the Chimpanzees (*Troglodytes*) and Orangs (*Pithecus*). No. V. Comparison of the Lower Jaw and Vertebral Column of the *Troglodytes Gorilla*, *Troglodytes niger*, *Pithecus Satyrus*, and different varieties of the Human Race. By Professor Owen, F.R.S., F.Z.S. &c.
9. On the Anatomy of the Great Anteater (*Myrmecophaga jubata*, Linn.). By Professor Owen, F.R.S., F.Z.S. &c.
10. On *Dinornis* (Part VI.): containing a Description of the Bones of the Leg of *Dinornis (Palapteryx) struthioides* and of *Dinornis gracilis*, Owen. By Professor Owen, F.R.S., F.Z.S. &c.

## VOL. IV. PART 5. 1858.

11. On *Dinornis* (Part VII.): containing a Description of the Bones of the Leg and Foot of *Dinornis elephantopus*, Owen. By Professor Owen, F.R.S., V.P.Z.S. &c.
12. On *Dinornis* (Part VIII.): containing a Description of the Skeleton of the *Dinornis elephantopus*, Owen. By Professor Owen, F.R.S., V.P.Z.S. &c.
13. Osteological Contributions to the Natural History of the Chimpanzees (*Troglodytes*) and Orangs (*Pithecus*). No. III. Characters of the Skull of the Male *Pithecus Morio*, with Remarks on the Varieties of the Male *Pithecus Satyrus*. By Professor Owen, F.R.S., V.P.Z.S. &c.
14. On the Anatomy of the Great Anteater (*Myrmecophaga jubata*, Linn.). Part II. By Professor Owen, F.R.S., V.P.Z.S. &c.

## VOL. IV. PART 6. 1859.

15. Additional Evidence relative to the Dodo. By W. J. Broderip, Esq., F.R.S., L.S., G.S., V.P.Z.S.
16. On some Bones of Birds allied to the Dodo, in the Collection of the Zoological Society of London. By H. E. Strickland, F.G.S.
17. Notice of an original Painting, including a Figure of the Dodo, in the Collection of His Grace the Duke of Northumberland, at Sion House. By W. J. Broderip, Esq., F.R.S., V.P.Z.S. &c.
18. Monograph of the *Strigidae*. By Dr. J. J. Kaup, Director of the Museum at Darmstadt; Corresponding Member.
19. On some New or little-known Species of *Accipitres*, in the Collection of the Norwich Museum. By Philip Lutley Sclater, M.A., F.L.S. &c.
20. Description of a New Species of the Genus *Buteo* from Mexico. By Philip Lutley Sclater, M.A., F.L.S. &c.
21. Description of a New Species of Owl of the Genus *Ciccaba*. By Philip Lutley Sclater, M.A., F.L.S. &c.

## VOL. IV. PART 7. Section I. 1861.

22. On the Osteology of *Balaniceps rex* (Gould). By W. Kitchen Parker, Mem. Micr. Soc.

PHILIP LUTLEY SCLATER,

11, Hanover Square,  
April, 1862.

Secretary.



# ADVERTISEMENTS.

## NEW ORNITHOLOGICAL PERIODICAL.

*Now ready (price 6s. : Annual Subscription £1 : 1s.),*  
Nos. I. II. III. & IV. (*forming Vol. I.*), Nos. V. VI. VII. & VIII.  
(*forming Vol. II.*), Nos. IX. X. XI. & XII. (*forming Vol. III.*),  
*and Nos. XIII. & XIV. of*

## THE IBIS,

A MAGAZINE OF GENERAL ORNITHOLOGY.

EDITED BY

PHILIP LUTLEY SCLATER, M.A., Ph.D., F.R.S.,

FELLOW OF CORPUS CHRISTI COLLEGE, OXFORD,  
SECRETARY OF THE ZOOLOGICAL SOCIETY OF LONDON, F.L.S., ETC.

London: N. TRÜBNER AND Co., 60, Paternoster Row. Paris: FR. KLINCKESIECK,  
11, Rue de Lille. Leipzig: F. A. BROCKHAUS.

---

*Now ready, price £12 : 12s, in one volume, bound in half-morocco,  
containing 50 coloured plates,*

## ZOOLOGICAL SKETCHES

By JOSEPH WOLF.

MADE FOR

THE ZOOLOGICAL SOCIETY OF LONDON,  
FROM ANIMALS IN THEIR VIVARIUM.

EDITED, WITH NOTES,

By PHILIP LUTLEY SCLATER, M.A., Ph.D., F.R.S.,

SECRETARY TO THE SOCIETY.

London: GRAVES AND Co., Pall Mall.

---

*Price 6d., Sewn,*

## A GUIDE TO THE GARDENS

OF THE

ZOOLOGICAL SOCIETY OF LONDON.

Ninth Edition, corrected according to the present Arrangement  
of the Gardens,

By PHILIP LUTLEY SCLATER, M.A., Ph.D., F.R.S.,

SECRETARY TO THE SOCIETY.

ALSO,

*Price 6d., Sewn,*

## HANDBOOK TO THE FISH-HOUSE

IN THE

GARDENS OF THE ZOOLOGICAL SOCIETY  
OF LONDON.

By E. W. H. HOLDSWORTH, F.L.S., F.Z.S. &c. &c. &c.

London: BRADBURY AND EVANS, 11, Bouverie Street; and at the Society's  
Gardens in the Regent's Park.











