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## Gasteracanthides.

## Genus Gasteracantha.

Gasteracantha quadrispinosa, sp. n. (Plate XXVI. fig. 1.)
Adult female: transverse diameter of abdomen, exclusive of the spines, 6 lines; longitudinal diameter $2 \frac{1}{3}$.

Abdomen transverse-oblong; anterior margin curved, the convexity of the curve directed forwards; posterior margin curved to about the same degree, with the convexity of the curve directed backwards. Spines four, not very large, one at each of the four corners of the oblong, those of the anterior corners shortest and weakest, with a slight but distinctly forward direction; the posterior spines rather less in length than the width of that part of the abdomen, and projecting in a line parallel with its transverse axis. Colour yellow-brown, the spines and sigilla (which are of normal number, size, and position) rather darker. Legs short, femora yellowish, the rest dark blackish brown, and (as also are the spines) furnished with short hairs.

The cephalothorax projects but little beyond the fore margin of the abdomen, and is of a deep rich black-brown hue.

This Spider is allied to Gasterucantha malayensis, Sim., and G. mengii, Keys., two species very closely allied to each other, if
not identical ; it is, however, much smaller, and differs both in the length, strength, and direction of the spines as well as in colour.

Hab. Australia,

## Gasteracantha canestrinii, sp. n. (Plate XXVI. fig. 2.)

Female, immature?: longitudinal diameter, exclusive of spines, scarcely 2 lines, transverse diameter $2 \frac{1}{2}$.

Spines four, one at each end of the abdomen, the fore and hind outlines of which they carry on to sharp points. These two lateral spines are larger, and very much stronger than the other two, which are at the posterior extremity of the abdomen, and their points a little divergent from each other.

The abdomen is of a dull blackish-brown hue; the sigilla normal in size, number, and position, and slightly tinged with reddish brown.

The cephalothorax is large, but of normal form ; its colour, as well as that of the falces, legs, palpi, and abdominal spines, is a dull brownish yellow.

From its only known near allies (G. quadridens, C. L. Koch, and $\boldsymbol{G}$. pallida ejusd.) it may be known at once by the much greater length and strength of the two lateral spines.

A single example (received through Frederick Bond, Esq.) from Antigua.

Gasteracantha rimata, sp. in. (Plate XXVI. fig. 3.)
Length of the transverse diameter of an immature female, exclusive of the spines, $2 \frac{1}{3}$ lines, that of the longitudinal diameter being $1 \frac{1}{3}$ line.
This Spider is allied to Gasteracantha geminata, C. L. Koch, but may be distinguished at once by the two lateral spines (on each side) being of different lengths, and diverging from each other ; the posterior (or intermediate) spine is the longest and strongest.

In G. geminata the lateral spines adhere to each other for some distance, until the sharpening off of the points begins; they are also of equal size, and the anterior spine scarcely differs from the other in length. The posterior spines in the present Spider are also proportionally stronger.

Several examples, all immature, were received from Ceylon among numerous other Spiders kindly sent to me by Mr. G. H. K. Thwaites.

Gasteracantha pavesi, n. sp. (Plate XXVI. fig. 4.)
Length of the transverse diameter of the adult female, exclusive of the spines, 7 lines; longitudinal diameter 4 lines.

There will be no difficulty in distinguishing this Spider from all others known to me; it forms, in fact, the type of quite a new group, whose characteristics are the wide separation between the anterior and intermediate spines, and the close proximity of the latter to the posterior ones, which last are also most abnormally separated. The anterior spines are small, directed straight forwards from the central portion of the very convex fore margin of the abdomen, the interval
separating these being about equal to the width of the cephalothorax. The intermediate spines are of moderate length, stout, but very slightly tapering, and directed a little backwards; not far behind each of these is one of the posterior spines, which are very small and of a sharp-pointed conical form, and directed more outwards than backwards.

The abdomen is of a dark yellowish brown hue, the sigilla and spines deep red-brown. The sigilla on the posterior margin are abnormal, being 10 in number instead of the usual number 9 -three large on each side, with four small ones between : those on the anterior margin appeared to be normal in number (i.e. 10); but, owing to the injured state of that part of the abdomen, I cannot speak positively on the point. The cephalothorax is dull black, clothed with coarse, dull, greyish yellow pubescence; and the legs dark reddish brown, clothed with hairs of a dull greyish yellow hue.

Hab. Laos.

## Gasteracantha frontata, (Plate XXVI. fig. 5.)

Gasteracantha frontata, Blackw. Ann. \& Mag. N. H. ser. 3, vol. xiv. p. 40.

Length of the transverse diameter of the adult female, exclusive of the spines, $5 \frac{2}{3}$ lines; longitudinal diameter nearly $2 \frac{1}{2}$ lines.

This Spider is another species of the "fornicata" group, but may be distinguished at once by the shortness and stoutness of the intertermediate spines, which are very slightly directed backwards. The colour of the cephalothorax and legs is deep brown, the abdomen yellow, with, in some examples, a narrow, transverse, blackish bar connecting the anterior and two of the central sigilla; the part of the abdomen from which the posterior spines spring is dark yellowbrown, with a roundish yellow central blotch ; the underside is deep brown, spotted with good-sized and distinct yellow spots; the spines and sigilla are reddish brown.

The figure is drawn from the type specimen described by $\mathrm{Mr}_{\text {a }}$ Blackwall (l. c.).

Hab. East Indies.

## Gasteracantha peccans, sp. n. (Plate XXVI. fig. 6.)

Adult female: length of the transverse diameter, exclusive of the spines, $4 \frac{1}{2}$ lines; longitudinal diameter rather over $2 \frac{1}{2}$ lines.

In the general form of the abdomen this Spider is much like $G$. madagascariensis, Vins.; but it differs totally in colours and markings; and the intermediate spines are shorter, much stronger, and straight; they taper also to a sharp point, not by a straight but by a curvilinear convex outline ; the posterior spines also are shorter, and those of the anterior pair are almost rudimentary; the intermediate spines are directed a little backwards. The upperside of the abdomen is yellow tinged with brown, the two exterior sigilla at each end of the posterior row of 8 are surrounded with a blackish patch touching the abdominal margin; the two hinder sigilla also of the central four are each similarly encircled. The underside of the abdomen is black-
brown, marked and spotted with yellow. The sigilla are all redbrown, very small, especially the anterior ones, which are 10 in number. The cephalothorax is black, and the legs are black-brown.

Hab. Mauritius. (Received from R. H. Meade, Esq., of Bradford.) Possibly this is Gasteracantha (Plectana) mauricia, Walch.

Gasteracan tha callida, sp. n. (Plate XXVI. fig. 7.)
Length of the transverse diameter of the adult female, exclusive of the spines, $5 \frac{2}{3}$ lines; length of the longitudinal diameter 3 lines.

This is another species of the "fornicata" group: the anterior margin of the abdomen between the two foremost spines forms a nearly even curve; the foremost spines are short and very slightly (in one example not at all) directed forwards. The intermediate spines are stout, scarcely curved, double the length of the anteriors, rapidly tapering from base to point, and but slightly directed backwards. The posterior spines are as long, but not so strong, as the intermediate ones; in one example, however, the posterior spines were shorter.

The cephalothorax is black, the legs black-brown, and the abdomen yellow-brown, the spines reddish brown, and the sigilla small and like the spines in colour. The different form of the fore margin of the abdomen and the stouter intermediate spines will at once distinguish this Spider from the next species, G. flebilis.

## Hab. Trinidad.

Gasteracantha flebilis, sp. n. (Plate XXVI. fig. 8.)
Length of the transverse diameter of the female (adult?), exclusive of the spines, 4 lines; longitudinal diameter slightly over 2 lines.

This spider is allied to $\bar{G}$. fornicata, C. L. Koch; it is, however, much smaller ; and though it may possibly be an immature example of that species, I am inclined to think it is distinct. Owing to the specimen being pinned and dry, I am unable to say positively whether it is adult or not; but I think it is. The anterior spines are short and directed a little forwards; the intermediate ones stout, not very tapering, double the length of the anterior, and with a distinctly backward direction. The cephalothorax, falces, and legs are deep brown-black; the abdomen dull brown, with two transverse black bands, of which the anterior is the broadest : the posterior band appeared to be interrupted in the middle; but as the pin had passed through that point, this is not certain ; the spines are red-brown.
Hab. Sarawak.

## Gasteracantha harpax, sp. n. (Plate XXVI. fig. 9.)

Length of the transverse diameter of the adult female, exclusive of the spines, rather over $5 \frac{1}{2}$ lines; length of longitudinal diameter rather more than 3 lines.

This Spider is also of the "fornicata" group. It may be easily known by the weakness of the intermediate spines, which are scarcely double the length of the anteriors, and no stronger, if, indeed, quite so strong, and project at right angles to the longitudinal axis of the
abdomen. The anterior spines are directed slightly forwards; and the posterior are a little longer and stronger.

The cephalothorax is of a deep brownish black colour; that of the legs dark brown, and the abdomen dull yellowish brown; the spines and sigilla (which are of normal number and form) red-brown.

Hab. Sarawak.
Gasteracantha madagascariensis. (Plate XXVI. fig. 10.)
Gasteracantha madagascariensis, Vins. Aran. des Iles de la Réunion, Maurice et Madagascar, p. 242, pl. ix. fig. 6.)

From a careful examination of a series of examples received from Madagascar, I can detect no difference in the form of the abdomen, nor in the relative length, strength, or direction of the intermediate spines. It is a much smaller Spider than G. formosa, Vins., and quite distinct in its colours and markings. The figure ( 10, Plate XXVI.) is from one of the examples mentioned above. There appears to be considerable variety in the extent and continuity of the black markings on the abdomen.

Gasteracantha formosa. (Plate XXVI. fig. 11.)
Gasteracantha formosa, Vins. Aranéid. des Iles de la Réunion, Maurice et Madagascar, p. 244, pl. ix. fig. 7.
G. petersii, Karsch, Monatsb. k. Akad. Wiss. Berlin, 1878, p. 322, pl. 1. fig. 6: Mozambique.
G. milvoides, Butler, Trans. Ent. Soc. Lond. May 1873, p. 159, pl. iv. fig. 2: South Africa.
G. transversa ?, C. L. Koch, Die Arachn. iv. p. 14, pl. cxiii. fig. 259 : hab.?
G. varians, Cámbr. MS. 1876: Madagascar.
G. frontata, Bl. Ann. \& Mag. N. H. Dec. 1866, p. 463 : S.E. Africa. Non G. frontata suprà.

I feel but little doubt that all the Spiders included under the above synonyms are identical-although the difference in the relative length, strength, and direction of the large lateral (or intermediate) spines is not inconsiderable, and the proportional length and breadth of the abdomen (exclusive of the spines) also differ.

Out of eight examples (included under G. varians, Cambr.) received from the same locality in Madagascar, no two are exactly alike in the points above mentioned, though all are undoubtedly of the same species; the variations of the different examples run into each other, so as to defy any attempt to characterize them as distinctive of species. The typical form of G. formosa, Vins., is present among these eight examples, of which I have figured three of the varieties most widely separated from the typical form. In fig. 11 the large lateral spines are not only stronger than those of the typical $G$. formosa, but their curre and direction are exactly opposite. In fig. $11 a$ the spines are straight, and project at right angles to the longitudinal axis of the abdomen, one of them being much stronger and of a different form from the other; in fig. $11 b$ we have a nearer approach to the typical formosa.

Fig. $11 c$ is almost exactly identical with the type; it is from one of the examples included by Mr. Blackwall, l.c., in his list of S.E. African Spiders as G. frontata, Bl., from which it is clearly distinct (vide $G$. frontata, Bl., anted, p. 283). An example from E. Africa (in my collection) is intermediate between the last-mentioned one and the figure given (l.c.) by Karsch of G. petersii, in which the only difference is the (apparently) stouter and more curved intermediate spines, and the less narrow abdomen. My example differs from my fig. 11 in being less narrow, but still not quite so broad, proportionally, from back to front as represented in Karsch's figure. I have also another example, from the Zambesi river, in which the abdomen is narrowest of all, and the length of the intermediate spines exceeds that of all the other examples and figures I have yet seen, their strength and direction being those of the typical G. formosa. This example comes perhaps the nearest to $G$. milvoides, Butl.

The locality of G. transversa, C. L. Koch, is not given by that author; but I should strongly suspect it to be African, especially as it is figured with transverse pale bands across the abdomen, which, in well-preserved examples of $G$. formosa, Vins., are well marked and characteristic.

It is possible that G. fornicata, C. L. Koch, may be of this same species; but as it comes from a widely distant locality (Java), it is safer at present to conclude it to be distinct. At any rate, never having seen an example from Java, I am unable myself to give any opinion upon it.

I have hesitated to include $G$. nana, Butl., among the synonyms of G. formosa, Vins., though it would not surprise me if it should some day be found to be identical.

Gasteracantha mportuna, sp. n.? (Plate XXVII. fig. 12.)
Length of the transverse diameter of an adult female, exclusive of the spines, 6 lines; length of the longitudinal diameter 3 lines.

In this Spider the large lateral spines are not quite so long as in the last; but they are stronger, straighter, and have a more backward direction. The colours are like those of that species; but the example described is in a similarly bad state of preservation so far as colours are concerned. The extremities of the large spines have a strong steel-blue metallic hue.

It is only with great hesitation that I have described this Spider as distinct from G. molesta. I should not be at all surprised at a series of examples from the same locality some day proving it to be identical with that Spider, and possibly also with G. formosa, Vins.

Hab. West coast of Africa.
Gasteracantha molesta, sp. n. (Plate XXVII. fig. 13.)
Length of the transverse diameter of an adult female, exclusive of the spines, $7 \frac{1}{2}$ lines; length of the longitudinal diameter a little over 3 lines.

This Spider is evidently allied closely to $G$. formosa, Vins.; but the large lateral spines are much less tapering than in any of the
varieties I have seen of that species; and as it comes from the opposite side of Africa, I am induced to describe it as a distinct species.

The sigilla are rather large and of a deep reddish brown hue, as are also the spines, the cephalothorax, and legs, the falces being darker. The colouring of the abdomen generally has entirely disappeared, from the bad state of preservation of the only example in my possession.

Hab. West coast of Africa.
Gasteracantha crepidophora, sp. n. (Plate XXVII. fig. 14.)
Length of the transperse diameter of the adult female, inclusive of the spines, $7 \frac{1}{2}$ lines; longitudinal diameter, exclusive of spines, 3 lines.

The remarkable form of the intermediate spines, that of a boot with a sharp toe, will serve to distinguish this curious Spider from all others of the genus known to me.

The anterior spines are well removed from the intermediate ones, rather small, and not very strong, being similar in length but not quite so strong as the posterior ones. The intermediate spines are very strong, rather long, bent ; and near the extremity the curved point goes off nearly at right angles, forming a large roundish heel; the point forms the foot; and the whole bears a very exact resemblance to a boot.

The cephalothorax is black-brown; the legs are dull brown, the femora being the lightest-coloured. 'The abdomen is of a somewhat subpentagonal form, and of a slightly brownish yellow colour, with a broad marginal black band on each side in front, including the anterior spines and four of the front sigilla; the intermediate spines are orange-coloured on their basal half, the rest being black with a slight reflection of steel-blue; the posterior spines are black. The anterior sigilla are normal in number, 10 ; the posterior ones only 8 two larger ones on each side, with four minute ones between them. All are rather small, and of a black colour.

This Spider appears to form the type of a very distinct group of the genus.

Hab. Dorey, New Guinea.
Gasteracantha helva. (Plate XXVII. fig. 10.)
Gasteracantha helva, Bl. Ann. \& Mag. N. H. ser. 3, vol. xiv. p. 42.

Adult female: length of the transverse diameter at the widest point, exclusive of the spines, rather over 3 lines; longitudinal diameter rather more than $2 \frac{1}{2}$ lines.

The abdomen is of a subpentagonal form; the intermediate (or longest) spines are placed at the exterior angles of the hinder part of the abdomen; they are moderately long, strong, rapidly tapering to a sharp point beginning a little way from their extremity and directed strongly outwards and a little backwards; these spines are of a deep, rich, shining steel-blue colcur. The posterior ones are shorter and much less strong, rather nearer to each other than each is to the
intermediate spine on its side, and a little divergent from each other. The anterior spines are the shortest and weakest; and each divides the outer side of the abdomen pretty exactly. The anterior and posterior spines have a browner hue than the other two ; and all have a longitudinal yellow stripe underneath.

The abdomen is of a yellow, or yellow-brownish, colour on the upperside. The sigillz are small; those on the anterior margin are normal in number, 10, but those on the hinder part are 8 only. The underside is black, spotted and reticulated with yellow.

The cephalothorax is dark brown, thinly clothed with fine hoary hairs. The legs are dull yellowish brown, obscurely marked and annulated with a deeper hue.

This Spider is not, I think, identical either with $G$. lepelletieri, Guérin \& Walck., or with Plectuna pretextata, Dol., as surmised by Mr. Butler, Trans. Ent. Soc. Lond. May 1873, pp. 155 \& 172. The proportions of the length and breadth of the abdomen of the former are quite different; and, judging from examples in my possession of the latter (from Amboina and Sumatra), the form of the intermediate spines is distinct.

Gasteracantha helva, Bl., has never before been figured; so that the figure given here, from Mr. Blackwall's type specimens in my possession, will perhaps be of assistance to arachnologists in the determination of the species.

Hab. East Indies.

## Gasteracantha propinqua, sp. n. (Plate XXVII. fig. 16.)

Adult female: length of the widest transverse diameter, exclusive of the spines, nearly 4 lines; longitudinal diameter $2 \frac{3}{4}$ lines.

This species is nearly allied both to Gasteracantha blackwalli, Keys. (Madagascar), and G. sororna, Butl. (Madras), but differs in several material respects from both. Among other differences, the anterior spines in the former are placed further forwards, and the posterior spines in the latter are considerably shorter.

The cephalothorax is brown-black, with a yellow-brown patch on each side of the four central eyes; and is clothed sparingly with coarse hoary hairs. The legs are brownish yellow; the tibiæ, tarsi, and metatarsi darkest, and (apparently) with still darker markings. The abdomen is subtriangular, hollow-truncate in front; it is of a clear yellow-brown hue, the spines deep black-brown with steel-blue (but not very strong) metallic reflections. The sigilla are small, 10 on the fore margin, and 8 on the hinder margin; the two central ones of these last are very minute and close together. The anterior spines are the shortest and weakest, and each, as nearly as possible, equally divides the side on which it is placed; the intermediate ones are long, strong, equal to the side of the abdomen in length, almost equally tapering throughout, and project outwards and a little backwards; the posterior spines are long, but nut so long as the intermediate ones, and very much less strong, but much longer and stronger than the anteriors, and divergent. The underside of
the abdomen is deep blackish brown, marked and spotted with yellow.

Hab. Cambodia.
Gasteracantha claveata, sp. n. (Plate XXVII. fig. 17.)
This Spider is closely allied to Gasteracantha (Plectana) clavatrix, Walck., resembling it nearly in size and in the curious enlargement at the extremities of the intermediate spines; but the greater length and rather more slender shaft, and the still more club-like form of the bulbous termination of these spines in the present Spider, lead me to believe it to be of a distinct species.

In four examples before me of $G$. clavatrix, the upperside of the abdomen has a distinct, but irregular, narrow, submarginal, black band or stripe from the intermediate spines to the fore extremity, including the sigilla; I can detect no trace of this band in the present Spider. The sigilla are small, 10 in front and 8 behind, and of a red-brown hue, both the upper and under surface of the abdomen being of a uniform brownish clay-colour (though no doubt much faded by the drying of the specimen).

Hab. Celebes.
Gasteracantha simoni, sp. n. (Plate XXVII. fig. 18.)
Length of the transverse diameter of the adult female, exclusive of the spines, 4 lines; longitudinal diameter $2 \frac{2}{3}$ lines.

This Spider is nearly allied to Gasteracantha crucigera, Bradley, but differs in its markings as well as in the length and strength of its spines.

The abdomen is of a subpentagonal form, almost subtriangular, truncated at the apex. The intermediate spines are moderately long, strong, very slightly curved and a very little directed backwards, and placed at each corner of the hinder part of the abdomen; close in front of each is one of the anterior spines; these are very minute, but about the same size as the posterior ones. The colour of the abdomen is yellow; the sigilla are normal in number, of a deep redbrown colour, and the posterior pair of the four central ones are the largest ; this is quite abnormal so far as I am aware. The spines are rich deep red-brown. The underside of the abdomen is yellowish, rugulose, thickly studded with very small reddish-brown circular tubercles, and also somewhat clouded with brown.

The cephalothorax is dark reddish brown, clothed with short, grey, adpressed hairs.

The legs are yellow-brown, lightest on the undersides of the femora; the tibix and metatarsi are darkest, a small part of the basal portion of the metatarsi and tarsi being yellow, giving a somewhat annulated appearance to those joints.

Hab. Cape York.
Gasteracantha acrosomoides, sp. n. (Plate XXVII. fig. 19.)
Length of the greatest transverse diameter of the adult female, Proc. Zool. Soc.-1879, No. XIX.
exclusive of the spines, rather over $4 \frac{1}{2}$ lines; longitudinal diameter $2 \frac{2}{3}$ lines.

This Spider is of a more decidedly subtriangular form than $G$. simoni-the anterior side, where the apex of the triangle is truncated, being of the same width only as the cephalothorax. The intermediate spines issue from the corners of the hinder part of the abdomen, at each posterior angle of the triangle ; they are strong, but not very long, and are very slightly directed backwards; the anterior spines are very small, close in front of the internediate ones, but not contiguous, and have very nearly the same direction. The posterior spines are quite rudimentary, being represented by two minute, but quite distinct, conical tubercles. The abdomen is yellow, with some dusky blackish patches along the outer margins, in frout of, and including the anterior spines, as well as the sigilla on those parts. The sigilla are of a deep red-brown colour; the anterior ones are normal in number, 10 ; the posterior ones 8 only. The underside is dusky blackish, studded with very minute red-brown tubercles, and marked with a few yellow blotches.

The sternum is orange-yellow, bordered with red-brown.
The cephalothorax is pale reddish yellow-brown, the upper part of the caput being deep red-brown, the whole clothed with fine grey adpressed hairs. The legs are dark brown.

The similarity between the form of this Spider and that of some species of the genus Acrosoma is remarkably close; but the form of the cephalothorax, as well as the number and position of the spines on the abdomen, shows its true generic affinity.

Nine examples were received, some time ago, through Mr. W. Cutter, from Madagascar.

Gasteracantha wealii, sp. n. (Plate XXVII. fig. 20.)
Length of the transverse diameter of an immature female (including the spines) 2 lines; longitudinal diameter (exclusive of spines) $1 \frac{1}{4}$ line.

The whole of this Spider is of a dull greenish olive yellow-brown hue, with a small yellowish spot on the middle of the fore margin of the abdomen; the cephalothorax and legs are paler than the abdomen, the legs showing faint traces of darker annulations. The caput is not elevated into a distinct conical prominence on the upperside, though there is a tolerably well-marked longitudinal cleft or furrow along its centre, leaving a slight eminence on either side of the central line. The spines are short, scarcely differing in length, and mammose, i.e. are formed by a uniform and gradual enlargement of the abdomen at the points where they spring, ending in a sharp point, but are not of the distinctly inverted nail-form like those of a New-Ireland species (G. pentagona, L. Koch) and some others.

The sigilla are small, tinged with red-brown, but indistinct; they are 8 in front, 2 at each end, 7 behind, and 4 in the centre.

The only example I have seen was contained among some Spiders sent to me, from Caffraria, by Mr. J. Mansel Weale, and is apparently of a very distinct and undescribed species.

Gasteracantha observatrix, sp.n. (Plate XXVII. fig. 21.)
Length of the transverse diameter of an adult female, exclusive of the spines, $4 \frac{1}{4}$ lines; length of longitudinal diameter rather more than $2 \frac{1}{2}$ lines.

This Spider belongs to the G. mammosa, C. L. Koch, group ; the spines are small, the intermediate and posterior ones being of the same length, and issuing from large circular prominences of the abdomen, which may, however, be really taken to form part of the spine itself.

The cephalothorax rises to a single undivided, blunt, conical eminence on the middle of the caput; its colour is reddish yellowbrown, darkest on the sides and thorax, and clothed thinly with grey hairs, of which some form a marginal band.
The legs are dull yellow, marked and irregularly annulated with reddish brown.

The abdomen is yellow-brown, clothed with grey hairs, and marked and marbled on the upperside with clearer yellow patches of different sizes, forming roughly an anterior curved band and a central large cruciform marking. The sigilla are normal in number ( 10 in front and 9 behind); but the four centrals of the front row are as large, or nearly so, as any of the rest; in fact the two fore centrals are the largest of all. Along the central longitudinal line are some small supernumerary sigilla.

Examples of this Spider, which is allied to G. roseolimbata, Dol., and G. canningensis, Stol, were received from the Pratos Reef in the China seas, where they were taken by Dr. C. Collingwood, M.D., and kindly sent to me, some years ago.

## Gasteracantha proba, sp. n. (Plate XXVII. fig. 22.)

This Spider is of a quadrate form, a little narrower behind, and with the posterior outline somewhat curved, and is allied to, but, I think, distinct from, G. cicatricosa, C. L. Koch. In the adult female the length of the longest transverse diameter (which is at the fore margin) is $3 \frac{1}{2}$ to 4 lines; longitudinal diameter $2 \frac{3}{4}$ to 3 lines. The abdominal eminences on which the spines are placed are small. The spines are very small, sharp-conical, and scarcely differ in size; the anterior ones are placed, one at each extremity of the fore margin (which is but very slightly curved); they are slightly the smallest, and are directed a little forwards; the intermediate spines are a little directed backwards, and about equally divide the space between the anterior and posterior ones; but as the hinder division of the abdomen, on which the latter are placed, is more liable to shrink in preservation than the rest, the interval between the intermediate and posterior spines is sometimes less than that between the former and the anterior ones.

The cephalothorax is less raised at the caput than in most other species of the genus; the caput also, instead of being elevated in the middle, has a longitudinal furrow along that part; its colour varies from brownish yellow to dark blackish brown; and it is clothed with short grey hairs.

The legs are very short, strong, and yellow, marked or roughly annulated with black-brown.

The abdomen is mottled and marbled aoove with black and pale yellowish; the sigilla form most of the dark portions; and the rest is intersected with black veiny lines and markings, leaving, however, in some examples a tolerably distinct, large, yellow, crucitorm marking extending over the whole of the upperside. The figure is taken from one of the examples in which this was most distinctly marked; the underside is blackish, spotted thickly with yellow spots and markings.

Hab. Caffraria, where it was taken by Mr. J. Mansel Weale, who kindly sent it to me, with other Spiders.

Gasteracantha rogersi, sp. n. (Plate XXVII. fig. 23.)
Length of the transverse diameter of the adult male $1 \frac{1}{3}$ line; longitudinal diameter 1 line.

This is, to me, a most interesting Spider, being the only male I have ever seen in the now numerously represented genus Gasteracantha; it is also, I believe, the second ever yet described; and it bears out a remark I formerly made with respect to the probable size and look of the males of this group.

The abdomen of the present Spider is of a nearly square form, with the corners rounded off and the anterior margin somewhat hollowed; its colour is a deep blackish brown, deeply covered with very minute pock-marks or round punctures, and a few short, somewhat spinelike, coarse, grey hairs. The spines are four in number, rudimentary, though quite visible, no trace, however, being discernible of any corresponding to the usual intermediate ones; those present are, one at each of the rounded fore corners, and two behind in the ordinary position of the posterior ones. The sigilla are 24 in number, of tolerable size, though rather indistinct, being merely rather darker than the rest of the abdominal surface, the middle of which is somewhat more convex than the sides; 20 of the sigilla form a marginal line round the whole of the abdomen ; the rest form a central quadrangular figure.

The cephalothorax is large; the caput is elevated in a generally convex form, with but the very slightest longitudinal central indentation; it is also very strongly constricted behind the eyes on each side; its colour is like that of the abdomen; and it is covered with short coarse grey hairs.

The legs are short, strong, tapering towards their extremities, of a deep brown colour, the posterior half of each of the tarsi and metatarsi being of a yellowish colour, the anterior portion yellow-brown. They are clothed with greyish hairs; and there are a few spines beneath the tibiæ of the first and second pairs.

The palpi are short ; the digital joint very large, of a somewhat oval form, and with the palpal organs (which are quite simple in structure, with a prominent process at their base on the outer side) form a very large club-like mass; the radial joint is very short, and prominent on the outer side; the cubital joint is also very short.

The example above described was contained in a small collection
of Spiders made for me on the river Coanza (W. Africa) several years ago by Mr. Henry Rogers, of Freshwater, Isle of Wight. I am not aware of any described female Gasteracantha of which it may possibly be the male. It is not unlikely that the female may have the usual six abdominal spines; and it probably belongs to the group Isacantha, Simon ${ }^{1}$.

## Genus Paraplectana, Capello.

Paraplectana thorntoni. (Plate XXVII. fig. 24.)
Eurysoma thorntoni, Blackw. Ann. \& Mag. N. H. Nov. 1865, p. 348.

No figure has ever yet been published of this large and beautiful Spider; I have therefore great pleasure in being now able to give one of it, taken from the type specimen from which Mr. Blackwall's description was made.

That description, in its exactness, leaves nothing to be desired; it need, therefore, only be added here, that the jet-black ground-colour of the abdomen, with its somewhat raised, large and conspicuous bright-yellow markings, and yellow cephalothorax, render it one of the most striking and handsome known Spiders of this family.

An immature example (also a female) was received from Mr . Mansel Weale among the other Spiders collected by him in Caffraria.

List of Spiders described above, with reference to pages, Plates, figures, and localities.
Gasteracantha quadrispinosa, sp. n., p. 281, PI. XXVI. fig. 1. Australia.
—canestriniì, sp. n., p. 282, Pl. XXVI. fig. 2. Antigua.
-_rimata, sp. n., p. 282, PL. XXVI. fig. 3. Ceylon.

- pavesi, sp. n., p. 282, P1. XXVI. fig. 4. Laos.
- frontata, Bl., p. 283, Pl. XXVI. fig. 5. East Indies.
- peccans, sp. n., p. 283, Pl. XXVI. fig. 6. Mauritius.
——callida, sp. n., p. 284, Pl. XXVI. fig. 7. Trinidad.
- febilis, sp. n., p. 284, Pl. XXVI. fig. 8. Saramak.
- harpax, sp. n., p. 284, Pl. XXVI. fig. 9. Sarawak.
——madagascariensis, Vins., p. 285, PI. XXVI. fig. 10. Madagascar.
——formosa, Vins., p. 285, Pl. XXVI. fig. 11. Madagascar; S. \&E. Africa.
- importuna, sp. n., p. 286, Pl. XXVII. fig. 12. W. coast of Africa.
- molesta, sp. n., p. 286, Pl. XXVII. fig. 13. W. coast of Africa.
-crepidophora, sp. n., p. 287, Pl. XXVII. fig. 14. Dorey, New Guinea.
—helva, Blackw., p. 287, Pl. XXVII. fig. 15. East Indies.
—— propinqua, sp. n., p. 288, PI. XXVII. fig. 16. Cambodia.
__claveata, sp. n., p. 289, Pl. XXVII. fig. 17. Celebes.
——simoni, sp. n., p. 289, Pl. XXVII. fig. 18. Cape York.
-acrosomoides, sp. n., p. 289, Pl. XXVII. fig. 19. Madagascar.
——weali, sp. n., p. 290, Pl. XXVII. fig. 20. Caffraria.
——observatrix, sp. n...p. 291, Pl. XXVII. fig. 21. Pratos Reef, Chinese Sea.
- proba, sp. n., p. 291, Pl. XXVII. fig. 22. Caffraria.
- rogersi, sp. n., p. 292, Pl. XXVII. fig. 23. River Coanza.

Paraplectana thorntoni, Blackw., p. 293, P1. XXVII. fig. 24. Zambesi River.

[^0]March 18, 1879.

Prof. St. George Mivart, F.R.S., V.P., in the Chair.

The Secretary called attention to some Japanese Deer (Cervus sika) lately presented to the Society by Viscount Powerscourt.

These Deer were from the herd of Japanese Deer belonging to Lord Powerscourt, at Powerscourt, in Wicklow, Ireland, which had been originally commenced in 1859 with three hinds and a stag of Cervus sika, purchased of a London dealer. These animals had thriven well and multiplied exceedingly ; and the herd now consisted of at least eighty individuals. Lord Powerscourt had at various times supplied stock from it to the following Deer-parks:-

1. That of Earl Annesley, Castle Wellan, co. Down.
2. That of Sir Victor Brooke, Colebrooke, Fermanagh.
3. That of Sir Croker Barrington, Bt., Glenstal, Limerick.
4. That of the Earl of Ilchester, Melbury, Dorset.
5. That of Lord William Osborne, Tally-allan, Scotland.

The following extracts from a letter recently addressed to the Secretary by Viscount Powerscourt on this subject were read :-
"There are certainly more than eighty Japanese Deer in the parks here now. It is very difficult to count them accurately, as there is so much wood; but I saw sixty-five in one lot together one day last autumn. I know that that was not the whole lot, because there were little lots scattered about besides. There are certainly eighty, if not more. Japanese Deer require no care of any kind; they are as hardy as Fallow or Red Deer; and the venison is as good: we had a haunch last year with more than two inches of fat on it. The haunches are small and of a handy size, about the size of mutton. Japanese Deer rut at the same time as the Fallow Deer. They are certainly not less hardy than Fallow Deer, I think more so. They have a very thick coat in winter ; and I often see them up on the high ground when the Fallow Deer are in the shelter. The bucks are quite black in winter, and only show their spots very little; the old ones do not show them at all. Like all Deer, the young ones are spotted, and the spots get fainter as the animal gets older; the old does as well as the old bucks almost lose them; the old bucks lose them altogether. They make two noises when rutting-one a sort of scream, the other a prolonged whistle, just like a man calling another at a distance; till I knew what it was, I was several times almost sure it was some oue looking for me when I was shooting in the park. Their beauty is unquestionable; and when they are startled, and spread out the white long hairs on their haunches like a target as they jump away, they are very graceful."

The following papers were read:-

1. On a new Species of Barn-owl from the Island of Viti-

Levu. By Dr. G. Hartlaub, F.M.Z.S.
[Received March 3, 1879.]
Mr. S. Cæsar Godeffroy, of Hamburg, has received of late by means of one of his collectors, Mr. Kleinschmidt, a fine adult pair of a Barn-owl, which had been shot by a Mr. Storck on the banks of Wai-manu, a confluent of the Rewa river, in the island of Viti Levu. These birds having been confided to my examination by Mr. D. Schmeltz, the well-known Curator of the Museum Godeffroy, the first thing I did was to compare them most carefully with certain other Australian and Oceanic species, with which I thought they might possibly coincide, viz. a fine series of the Lulu Owl (Strix delicatula) from different localities (Continental Australia, Tonga, Viti, Samoa group, \&c.), as also with examples of Strix personata, and Strix castanops.

But the new Owl has nothing whatever to do with any of these species. I am, on the contrary, fully convinced of its being undescribed; and I propose to name it after the able and zealous curator of the ornithological department of the Paris Museum.

Strix oustaleti, n. sp.
Mas supra in fundo ochraceo-fulvo umbrino-fuscus, maculis minutis albidis, obscure circumdatis, irregulariter longitudinalibus rarius notatus; disco in fundo albido rufescente lavato, intense fusco-rufescente cincto, macula anteoculari fusco-nigricante; subtus late ochraceo-fulvus, maculis rarioribus subrotundatis vel subtrianguluribus nigricantibus; hypochondriorum maculis nullo modo diversis; abdomine imo, cruribus crissoque immaculatis albidis, subcaudalibus concoloribus, albido-fulvescentibus, apicem versus maculis nonnullis parum distinctis; tarsi dimidio superiore rarius plumoso, pallide rufescente, inferiore subnudo; tectricibus alarum minoribus interscapulio concoloribus; remigibus primariis, eorum tectricibus scapularibusque ex parte dilute rufes-centi-fulvis, fasciis quatuor angustioribus apicibusque largius ni-gricanti-fuscis, pogonio externo prope marginem fusco vermiculato, interno marginem versus sensim albicante, fasciis incompletis; scapularibus dorso proximis ad apices late fuscis, vix vermiculatis maculaque parva apicali alba; subalaribus albis, ex parte rufescentibus, maculis subrotundatis, nigro-fuscis; rectricibus dilute ochraceo-fulvis, fasciis 3-4 angustis nigricantibus; interstitiis sicut in remigibus non vermiculatis, apicibus albido fuscoque variis; rostro corneo-albido; pedibus pallidis, unguibus corneo-ccerulescentibus.
Long. tot. circa 37 cent., al. 33 cent., caud. 13 cent., tars. 81 mill., culm. 38 mill., dig. med. (ung. excl.) 35 mill.
Fœm. minor, obsoletius tincta, pallidior; notai maculis minoribus et minus distinctis, gastrei pro mole majoribus; subalaribus purius albis.
Long. tot. circa 35 cent., al. 31 cent., tarsi 29 mill.

The common Barn-owl of the Viti Islands is Strix delicatula, a species so totally different that it is unnecessary to enter more fully upon these differences. Suffice it to remark that the wings and the tarsi are much longer in our new species. This latter comes somewhat nearer to the light phase of Strix nove hollandice (sive personata). But that is altogether a stouter bird, the feet and beak being much stronger than in Strix oustaleti, whereas the tarsi and the wings are proportionally longer in the new species. Strix nova hollandice has the whole tarsi feathered with a thick white down; in Strix oustaleti the lower half of the tarsus is almost naked, and the upper very thinly feathered.

There are also many and very striking differences in the colours of the two birds. The minute whitish vermiculation on the upper parts of Strix nove hollandice is entirely wanting in Strix oustaleti. The spots on the sides of the abdomen are more or less enlarged and bar-like in Strix nove hollandic; they are of the same size and form as those on the breast and epigastrium in Strix oustaleti. The number of the dark bands in the primaries and the tail-feathers is six in Strix nove hollandia, four in Strix oustaleti. The colours of the tail-feathers are very different in the two birds, the interstices being thickly mottled with brown and whitish in Strix novee hollandie, fulvous and without any markings in Strix oustaleti. The apical part of the greater remiges is broadly mottled with whitish and brown in Strix nove hollandice, whereas it is of a uniform dark blackish brown in Strix oustaleti.

The existence of two species of Barn-owls in so small an island as Viti-Levu is a curious fact.

The type specimens of this description are and will remain in the Museum Godeffroy at Hamburg.

2. On Female Deer with Antlers. By Edward R. Alston, F.L.S., F.Z.S., \&c.

[Received March 4, 1879.]
The occasional abnormal development of antlers in female Deer (outside the genus Rangifer) presents some points of interest, as bearing on the arrangement of the family Cervida, and on the probable evolutionary history of these weapons.

My attention has been lately turned to this subject by the record of such an instance in the Ruedeer (Capreolus caprca, Gray ${ }^{1}$ ), in the ' Field ' of the 18th January ; and I am indebted to the courtesy of the gentleman who shot it, Mr. John B. Fergusson,

[^1]for further particulars, which add much to the interest of the case. The doe in question was killed on the estate of Sir James Fergusson, Bart., of Kilkerran, Ayrshire, on the 5th January, 1879. The antlers were "in the velvet," one being a simple curved snag about six inches in length, while the other was represented by a short stump. The animal was in good condition, and was not barren; for on the day she was shot she was accompanied by a lastyear's fawn, and her nipples showed evident signs that she had recently been suckling. Most unfortunately the head was not preserved; but Professor Flower has kindly called my attention to the


Skull of female Roe-deer, with antlers.
skull of another fertile antlered doe Roedeer, which is now in the Museum of the Royal College of Surgeons. This example was shot by the Earl of Egremont near Petworth, Sussex, in 1810 ${ }^{1}$, and presented by him to the Museum. The antlers, as shown in the drawing, have evidently been covered with the velvet. The right is a simple curved snag about three inches in length, with a well developed burr; the other is represented by a small mushroom-shaped burr without any beam. Lord Egremont in his letter expressly states that the Deer was "a very old and uncommonly large female, with two young ones in ber."

[^2]In Germany, where the Roedeer is more plentiful than in this country, many does with antlers have been recorded, no fewer than forty instances being known to Dr. Altum ${ }^{1}$. Most of these were barren animals, and the antlers were always of a more or less abortive character, except in one case, in which the normal male form was well reproduced; but several were fertile, and were either with young when they were killed, or had recently given birth to fawns. The abnormal antlers appear to be always persistent, and to be permanently covered with the velvet.

In America the same abnormality appears not to be very uncommon in the Virginian Deer (Cariacus virginianus, Bodd.). Judge Caton says that he has seen many accounts of does with small, simple, velvetclad antlers, and describes such a head in the National Museum at Washington, in which the beams are about six inches long. He has heard of a similar case of a doe killed in California, probably Cariacus columbianus (Richardson) ${ }^{2}$; and Mr. Dresser informs me that in New Brunswick he once examined in the flesh a female Moose (Alces machlis) with well-developed bifurcated antlers.

In the Deer of the restricted genus Cervus, on the other hand, the occurrence of antlered females seems to be extremely rare. In all the voluminous literature of German wooderaft Dr. Altum has only been able to find records of five cases of the abnormality in the Red Deer (Cervus claphus, Linn.), of which the latest dates from early in the last century ${ }^{3}$. I have not been able to find any record of its occurrence in the Fallow Deer, nor, in fact, in any other species of Cervus, except the Sambur, C. aristotelis, Cuv., of which Mr. Vincent Ball informs me that there is a hind with a single antler now living in the Zoological Gardens at Calcutta.

We thus find, scanty as is the hitherto recorded evidence, that the development of antlers in the female is a not very uncommon abnormality in the two best-known genera of Sir Victor Brooke's section of Telemetacarpi (Capreolus and Cariacus), occurs in a third (Alces), and is normal in a fourth (Rangifer), while, as far as we know, it is extremely rare in the Plesiometacarpi. As the former division is the least specialized, these facts seem to me to indicate that the abnormalities are instances of atavism, and that the primeval Deer probably possessed antlers in both sexes. I make this suggestion, however, with all deference ; for the contrary view has been adopted by Mr. Darwin, who holds that both the antlers of the Cervide and the horns of the Bovida were primarily and essentially sexual weapons, first developed in the males only. "When the males are provided with weapons which in the female are absent, there can hardly be a doubt that these serve for fighting with other males, and that they are acquired through sexual selection, and were transmitted to the male sex only" ${ }^{4}$. Of the Reindeer he says:-"We may conclude that the possession of fairly well-developed horns by the female Reindeer is due to the males having at first acquired them as weapons for fighting with other males, and, secondarily, to their development from some

[^3]
unknown cause at an unusually early age in the males, and their consequent trausference to both sexes." ${ }^{1}$

That sexual selection has played a very important part in the subsequent development of the horns and antlers of the Pecora there can be no reasonable doubt; but the known facts appear to me to indicate that they were probably first developed in both sexes as organs of defence against common enemies. They are present in the females of the Canelopardalide, in those of all the Bovide except twelve genera of Antilopince ${ }^{2}$, and in those of one genus of the least-specialized section of the Cervida, while we have seen that they are not unfrequently abnormally developed in the two other genera of the same section with which we are best acquainted. The same abnormality, it may be added, occurs in at least one of the genera of Antelopes, in which the females are usually hornless ${ }^{3}$.

On the assumption that the antlers and horns of the Pecora were first developed in the males only, their presence in the females of so many forms can only be explained by the hypothesis that "an unknown cause" has led to their transference from the other sex. On the other hand, if they were at first common to both male and female, the problem appears to me to be capable of a more satisfactory solution. In the males they would naturally be further developed by sexual selection, and in the females the strain on the constitution would tend to their reduction or even elimination-this strain, as Mr. Darwin himself has pointed out, being much the greatest in the Cervidce, in which the weapons require to be renewed every year. That they should be retained (usually in reduced size) by the females of most of the forms with non-deciduous horns appears therefore to be natural; while their retention in the female of the Reindeer, and their occasional abnormal development in those of other little-specialized Deer, is no more than we should expect on the doctrine of heredity.
3. Remarks on some Parrots living in the Society's Gardens. By P. L. Sclater, M.A., Ph.D., F.R.S., Secretary to the Society.

> [Received March 13, 1879.]
> (Plate XX VIII.)

During the preparation of a new edition of the List of Vertebrates in the Society's Collection I have, as on former occasions of a like nature ${ }^{4}$, made several notes referring to special rarities and necessary charges in nomenclature of the Psittacidæ, which I beg leave to offer to the Society.

Our series of Psittacidæ at the present moment consists of about 170 individuals, belonging to 98 species, amongst which, besides those

[^4]specially mentioned below, are examples of Licmetis gymnopis, Ara spixi ${ }^{1}$, Coracopsis barklyi, Chrysotis guildingi, Chrysotis bouqueti ${ }^{2}$, and Nestor hypopolius.

The species, however, to which I now wish to call special attention are the following;-

1. Brotogerys tuipara (Gm.), and
2. Brotogerys chrysoptera (Linn.).

Dr. Finsch has regarded the latter of these two birds as the young of the former, but, I believe, quite incorrectly, as will be apparent to those who examine our living specimens of these two species, of which I also exhibit skins from my collection. B. chrysoptera has a narrow frontal margin of dark brown, and a brownish throat, which never develops into the orange front and chin-spot of $B$. tuipara.

In my 'Catalogue of American Birds' (p. $3 \| \phi$ ) I have called $B$. tuipara B. notata, being the bird figured in Pl. Enl. t申. fig. 2 (undè Psitt. notatus, Bodd.), and B. chrysoptera I have called B. tuipara.

Certain localities are, for B. tuipara, Barra do Rio Negro (Wallace), and for B. chrysoptera, Venezuela (Mus. P. L. S. et S.-G); but both species seem to occur in Guiana.

## 3. Paleornis cyanocepbalus (Linn.).

4. Palfornis rosa (Bodd.).

We have now also adult examples of both these nearly allied species, which have likewise been united by Dr. Finsch, but are clearly distinguished by Mr. Hume (Stray Feath. ii. p. 15).

Mr. Gould has lately given excellent figures of both (Birds of Asia, pt. xxvi.), but has unfortunately reversed the names.

## 5. Paleornis fasciatus.

Psittacus fasciatus, P. L. S. Müller (ex Pl. Enl. 517).
Palcornis fasciatus, Hume, Stray Feath. vii. p. 164.
Paleornis melanorhyncha, Scl. P. Z. S. 1871, p. 771, et 1878, p. 999 ; Blyth, Ibis, 1873, p. 79.

Palaornis schisticeps, Scl. P. Z. S. 1876, p. 696.
I quite agree with Mr. Hume (l.s.c.) that the figure in the Planches Enluminées (517), attributed by Finsch to P. javanicus, is more probably intended for its Indian ally ( $P$. lathami et P. melanorhynchus of Finsch), and that the best plan is to call the latter P. fasciatus.

Of this species we have now three examples living in the collection, namely:-
$a$. A black-billed bird (and therefore, I presume, a female), presented by Mr. Edmund Warre, April 12, 1871, and stated to have been brought from Cashmere. This is the specimen alluded to by Blyth, Ibis, l. s. c.

[^5]b. A second black-billed specimen, purchased Sept. 25, 1876. This bird, when in immature and dirty plumage, on its first arrival, was wrongly referred to $P$. schisticeps, of which species we have never received living specimens.
c. A bird with the upper mandible red, and therefore, I suppose, male, brought from Muttra, North-west Provinces, and presented Feb. 21, 1878, by Mrs. Barthorp.

Of the allied form of Java and Borneo ( $P$. javanicus ${ }^{1}$ ) we have at present no specimens in the Collection.

## 6. Caica xanthomera. (Plate XXVIII.)

Caica xanthomeria, Sclater, P. Z. S. 1857, p. 266.
Psittacus xanthomerius, Gray, List of Psitt. p. 73.
Caica xanthomera, Scl. P. Z. S. 1877, p. 419.
Pionius xanthomerus, Finsch, Papag. ii. p. 437.
Of this beautiful Parrot we received two living examples from Yquitos, on the Peruvian Amazons, in 1877, as already recorded. One of these is dead; but the other is now in fine plumage, as the accompanying sketch by Mr. Sinit (Plate XXVIII.) will show.

Besides the type in the British Museum, from the Rio Javari (Bates), and a single example obtained alive by Natterer on the Madeira (Pelz. Orn. Bras. p. 264), our specimens are, I believe, the only ones known of this species.
4. Notes on the Visceral Anatomy of the Tupaia of Burmah (Tupaia belangeri). By A. H. Garron, M.A., F.R.S., Prosector to the Society.

## [Received March 5, 1879.]

On February 8th, 1875, the Society received as a present from the Hon. Ashley Eden, C.S.I., a male Burmese specimen of Tupaia belangeri, which died, without any perceptible organic lesion, on December 18th, 1876.

Not much is known of the anatomy of the Tupaiidæ, the most important account of the viscera with which I am acquainted being that by Dr. Cantor on Tupaia ferruginea ${ }^{2}$.

Subjoined are the notes on the anatomy of the Society's specimen of T. belangeri.

The parotid and submaxillary glands are of about equal size, flattened and subcircular, a little less than half an inch in diameter, the duct of the former coursing superficially near the lower border of the powerful masseter muscle. The duct of the latter opens

[^6]by the side of its companion, at the tip of a small and slender pointed papilla situated just behind the symphysis of the lower jaw. The sublingual glands form a linear chain along the floor of the mouth.

The tongue, which is rounded at its tip, is 1.3 inch in length and 35 inch broad, having its margins nearly parallel. Its upper surface is covered with filiform papillæ, among which are scattered papillæ fungiformes, very much in the same proportion as in the Ruminantia. There are three conspicuous circumvallate papillæ, arranged in the usual V-shaped manner.

A rudimentary unfringed sublingua exists, which is lanceolate in contour, just free at its margins, and with a strongly marked median raphé. It much resembles the same structure in Cheiromys ${ }^{1}$. Dr. Cantor says of the same organ in Tupaia ferruginea ${ }^{2}$ that "on the lower surface of the tongue the frænum is continued to within a short distance of the apex, in a raised line, on either side of which the skin is thickened, fringed at the edges, and thus presenting a rudimentary sullingual appendage, somewhat similar to that observed in Nycticebus tardiyradus, though in Tupaia ferruginea the fringes of the margin only are free, the rest being attached to the tongue, but easily detached by a knife."

The palate is transversely grooved, presenting upon its surface seven strong curved ridges, convex forward, and a small median incisor pad at its anterior end. The soft palate is smooth and lengthy, with no indication of the existence of a uvula.

The œsophagus has no free course in the abdominal cavity, being embraced by the diaphragm quite close to the cardiac orifice of the stomach.

The stomach is subglobose, with the cardiac and pyloric extremities approximate. When laid out flat its circumference is 6.2 inches, the interval between the axis of the œsophageal tube and that of the commencing duodenum being 0.9 inch. The squamous epithelium of the œesophagus does not enter the stomach, but ceases at its orifice, as in man. The gastric walls are simple, except that there are somewhat larger glands, in patches, on the anterior (ventral) surface.

The liver has no umbilical fissure, whilst both lateral fissures are strongly marked. There is a cystic fissure, at the bottom of which the fundus of the gall-bladder reaches the diaphragmatic surface of the organ. The left lateral, with its irregular inner margin, is the largest of the lobes; next comes the right central, on the visceral surface of which the imbedded gall-bladder lies diagonally. The right lateral lobe is slightly larger than the left central, and the caudate lobe but little smaller, whilst the Spigelian is a small subcircular mass of hepatic tissue supported on a very sleuder stem. The bile and pancreatic ducts open together into the duodenum half an inch from the pylorus.

The walls of the intestines are thin. The small intestine is 29.25

[^7]inches in length, and 0.8 inch in circumference. The large intestine measures just over 3 inches, the conical and blunt-tipped cæcum not exceeding 0.7 inch in length. In Dr. Cantor's specimen of Tupaia ferruginea the small intestine is longer, reaching 40 inches. The mesenteric arteries form loops before they finally distribute.

The kidneys are smooth, with a single calyx. The testes appear large proportionately, the particularly big epididymis alone descending into the rudimentary scrotum. The prostate is bilobed, Cowper's glands being of fair size. The glans penis is elongately filiformly conical, and terminally a little blunted.

The aortic arch divides as in man, giving off a right innominate, a left carotid, and a left subclavian. There are two independent innominate veins, right and left.

The lungs are deeply divided into three main lobes on each side, whilst on the right the extra azygos triangular lobe is also found, not so large as any of the others.

Through the kindness of our President, I have had the opportunity of dissecting a female specimen of Tupaia tana, where there is a feebly developed sublingua, a less globose stomach, a lengthy thin-walled small intestine, no trace of a cacum, and a thick-walled large intestine 3.25 inches long, quite easily distinguishable as such. The caudate lobe of the liver is much larger proportionately than in T. belanyeri. In that there is no umbilical fissure, whilst that of the gall-bladder is very deep, the two species agree.

Dr. Günther has also permitted me to eviscerate a Bornean specimen of Tupaia splendidula in the National Collection. Its liver is constructed on a plan identical with that of the two other species, the left lateral lobe being much the largest, the umbilical fissure

Fig. 1.


Brain of Tupaia belangeri; lateral aspect.
nearly obsolete, the cystic fissure deep, and the Spigelian lobe bifid. The caudate lobe, however, is long and narrow. The colon was very much distended, and with it the cæcum, so that the ileo-cæcal valve appeared to be situated at the side of the dilated colon, near to the blind extremity. If there had been no enlargement I should infer, from inspection, that the cæcum is normally less than half an inch in length.
The brain of Tupaia belangeri is smooth on its surface, and otherwise much resembles that of Solenodon ${ }^{1}$, Rhynchocyon, Petro${ }^{1}$ "Ueber die Säugethiergattung Solenodon," pl. ii., Abhandlungen der 5. Akad. der Wiss. zu Berlin.
dromus, and Macroscelides, as figured by Dr. Peters ${ }^{1}$. It is broadest a little behind its middle, from which it narrows gradually in front, more rapidly behind, so as to be pyriform in general outline when

Fig. 2.


Brain of Tupaia belangeri; superior aspect.
seen from above. No trace of any convolutions can be detected. The olfactory lobes are considerable in size, longer than broad. Each hemisphere is very slightly convex from before backwards, its

Fig. 3.


Brain of Tupaia belangeri; mid-longitudinal section.
outline forming the base of the triangular side view of the organ, the two other sides of which are of nearly equal length, so that its deepest part is at about its middle.

The corpus callosum is thin and nearly straight. It continues forward to within one sixth of the length of the hemisphere from its
${ }^{\prime}$ Reise nach Mossambique, 1852, pl. zxiv. figs. 10, 12, 13.

anterior margin. The corpora quadrigemina are large, especially in front.

The cerebellum is just overlapped at its anterior border by the back of the cerebral hemispheres ; otherwise it is quite posterior.

The several lemurine resemblances of Tupaia makes the simplicity of its cerebral surface somewhat surprising.
5. Notes on the Anatomy of Helictis subaurantiaca. By A. H. Garrod, M.A., F.R.S., Prosector to the Society. [Received March 10, 1879.] (Plate XXIX.)
A specimen of Helictis subaurantiaca, from China, purchased by the Society on Nov. 26, 1874. ${ }^{1}$, having died on Nov. 29, 1878, I take the present opportunity of recording some of the most important facts in its visceral anatomy, more on account of the rarity of the animal in this country, than because it presents peculiarities of any kind.

It may first be noticed that the skins of this species collected by Mr. Swinhoe, and now in the national collection, seem to have faded very much in their underparts, which, quite in opposition to that naturalist's original account of his species, are a pure white. It may further be mentioned that Helictis is extremely Badger-like in its proportions, gait, and odour.

On comparing the skull of the Society's specimen with the small collection of skulls of the genus in the national collection, I found no small difficulty in detecting any intimate resemblance to any. In most of its measurements it agrees exactly with those of $H$. moschata, as recorded by Dr. Gray ${ }^{2}$.

In the Society's specimen the skull retained no trace of any sutures, and the lower jaw was considerably diseased, apparently in association with decay of the teeth. I hardly think, however, that extreme old age will account for the peculiarities of the individual under consideration. If differs from other specimens of H. moschata and $H$. subaurantiaca, and much more resembles $H$. nipalensis and H. orientalis, in that its zygoma is massive, the premaxillary region short as well as comparatively broad, and the mid-parietal area between the upper margins of the temporal muscular origins decidedly broad. The premolar and molar teeth are heavier than in H. moschata and $H$. subaurantiaca, lighter than in M. nipalensis and $H$. orientalis, with the two former of which species it most agrees in the size of the zygomatic foramen, with the two latter in its situatio之.

[^8]Proc. Zool. Soc.-1879, No. XX.

The following were the measurements, taken a few hours after death:-
inches.
Tip of nose to base of tail ................... $14 \% 5$
Tail........................................... 6.9
Ear .......................................... $1 \cdot 4$
Tip of nose to occipital ridge ............... $3 \cdot 8$
Sex, female.
The two pairs of inguinal nipples are widely separate, forming the four corners of a square.

The clavicles are reduced, each 3 inch long, the scapular extremities remaining.

The tongue is covered with small, similar, retroverted filiform papillæ, with a fair scattering of fungiformes. The papillæ circumvallatæ, two on the left, three on the right, and one in the angle, form the usual V .

The right lung has four lobes, one being the azygos. On the left side there only two lobes.

The stomach is exactly like that of Arctictis binturong (as figured by me ${ }^{1}$ ) and nearly all Carnivora when contracted. The small intestive is seven feet in length, the large intestine six inches and three quarters. There is no cæcum; but an abrupt change in the nature of the mucous membrane from thin and villous to thick and smooth indicates the junction of the tubes.

The liver conforms completely to the carnivorous type, the right central lobe being largest, with a deep cystic fissure, and a gall-bladder so deeply imbedded that its fundus is seen on the diaphragmatic surface of the organs. The left lateral lobe comes next in size, the right central, and then the caudate following, after which the left central lobe, and the small Spigelian last.

The pancreas is seven inches in length, its left terminal two inches being in relation with the narrow spleen (two and three quarters inches in length).

There is a pair of pea-sized anal glands, opening into the rectum near the sphincter, in a linear transverse orifice on either side.
The uterus is strongly bicorn; the vulva much enlarged, with a well developed gland on each side of the orifice of the meatus urinarius.

The brain conforms to the Musteline Carnivorous type, not to that of most of the Arctoidea. In Prof. Flower's excellently concise definitions of the three different arrangements of the cerebral convolutions in the Carnivora ${ }^{2}$, he tells us that " in the Aretoidea the fissure of Sylvius is rather long, and slopes backwards; the inferior gyrus has the limbs long, corresponding with the length of the Sylvian fissure, the anterior rather narrower than the posterior (especially in the true Bears); the middle gyrus is moderate and equal-limbed, the upper one large, very broad irr front, and distinctly marked off from the second posteriorly as far as near the lower

[^9]border of the temporal lobe ( $\ddagger$ ). The crucial fissure is long and oblique, and situated further back than usual." In the footnote ( $\ddagger$ ) we read, "Except in the smaller numbers of the genus Mustela, where the sulcus separating the superior from the middle gyrus is less produced posteriorly than in others of the group. In Galictis vittata, however, the brain is quite a miniature of that of a Bear ; but the middle convolution is united with the upper one at its superior anterior angle.

Fig. 1.


Brain of Helictis subaurantiaca; superior aspect.
Fig. 2.


Brain of Helicits subaurantaica; lateral aspect.
In Helictis, as also in Ictonyx zorilla, the superior gyrus ceases at the superior posterior angle of the hemisphere, as in Mustela. The anterior limb of the inferior gyrus is extremely narrow, especially near its upper end, where it becomes almost hidden by the corresponding part of the posterior limb of the same gyrus. A small sulcus tends to divide the transverse part of the middle gyrus from its posterior limb.

Most peculiarly, in Helictis there is no crucial fissure, because the hippocampal gyrus appears upon the superior aspect of the brain. This is the case in no other carnivorous animal with which I am acquainted, but occurs in Moschus, Cervus pudu, and other smaller Ruminantia.

A pril 1, 1879.

Prof. W. H. Flower, LL.D., F.R.S., President, in the Chair.

The Secretary read the following report on the additions to the Society's Menagerie during the month of March 1879 :-

The total number of registered additions to the Society's Menagerie during the month of March was 63, of which 28 were by presentation, 3 by birth, 22 by purchase, 7 were received on deposit, and 3 by exchange. The total number of departures during the same period, by death and removal, was 98 .

The most noticeable additions during the month of March were as follors:-

1. A young male of the Mule Deer of North America (Cariacus macrotus), obtained from Dr. J.D. Caton, of Ottarw, Illinois, U.S.A., and received March 12. Through the kind intercession of the Secretary of the Smithsonian Institution, Judge Caton has been induced to send us our first example of this peculiar Deer, of which we may hope shortly to receive hinds also, by the aid of kindly promised assistance from the same influential quarter.
2. A male Sumatran Rhinoceros, deposited March 20th.

This is the first male of the Sumatran Rhinoceros that we have yet received, the examples previously exhibited in the Society's Gardens having been all of the female sex. In general appearance this specimen presents all the characters of the Rhinoceros sumatrensis as distinguished from R. lasiotis.

The Secretary read the following extracts from a letter addressed to him by Mr. Carl Bock, dated Padang Panjang, Sumatra, Jan. 24, 1879.
"The Capricornis sumatrensis, or 'Mountain-Antelope' as you very properly call it, I have been on the look-out for ever since I left Padang; I was told by several there it has never reached Europe alive. It is sparingly distributed over the mountains here in the highlands proper; the best district is Lolo, where I spent more than one month, and had two men all the time in the most inaccessible parts purposely to catch some 'Kambing-utan,' as the Malays call the animal. I succeeded in getting a young male of perhaps 10 to 12 months. I have named him ' Lolo.' I give you an extract from what I hare noted down about the animal.
"The 'Kambing-utan' or wild Goat, when I first saw the animal, struck me as not being like a Goat at all; his form and outline more resemble that of a young Reindeer. He is a young male of perhaps ten months to a year old; his colour is jet-black; he has long coarse hair, and a mane of stiff hair of a whitish grey colour; the length of the hairs ranging from 3 to 4 inches. His ears are thinly corered inside with white hairs, on the outer side of brown colour, mixed with black; the cars are remarkably long and erect; when he listens he bends them quite forward past the horns; the latter are
straight, and from the root to about the middle there is a deep furrow in each. In the old animals the horns (of which I have several pairs) are curved, and halfway up are furnished with a number of rings, which, again, are striated longitudinally; the apex is quite smooth. All the horns I purchased were more or less covered with earth and bark firmly rooted between the wrinkles. The eyes have rather the appearance of revenge than that gentle and mild expression so common among the Deer. An inch below the eyes, in a lateral line, are on each side a glandular opening or lacrymal passage, from which now and then (especially when the animal is irritated) an oily substance of a white colour is secreted, which hardens and becomes dark when exposed to the air. My specimen has slight traces of a beard coming. I am told by the Malays that the old males have a long beard. His scrotum is large and covered with white hair. He is a powerful animal, but appears by no means very active, and moves about very slowly. In their wild state they live upon buds and leaves. I am trying to domesticate my specimen; he does not now get many leares from the forest, but 8 or 10 pisangs a day; these he is very fond of. Before commencing to eat he blows and scents at the food for a few minutes. I have noticed that he does not drink any water; but I always let my cook throw a quantity of water over the leaves. I hope to procure a female as companion for him; then I think they will live in bondage, especially as they have been caught young. I have several persons in different parts of the highlands looking out for the Mountain-Antelopes, and have offered good rewards for a female; unless I move to another island I will bring the Kambing-utan to England under my orm care, as 'Lolo' knows me pretty well, for I feed him every day."

Mr. Sclater exhibited the eggs of birds collected by the naturalists of the 'Challenger' Expedition, which had been arranged in order in 18 glass-topped boxes.
The whole series consisted of about 250 eggs referable, so far as they could be determined, to about 50 species, as follows:-

List of Eggs collected during the 'Challenger' Expedition.

| a. Passeres. |  | No. of |
| :---: | :---: | :---: |
|  | Locality. | Eggs. |
| 1. Phrygilus melanoderus ( $Q$. et $G_{0}$ ) ? | Falklands. | 2 |
| 2. Turdus falklandicus, Q.et G. $2 . . . . . . . . . . . . . .$. | " | 2 |
| 3. Anthus correndera, Vieill.......................... | " | ${ }^{2}$ |
| b. Accipitres. |  |  |
| 4. Milvago australis (Gm.)? | Falklands. | 2 |
| 5. Buteo erythronotus (King) ?..................... | " | $\stackrel{2}{2}$ |
| 6. Cathartes aura (Linn.) ............................ | " | 2 |

c. Steganopodes. No. of
Locality. ..... Eggs.
7. Phalacrocorax verrucosus (Cab.) Kerguelen. ..... 10
8. Phalacrocorax albirentris (Less.) Falklands. ..... 2
9. Sula leucogastra (Bodd.) Raine Island. ..... 1
10. Sula cyanops, Sund. ..... 1
11. Sula piscator (Linn.) ..... 1
Sula, sp. inc. ..... 9 ..... 9
12. Phaeton æthereus, Linn. ..... 4
Bermuda.
13. Fregata aquila (Limn.) ..... 5
d. Herodiones.
14. Nycticorax obscurus, Bp. Falklands. ..... 2
e. Anseres.
15. Chloephaga magellanica (Gm.) Falklands. ..... 2
16. Bernicla antarctica (Gm.) ..... 2
17. Tachyeres cinereus (Gm.) ..... 2
18. Querquedula eatoni, Sharpe
Elizabeth Island ..... 1
Kerguelen. ..... 7
19. Querquedula flavirostris (Vicill.) ..... 2
20. Anas cristata, Gm " ..... 2
$f$. Columbe.
21. Carpophaga rhodinolæma, Scl. Admiralty Islands. ..... 3
g. Galline.
22. Numida meleagris, Linn. Ascension. ..... 2
h. Limicole.
23. Chionis minor, Hartl. Kerguelen. ..... 8
24. Hæmatopus, sp. inc. Fallilands. ..... 2
25. Gallinago frenata (Max.)? ..... 2
26. Eudromias modesta (Licht.) ..... 2 ..... 2
i. Gayie.
27. Sterna fuliginosa, Gm. Raine Island. ..... 15
Ascension. ..... 7

28. Stërna hirundinacea (Less.)
29. Stërna hirundinacea (Less.) Elizabeth Island. $\quad 16$29. Sterna, sp. inc.
30. Anous stolidus (Limn.) Raine Island. ..... 9Herd Island.1
31. Larus dominicanus, Licht. Kerguelen. ..... 1
Elizabeth Island. ..... 2
", ", " Falklands. ..... 2
32. Larus, sp. inc ..... 2
33. Stercorarius antarcticus (Less.). Nightingale Island. ..... 4
$3 \%$. Diomedea exulans, Linn. Falklands. ..... 2
Kerguelen. ..... 1
3ั้. Diomedea, sp.inc.
Marion Island. ..... 3
Nightingale Island. ..... 1
34. 
35. Diomedea melanophrys, Temm.
Tristan d'Acunha.
Tristan d'Acunha. ..... 3
36. Majaqueus æquinoctialis (Linn.)Falklands.3
37. Estrelata lessoni (Garn.)? ..... 10
38. Daption capensis (Linn.) ? ..... 1
39. Prion desolatus (Gin.) ..... 21


Mr. J. W. Clark, F.Z.S., exhibited a drawing of a species of Lagenorhynchus lately taken off Ramsgate.

Mr. Clark described the coloration of the animal, which was a male, nearly if not quite adult ; and showed that it agreed in the main with that of a young Delphinus described by him two years ago, and referred with some doubt to Lagenorhynchus albirostris (P.Z.S. 1876, p. 686).

Mr. St. G. Mivart, F.R.S., exhibited a figure of a Kestrel (Tinnunculus alaudarius) shot by the Marquis de Wavrin of Brussels, in the Ardennes, and preserved in his collection there. The bird had on each leg an extra toe, placed very high up, and provided with a long and quite straight and pointed claw.

The following papers were read :-

1. A Contribution to the Avifauna of the Sooloo Islands. By R. Bowdler Sharpe, F.L.S., F.Z.S., \&c., Senior Assistant, Department of Zoology, British Museum.
[Received March 18, 1879.]
The present collection was formed by Mr. F. W. Burbidge during a short stay in the Sooloo Islands, a most interesting locality to the ornithologist, and one of which very little is known. In my paper on Dr. Steere's collections from the Philippines, I noticed the four species of birds as yet recorded from the Sooloo Islands', and I ought to have added the common Artamus of the Indo-Malayan region, and a Cuckoo, both recorded by Peale from Mangsi.

In addition to the birds obtained by Mr. Burbidge, I have received ${ }^{1}$ See Trans. Linn. Soc. n. s. i. p. 310.
permission from the authorities of the Oxford Museum to describe the large Bornean collections forwarded to that institution by Mr. W. H. Treacher, Acting Governor of Labuan. Amongst them are a few birds from Sooloo, but apparently not the result of a separate expedition, but presented to Mr. Treacher by Mr. Burbidge. To the latter gentleman I an indebted for the following notes. "Among the birds which I saw in Sooloo, but could not secure, I would particularly mention :-some Hornbills, seemingly the common black-and-white small kind from Labūan; a fine white Harrier, with black tips to the wings (this is a distinct and handsome bird, not unfrequently seen circling over rice-fields or grassy plains) ; the 'fire-backed' Pheasant; and an Owl , apparently a larger and brightercoloured edition of our Common Barn-Owl or Screeching species. The blue, white-ringed Kingfisher (Halcyon chloris) of Labüan is very common here, as is also the rufous, white-headed Scavenger Hawk or Eagle ${ }^{2}$; and at least two other species, both larger, are to be found looking out for food near the wharf at Meimbong. Curlews are as plentiful here as in Sarawak and other parts of Borneo. I missed the nocturnal 'chuck-chuck ' of the Goatsucker, so common in Labūan. Water-Rails and a pretty blue Kingfisher are not uncommon by the margin of the Meimbong river, which is close to the harbour, and is an excellent shooting-ground. Gun-boats often come here; and as the country is now readily accessible, much might doubtless be done in ornithology. Capital angling may be had in this little river; and there is a good bathing place near the town and close to the market, where one may be entirely free from the fear of an Alligator lurking about in wait for a meal. Now and then the Sultan and his court, male and female, together with all the principal people in the island, meet to enjoy the fun of Pig-hunting, the Wild Boar being very plentiful here, together with two or three species of Deer. These Pigs do a good deal of damage to cultivated crops; so that now and then a regular field-day is organized, and nearly every man, pony, dog, and spear in the island are out, versus 'Piggy,' as many as fifty of the latter being slain in a single day. There are so many kinds of sport easily attainable here, provisions of the best are so cheap, a pony may be hired for about $1 s .6 d$. a day, and there is so much that is novel to be seen about the towns and the court, that the wonder is that some traveller, fond of sport and especially ornithology, does not take up his quarters here for a month or twoand particularly as the place is easily reached from Singapore vid Labūan, or from Hong-Kong, viâ Manila."

Mr. Burbidge left England on a botanical expedition organized by Messrs. H. Veitch and Son; and his success in this department of natural history is well known. His chief attention having been devoted to plants, it only remains to thank him for the intelligent way in which he devoted his scanty leisure time to forming the present collection of birds.

The following I believe to be a correct list of Sooloo birds as at present known; and I have included the few species mentioned by

[^10]Peale as procured in Mangsi by the United States Exploring Expedition. I have also added the references to Lord Tweeddale's recent papers on the Philippine collections of Mr. Alfred Everett, and have given the ranges of the different species in the Philippine archipelago, so as to bring the subject up to the present date.

1. Cacatua hameturopygia (P. L. S. Müll.).

Cacatua hameturopygia, Wald. Tr. Z.S. ix. p. 132 ; Sharpe, Tr. Linn. Soc. n. s. i. p. 312; Tweedd. P. Z.S. 1877, pp. 756, 817 ; 1878, pp. 107, 281, 340, 379.

Two specimens.
[Luzon (Meyer); Guimaras (Meyer); Negros (Meyer, Steere, Everett); Zebu (Everett); Leyte (Everett); Nipah (Everett); Panaon (Everett) ; Butuan River, N. Mindanao (Everett); Sooloo (Burbidge).]

## 2. Prioniturus discurus (V.).

Prioniturus discurus, Wald. Tr. Z.S. ix. p. 132 ; Sharpe, Tr. Linn. Soc. n. s. i. p. 312 ; Tweedd. P. Z. S. 1877, pp. 538, 688, 756, 817, 1878, p. 379.

A single specimen, agreeing with others in the British Museum from the Philippine Islands.
[Luzon (Meyer, Everett); Negros (Steere); Zebu (Everett); Panaon (Everett) ; Mindanao (Cuming, Everett, Murray); Basilan (Steere); Sooloo (Burbidge) ; Balabak (Steere).]
3. Tanygnathus lucionensis (L.).

Tanygnathus lucionensis, Wald. Tr. Z. S. ix. p. 133; Sharpe, Tr. Linn. Soc. new series, i. p. 312 ; Tweedd. P. Z. S. 1877, pp. 538, 756, 817, 1878, pp. 281, 340, 612.

A single specimen collected by Mr. Burbidge, and exactly resembling the specimens from Manila and from Palawan in the British Museum.
[Luzon (Meyer); Guimaras (Meyer); Negros (L.C. Layard, Steere, Everett); Cebu (Everett); Leyte (Everett); Nindanao (Steere, Everett) ; Malanipa (Murray) ; Sooloo (Burbidge, Peale); Palawan (Steere, Everett).]
4. Tanygnathus burbidgii, sp. n.

Similis T. muelleri, ex Celebes, sed dorso toto sordide prasino, capite flavicanti-viridi et alis omnino viridibus distinguendus.
This fine new species of Tanygnathus is closely allied to $T$. muelleri of Celebes and T. everetti of Mindanao. It differs from T. muelleri in having the back green instead of yellow, while the head is yellowish green and not emerald green; there is also no blue on the wing-coverts, the whole wing being green.

The following is a full description of the bird.
Adult General colour above dark grass-green, including the hind neck, entire mantle, and scapulars; wings a little lighter green, the
wing-coverts and secondaries with narrow yellow margins, the primaries blackish on the inner web, externally dark grass-green with a slight blue shade along the shaft, the first primary black shaded with blue on the outer web; entire back and rump deep cobalt-blue; upper tail-coverts green, slightly shaded with yellow on the margins; tail-feathers dark green, with a narrow margin of yellow at the tip, the under surfare of the tail golden yellow; head yellowish green, the sides of the face also of this colour; the under-surface of the body bright grass-green, yellow on the throat and fore neck and passing into green on the breast and abdomen; under wing-coverts and under tail-coverts of the same green as the breast, with yellow margins; quills ashy blackish below. Total length 15.5 inches, culmen $1 \cdot 8$, wing $8 \cdot 6$, tail $6 \cdot 4$, tarsus 0.65 .

On comparing T. burbidgii with T. everetti, one is struck at once by the larger size of the former and its yellowish green head, the crown being emerald-green in T. everetti, which also has the wing only $7 \cdot 55$ inches in length (Samar: Mus. Brit.). None of the Sooloo birds, of which there are five in the collections, have the feathers of the mantle edged with blue as in the Samar individual.
5. Elanus hypoleucus, Gould.

Elanus hypoleucus, Sharpe, Cat. B. i. p. 338 ; Wald. Tr. Z. S. ix. p. 142 ; Tweedd. P. Z.S. 1877, p. 757.

An adult specimen: wing 11.5 inches.
[Luzon (Jagor); Cebu (Everett); Sooloo (Burbidge); N.W. Borneo (Treacher).]
6. Scops rufescens (Horsf.).

Scops rufescens, Sharpe, Cat. B. iii. p. 102.
One specimen.
This bird seems to me to differ slightly from Bornean and Malaccan examples in having a much darker face, the ear-coverts shaded with black. I do not, however, propose to found a new species on a single example, and must wait for more specimens. The measurements of the Sooloo bird are as follows:-Total length 7 inches, culmen $0 \cdot 7$, wing $4 \cdot 8$, tail $2 \cdot 6$, tarsus 0.85 . It will be seen that they are a good deal inferior to those of the type of Scops mantis, as given by me in the 'Catalogue.'
7. Cuculus fucatus, Peale.

Cuculus fucatus, Peale, U.S. Expl. Exp. Zool. 1848, p. 136.
C. tenuirostris, Less.; Cass. U.S. Expl. Exp. p. 244.

This Cuckoo may be Cuculus himalayanus, which has recently been shot in Labuan by Governor Ussher; but it is difficult to decide without seeing a specimen. At present the species is only known from the plate and description given by Peale, who procured it on the island of Mangsi.
8. Artamus leucorhynchus (L.).

Artamus leucorhynchus, Walden, P. Z. S. ix. p. 174 ; Sharpe, Tr.

Linn. Soc. new series, i. p. 323 ; Tweedd. P. Z. S. 1877, pp. 544, 692, 759, 826, 1878, рр. 283, 342.
A. leucogaster (Valenc.) ; Sharpe in Rowley's Orn. Misc. iii. p. 179. One specimen.
[Luzon (Meyer); Guimaras (Meyer) ; Negros (Meyer, Everett); Cebu (Murvay, Everett); Leyte (Everett); Mindanao (Everett, Steere); Sooloo (Burbidge); Mangsi (Peale).]
9. Oriolus chinensis, L.

Oriolus chinensis, Sharpe, Cat. B. iii. p. 203.
O. suluensis, Sharpe, tom. cit. p. 205.

Broderipus acrorhynchus (Vig.) ; Walden, Tr. Z. S. ix. p. 185; Tweedd. P. Z. S. 1877, pp. $545,694,760,826,1878$, pp. 110, 285, 342, 380.

The receipt of three more specimens from Mr. Burbidge convinces me that the Sooloo-Islands bird, which I thought was a race of $O$. frontalis, Wall., from the Sula Islands, is not really specifically separable from the common Oriole of the Philippines, called by me Oriolus chinensis and by Lord Tweeddale Broderipus acrorhynchus. A further comparison of the series seems to show that $O$. frontalis of Wallace, from the Sooloo Islands, is scarcely to be distinguished from $O$. chinensis, the only difference being the slightly greater extent of yellow on the tail-feathers in the latter bird.
[Luzon (Meyer); Panay (Murray); Guimaras (Meyer); Negros (Meyer, Steere, Everett); Cebu (Meyer, Murray, Everett); Leyte (Everett); Panaon (Everett); Dinagat (Everett); Mindanao (Steere, Murray, Everett); Sooloo (Burbidge); Si Butu (Low); Balabac (Steere).]
10. Corone philippina (Bp.).

Corone philippina, Sharpe, Cat. B. iii. p. 42 ; id. Tr. Linn. Soc. n. s. i. p. 343.

Corvus philippinus, Bp.; Wald. Tr. Z. S. ix. p. 201 ; Tweedd. P.Z.S. 1877, pp. 548, 698, 763, 831, 1878, pp. 113, 287, 343, 381.

Three specimens.
[Luzon (Cuming, Meyer, Everett); Cujo (Meyer); Panay (IIurray); Negros (Meyer, Steere, Everett); Cebu (Everett); Leyte (Everett) ; Panaon (Everett) ; Camiguin (Murray); Dinagat (Everett) ; Mindanao (Murray, Everett); Sooloo (Burbidge)].

## 11. Sarcops Lowif.

Sarcops lowii, Sharpe, l. c. p. 344.
Several specimens collected by Mr. Burbidge confirm the distinctness of this species from $S$. calvus.

## 12. Osmotreron vernans (L.).

Osmotreron vernans, Wald. Tr. Z. S. ix. p. 210; Sharpe, Tr. Linn. Soc. n. s. i. p. 346 ; Tweedd. P. Z.S. 1877, p. 764, 1878, p. 623.

A female specimen.
[Luzon (Heyer); Panay (Steere); Zebu (Everett); Sooloo (Burbidge); Palawan (Steere).]
13. Osmotreron axillaris (Gray).

Osmotreron axillaris, Walden, Tr. Z. S.ix. p. 211 ; Sharpe, Tr. Linn. Soc. ix. p. 346 ; Tweedd. P.Z. S. 1877, pp. 549, 699, 764, 832, 1878, pp. 113, 287.

An adult specimen.
[Luzon (Meyer, Everett); Guimaras (Meyer); Panay (Murray); Negros (Meyer, Steere, Everett); Cebu (Everett); Dinagat (Everett); Mindanao (Stecre, Everett); Sooloo (Burbidge).]

## 14. Carpophaga enea (L.).

Carpophaga anea, Wald. Tr. Z. S.ix. p. 215 ; Sharpe, Tr. Linn. Soc. n. s. i. p. 346 ; Tweedd. P. Z. S. 1877 , pp. 764, 832, 1878, pp. 113, 288, 344, 623.

One specimen.
[Luzon (Meyer); Negros (Meyer, Stecre, Everett); Cebu (Everett); Leyte (Everett); Dinagat (Everett); Mindanao (Everett); Sooloo (Burbidye) ; Palawan (Steere, Everett).]

## 15. Carpophaga pickeringi.

Carpophaga pickeringi, Cass. Pr. Philad. Acad. 1854, p. 228; id. U.S. Expl. Exp. p. 267, pl. xxvii. ; Sharpe, Tr. Linn. Soc. n. s. i. p. 353.

Procured by the United-States Exploring Expedition in the island of Mangsi.
16. Ianthenas griseigularis, Wald. et Layard.

Ianthenas griseigularis, Wald. Tr. Z. S. ix. p. 218; id. P. Z. S. 1878, p. 288.

One specimen.
I refer this Pigeon with some hesitation to I. griseigularis, of which I have uever seen a specimen, and only know it from Mr. Keuleman's figure in the Ibis for 1872 (pl. vi.). On the other hand, it is very closely allied to I. albigularis of the Moluccas, but differs in the greyish shade on the white throat, which is also more restricted, and in the forehead being grey with only a slight mark of lilac.
17. Calenas nicobarica (L.).

Calenas nicobarica, Cass.U.S. Expl. Exp. p. 276 ; Sharpe, P.Z.S. 1875, p. 110.

Observed on Mangsi in some abundance by the U.S. Exploring Expedition.

## 18. Ptilopus melanocephalus.

Ptilopus melanocephalus (Gm.); Elliot, P. Z. S. 1878, p. 551. An adult specimen.

19. Macropygia tenuirostris, Gray.

Macropygia tenuirostris, Walden, Tr. Z. S. ix. p. 218; Sharpe, Tr. Linn. Soc. new ser. i. p. 347.

Two specimens.
[Luzon (Meyer) ; Basilan (Steere); Sooloo (Burbidye).]
Lord Tweeddale differs from Professor Schlegel's opinion that the same Philippine species is found in Java and Lombock, where it is M. emiliana of Bonaparte; but having compared several specimens lately, I believe that the Professor's view is the right one, and that the bird is found over the Philippines, and occurs even in Borneo. Lord Tweeddale separates the Negros bird as M. eurycerca.

## 20. Gallus stramineicollis, sp. n.

General colour above black, shot with green and purple; wingcoverts like the back, the innermost and the scapulars with a slight subterminal shine of coppery brown; primary-coverts and primaries black, the secondaries externally green; feathers of the lower back and rump straw-yellow, with darker longitudinal centres of black or green; upper tail-coverts and tail glossy oil-green; crown of head and nape black; hind neck and neck-hackles, as well as sides of neck, straw-yellow, deeper on the hind neck, with green longitudinal centres to the feathers; remainder of under surface of body black with a green gloss; comb short and rounded; sides of face and entire throat bare. Total length $34 \cdot \bar{j}$ inches, culmen $1 \cdot 1$, wing $9 \cdot 0$, tail $17 \cdot 5$, tarsus 3.4 .

Mr. Burbidge procured a single example of this Jungle-fowl, which appears to be a very distinct species. He tells me that it was brought to the ship by one of the Sooloo natives alive, and he cannot vouch for its having been a wild bird. I have, however, shown the bird to Mr. Gould and other ornithologists; and they agree with me that it is probably a distinct species of Jungle-fowl. Governor Ussher also has seen the bird ; and he tells me that he has never seen any domesticated Fowls in Borneo or the Eastern Islands which approached this species in the least.
2. A List of the Birds of Labūan Island and its Depen. dencies. By R. Bowdler Sharpe, F.L.S., F.Z.S., \&c., Senior Assistant, Department of Zoology, British Museum.
[Received Mrarch 28, 1879.]
(Plate XXX.)
The materials for a list of Labūan birds have been considerable. First of all there is the little work ${ }^{1}$ on the natural history of the

[^11]island published in 18.55 by Messrs. Motley and Dillwyn, which gives 45 species as the number collected by the former of these gentlemen ${ }^{1}$. Secondly, I have examined two large collections sent by the Hon. Hugh Low ; and in 1875 I contributed to the 'Proceedings' of this Society a paper on the first of these which had been submitted to me ${ }^{2}$. As in the case of Mr. Motley's coilections, an exact record was not kept of the birds which inhabited Labüan as distinct from those which came from the mainland of N.W. Borneo; and it turns out that many of the species recorded by me in the paper abore mentioned are not inhabitants of Labūan at all. The second collection sent by Mr. Low was still more extensive, but contained no exact indications of locality excepting in a few rare instances; I was, however, able to obtain some particulars from Mr. Low during his visit to England before his departure for Perak, where he is now the British Resident. Previous to the two consignments here alluded to, Mr. Low had sent several collections to England, all of which were dispersed by his agents on every occasion as from Labūan; and specimens are doing duty in many Museums and private cabinets which ought to be labelled as from Lumbidan or the adjacent parts of North-western Borneo, and not from the island of Labūan.

On being appointed to the governorship of Labinan, my old friend Governor Ussher at once set to work exploring the ornithology of his dominion, and, with his usual zeal, speedily sent a large series of skins to my care at the British Museum. This series embraced collections from several localities, all carefully separated and indorsed, the most complete being that from Labūan itself, where the Governor is a resident, and where he has worked personally and by means of trained collectors, many of the latter being educated to the work by Mr. Low. The present list may therefore be considered perfectly authentic, every specimen being ticketed by Governor Ussher himself. Before turning to the personal notes of the latter gentleman, a great tribute is due to Mr. Low for his last collection from Borneo, which contained a very large series of eggs and nests taken with the parent birds by his trained hunters, and described in this and the paper which I have sent to the 'Ibis' on the birds of Lumbīdan.

The following is Governor Ussher's account of his collections:-
"The skins are nearly all in good order, and were chiefly collected by a Kadyan youth of the name of Buak, whom I tanght to shoot, having purchased a light gun for him. I am indebted to the IIon. Hugh Low, late Police-magistrate here, and now Resident in Perak, for having instructed several of these boys in skimning birds.
"The island of Labūan is about six miles from Borneo at the nearest point. The colony comprises the undermentioned islands, viz., Labūan, Daat, Karāman, Pappan, Great and Little Rusūkan, Burong, Enoe, and one or two nameless islets of diminutive size.

[^12]"Labūan itself is about ten miles in extreme length and four in breadth, and contains about 47 square miles. Dat contains probably about seven hundred acres, principally of fine forest; Pappan about sixty acres ; Karāman is of about the same size as Daat, the two Rusūkans being each smaller than Pappan, while Burong and Enoe are mere tufts of rock and forest in the sea. All the islands are finely timbered, though the forest on Labūan has been ruthlessly burnt for 'padi' planting. Burong Island is composed entirely of limestone-and is rather famous for possessing great numbers of a very venomous and spiteful-looking serpent of a brilliant emeraldgreen, which is generally found coiled round boughs at a few feet from the ground, and is usually motionless until disturbed. On Labūan and Daat Wild Boar are still to be found ; and on Daat alone the interesting Semnopithecus nasica exists, which has not been observed on the other islands. Daat is not more than a mile and a half from the coast of Borneo, between it and Labūan; it is probable that Bornean forms may be met with more frequently there than in Labūan, from which it is distant over four miles. Such Deer as Labūan once possessed have been pretty well exterminated. Gulls, Terns, and Waders are certainly not plentiful in these seas, and a new comer is struck by the absence of these graceful birds. At certain seasons Golden Plover, Snipe, and Painted Snipe make their appearance on the swampy low land near the sea. Shells are numerous and handsome; and a systematic course of dredging would produce some fine specimens. The Cones, Volutes, Harpe, Dolia and Cyprece are very fine; but those brought for sale are frequently injured by the natives in searching for them, or in making them more attractive to the purchaser.
"Natural history in Borneo owes a large debt to Mr. Low, one of the oldest residents in Labūan, whose name is well known to science. His labours in every department of zoology and botany, as well as his numerous excursions and travels in Borneo, and his intimate acquaintance with the various tribes of the great island, make him a foremost authority on all matters connected with their part of the Malay archipelago. To one of the several intelligent natives instructed in preparing birds I am indebted in great part for the present collection, which I trust will be found to contain the great majority of birds of 'Labūan and its dependencies.' I may add that I can vouch for the locality of every bird, as, with but one or two exceptions from trustworthy hands, they have all been shot by my Kadyan boy 'Būak' (who is retained in my house), or by myself, or by residents on the coast. At least fifty species have been obtained in the grounds of Government House, which is prettily situated in park-like land, dotted with forest, about one hundred and fifty acres in extent.
"The remaining birds in the collection, not specially includedin the Labūan series, come from the opposite coast. Some are from the neighbourhood of Borneo, others from the little-Kadhyan settlement of Lumbidan (whither I despatched my boy Būak for a month, after purchasing some birds from natives), on the north-west coast, and
about thirty miles above the mouth of the Brunei river. One or two may come from intermediate localities, such as the 'Lawas' and 'Kalias' rivers; they will all be carefully distinguished as to locality. My time is not sufficiently at my own disposal to permit me to record many of those valuable observations so useful to science; and I am conscious of many painful deficiencies, which can scarcely be excused even in a mere outdoor collector.
"I believe, however, that although many of the birds have been sent home from time to time by former collectors, the Labuaan birds were not always distinguished from those from the mainland of Borneo-also that Hawks and Owls were not often obtained before by native collectors, who are generally dependent for their specimens on the sumpitan or blow-pipe, which is insufficient for large game.
"The Snipe, Plover, and Waders seem to arrive about August and to leave about the beginning of March, though I suspect that a few of them remain all the year, as I have seen them in April. The Asiatic Golden Plover on their first arrival have remains of their black summer dress; but they soon lose it ; I observed none in that plumage after September. Curlew or Whimbrel appear to hang about all the year round.
"The Pigeons are numerous and of varied kinds; and on some of these I append a few notes; but I was unable through illness to carry the latter on beyond September."

Lastly, on the recommendation of my kind friend Dr . Sclater, a large and important collection has been placed in my hands for description by Professor Rolleston. This collection was formed by Mr. W. H. Treacher, Acting-Governor of Labīan, and by him presented to the Oxford Museum. In the splendid series of birds sent by Mr. Treacher are many interesting additions to the avifauna of Borneo, some of the most striking of which, however, came from the main-land-that is to say, the province of Lumbidan. The collector has succeeded, however, in adding more than one species to the list of Labuan birds. Accompanying the catalogue of native names, which form a prominent feature in Mr. Treacher's collection, was a glossary, which I herewith transcribe. Too much reliance, perhaps, must not be placed on the names given by natives of any country, though it is only fair to add that those given by Mr. Treacher accord in nearly every instance with those furnished by Mr. Motley and Mr. Low; nor should I have made the above remark but for the fact that different names are sometimes given to the same bird when procured on the mainland and on Labūan itself.

The following is Mr. Treacher's glossary :-

| Ayan | Fowl. |
| :---: | :---: |
| Anie. | White Ant. |
| Api | Find. |
| Biru. | Blue. |
| Burpalang | Particoloured |


| Bulan | Moon. |
| :---: | :---: |
| Badan. | Body. |
| Babat Mayat | To tie a corporal (Mayat) with strips of white cotton cloth, according to island custom. |
| Bras. | Rice. |
| Bodoh | Foolish. |
| Darak | Blood. |
| Darat | Inland. |
| Etek | A Duck. |
| Hijan or yön | Green. |
| Hutau. | Jungle. |
| Hujan | Rain. |
| Jambul | A crest. |
| Kuchik | Small ; little. |
| Kuning | Yellow. |
| Karampok | A knife with a curved blade, which somewhat resembles the feathers of a Bulwer's Pheasant (Karampaki). |
| Kaug Kaug | To straddle; to open the legs. |
| Lahir | The neck. |
| Lalang | The common species of long grass. |
| Landack | A porcupine. |
| Merah. | Red. |
| Malagoondi | The name of a tree. |
| Pulita | A lamp. |
| Pirang | Brown. |
| Panggit | Call. |
| Romba. | Thick forest. |
| Sunat | To stray; to miss the way. |
| Sungai. | River. |
| Siue . . . . . | To whistle. |
| Tanah | Earth ; ground. |
| Trop. | To blow. |
| Umbun | Dew. |

"The natives name many birds from a fancied interpretation of their notes, as 'whip-poor-will' with us, c.g. the 'Suip api' or 'Blow the fire' is supposed to call out Antit! Antit! Suip api! (blow the fire), Ambit prick! (take the pot), Jarang nasi ! (cook the rice), Lapat anak! (the child is hungry)."

The nomenclature adopted in the present paper is principally that of Count Salvadori's 'Uccelli di Borneo,' whose pages have been consulted at every turn of its preparation.

# Order ACCIPITRES. 

## Suborder Falcones.

## Family Falconide.

Subfamily Accipitrine.

## 1. Circus spilonotus, Kaup.

Circus spilonotus, Sharpe, Cat. B. i. p. 58 ; id. Ibis, 1877, p. 2.
A new species for Labuan, where Mr. Ussher obtained an immature male in September 1876 and a fine adult male in January 1877. This Harrier was first introduced to the notice of naturalists as a Bornean bird by Mr. Alfred Everett (cf. Sharpe, Ibis, 1876, p. 30). Governor Ussher has also sent it from Brunei, as will be seen by the list of birds published by me in the 'Ibis' for the present year. Mr. Treacher sent a pair of young birds from Labuan, but without indication of the native name beyond the word "Alang," which means "Hawk."

## Subfamily Buteonine.

## 2. Butastur indicus (Gm.).

Butastur indicus, Sharpe, Cat. B. i. p. 297 (1874).
Poliornis indica, Salvad. t. c. p. 9.
Included in his work by Count Salvadori, with a query, no specimen having been sent from Borneo up to the time he wrote. Governor Ussher was therefore the first discoverer of the species irr the Bornean avifauna. Five specimens were shot by him in different plumage in September and October 1876. Mr. Treacher also sends five specimens, and gives the native name as "Alang alap alap." Four of them are fine adult birds; and one is young ; the latter, in addition to the mottled plumage and streaked breast, has five dark brown bands on the tail, much narrower than in the adult. One of Mr. Treacher's skins (the young bird) had the same native name "Alang juali" as the Peregrine Falcon, showing apparently that the natives have a different name for the young bird, or else that the collector mistook it for the young of the Peregrine.

## Subfamily Aquiline.

3 Spizaëtus limnaëtus (Horsfo).
Spizaëtus limnaëtus, Sharpe, t. c. p. 272 ; Salvad. t. c. p. 15.
"Not uncommon, but extremely shy and difficult of approach; it is a great foe to poultry, and also feeds on sheil-fish " (H.T. U.).

Mr. Low sends a nestling, nearly full-grown, which is black all over, like the adult, of which three specimens are in Mr. Ussher's collection. This seems to show that I am wrong in considering the the $S$. caligatus of Raffles to be the young of S. limnaëtus, as I have put forward in my 'Catalogue of Birds' (l. c.) ; but in Mr. Treacher's collection was a young bird in the striped plumage (similar to S. cirratus), with five bands on the middle and seven on the outer feathers. Although I at present keep only one species of Spizaëtus
as inhabiting Labuan, it is quite possible that further observers may recognize more. The species are very little understood, as may be gathered from the recent researches of Capt. Legge into the Ceylonese Spizaëti (cf. Legge, B. Ceylon, pp. 51, 55).

The young bird which Mr. Low forwarded was obtained from the egg, which he opened by cutting the shell in two halves and extracting the small occupant, who lived with him to a good size. He tells me that this Eagle builds on very high trees, and only lays one egg. Two nests which he observed had only one egg in each. That sent on the present occasion was taken in January 1875; it is white, with a few stains of ochraceous brown; axis $2 \cdot 8$, diam. 2.2.

## 4. Haliàtus leucogaster (Gm.)

Haliaëtus leucogaster, Sharpe, Cat. B. i. p. 307.
Cuncuma leucogaster, Salvad. t. c. p. 5.
A young bird was in Governor Ussher's collection from Brunei ; and he has since sent an adult bird shot by his boy Buak in Labuan. Mr. Treacher's collection also contained a fine adult bird, with the native name "Alang piak."
5. Haliastur intermedius, Gurney.

Haliastur intermedius, Sharpe, Cat. B. i. p. 314.
H. indus, Salvad. t. c. p. 12 .

A young and an old bird from Governor Ussher, the latter shot on the Kina Banua river in April 1877. Mr. Treacher sends an old bird (No.46) with the native name "Alang merah," and a young one (No. 27) simply marked "Alang" and apparently not recognized by the collector as the immature bird of the present species. Mr. Low sends an egg of this species taken from a nest in a lofty tree in December 1873 ; it is dull white; axis 1.95 inch, diam. 1.4 .

## Subfamily Falconine.

## 6. Falco peregrinus, Tunst.

Falco communis, Gm., Sharpe, Cat. B. i. p. 376 ; Salvad. t.c. p. 1.
A fine adult bird, of the true $F$. peregrinus type, procured by Mr . Treacher, according to whom it is called "Alang juali." The species has only been obtained before in Borneo by Motley at Banjermassing.

## 7. Cerchneis tinnunculus (L.).

Cerchneis tinnunculus, Sharpe, Cat. B. i. p. 425.
The only Kestrel yet recorded from Borneo is Cerchneis moluccensis, which is said to have been collected by Schwaner (cf. Salvad. Ucc. Born. p. 3). Governor Ussher procured a specimen, which, however, I believe to be the dark form of European Kestrel, known to ornithologists as Cerchneis japonicus. This opinion is confirmed by a second example of a Kestrel obtained by Mr. Treacher in Labuan, evidently of the same species as the one shot by Governor Ussher, and apparently a young male of C. japonicus, with the basal half of the tail commencing to get blue.


#### Abstract

Suborder Pandiones. 8. Pandion leucocephalus, Gould.

Pandion leucocephalus, Sharpe, Cat. B. i. p. 451. Pandion haliaëtus (L.), Salvad. t. c. p. 7. An adult specimen (No. 44) sent by Mr. Treacher, who gives the native name as "Alang piak"-the same, it will be observed, as that applied to Haliaëtus leucogaster. The species was procured at Sarāwak by Doria and Beccari, but has not been previously met with by the English collectors in N.W. Borneo.


## Suborder Striges. <br> Family Strigide.

9. Ketupa javanensis, Less.

Ketupa javanensis, Salvad. t.c. p. 20 ; Sharpe, Cat. B. ii. p. 8.
Two fine specimens, one dated December 1876, were sent by Governor Ussher. Mr. Treacher sends three adult birds, with the native name "Bugang."
10. Phodilus badius (Horsf.).

Phodilus budius, Motl. \& Dillw. t. c. p. 8 ; Salvad. t.c. p. 22.
One specimen was sent by Mr. Low. It has already been recorded as a Labuan bird by Messrs. Motley and Dillwyn; indeed Mr. Motley speaks of it as being rarely seen, but not uncommon in the island. This appears somewhat strange when we consider the diligent efforts of Governor Ussher and Mr. Treacher to exhaust the avifauna of Labuan, and yet neither of them ever procured a specimen. It may, therefore, be migratory, and only plentiful at certain seasons of the year. Native name "Burong hantoo" (Motley).
11. Ninox scutulata (Raffles).

Ninox scutulata, Sharpe, Cat. B. ii. p. 156.
Ninox borneensis, Bp., Salvad. t. c. p. 18 ; Sharpe, P. Z. S. 1875, p. 99.

Of this bird I have now examined a large series sent by Mr. Low, Governor Ussher, and Mr. Treacher, and I have very little to add to the remarks which I published in the 'Catalogue of Birds.' The characters which I there supposed might distinguish the Labuan bird as a race seem to me to be insufficient to warrant this conclusion. The uniform first primary appears to be a matter of age ; and the number of caudal bars probably depends upon the same cause. In Mr. Treacher's series the majority of the specimens have five tail-bars, but one has only four. Native name "Pungok" (Treacher).

Two specimens from Labuan were in Mr. Low's collection; one of them a dark-coloured bird with four bands on the tail, and obsolete traces of fulvous bars on the inner web of the first primary. This belongs to the usual dark Labuan form of this Ninox; and it breeds in the island, Mr. Low having obtained two eggs with this identical specimen. The latter are very small for the size of the
bird, pure white, and measuring-length 0.95 inch, in diameter 0.8 . The second specimen is much paler, and agrees best with the Sarawak bird described in: my 'Catalogue' (p. 164); but it has five bars on the tail. These differences in coloration may be sexual, as the last named bird has a longer wing than the preceding one. Governor Ussher sent several specimens, which bear out the preceding remarks. He says it is tolerably common in Labuan.

## 12. Ninox japonica (T. \& S.).

Ninox japonicus, Wald. Tr. Z. S. viii. p. 40.
Mr. Burbidge during his stay in Labuan procured a specimen of the large Ninox of China and Japan, which seems to migrate to the Malayan archipelago, where it has been called Athene forensis by Mr. Wallace. In the 'Catalogue of Birds' I have given a number of measurements showing that the Chinese bird is as a rule very much larger than the ordinary Ninox scutulata, and that from its wide-extending range it is apparently a migratory bird. Its wing is never less than eight inches, and often exceeds nine, the largest specimen hitherto examined by me having been Mr. Wallace's type of $A$. Aorensis, which had the wing $9 \cdot 1$ inches in length. Mr. Burbidge's specimen exceeds these dimensions, having a wing of $9 \cdot 6$ inches. In view, therefore, of the constantly larger size attained by these birds, I prefer to record the specimen under a different heading from Ninox scutulata, to draw attention more positively to the occurrence in Borneo of this larger species or race.

## Order PSITTACI.

## 13. Paleornis longicauda (Bodd.).

Palcornis lonyicauda, Salvad. t. c. p. 22.
P. malaccensis, Vig.; Motl. \& Dillw. t. c. p. 26.

Native name "Beian" (Treacher).
Governor Ussher writes :-"About April this Perroquet appears to congregate in large numbers, especially the males, uttering loud cries. They then separate, probably for breeding-purposes. The males are extremely handsome and swift of flight."

## 14. Loriculus galgulus (L.).

Loriculus galgulus, Salvad. t. c. p. 26.
Psittaculus galgulus (L.), Motl. \& Dillw. t. c. p. 27.
A peculiarly coloured specimen from Labuan was in Mr. Low's collection. It had the whole of the wing mottled with yellow, ali the feathers being tipped with this colour. This is probably a varicty, as the bird does not appear to be immature, having a distinct patch of bright blue on the crown and the red patch on the lower back well developed. Governor Ussher sends a pair, and adds, "It does not seem to thrive well in confinement." It is also included in Mr. Treacher's collection with the name "Peripas." Mr. Low has forwarded three eggs of this small Parrot or "Love-bird." They
are dull white, stained a geod deal with brown. Two of them are rounded in shape, axis 0.7 inch, diam. $0.6-0.65$; the third is a little more oval, measuring, axis 0.7 , diam. $0 \cdot 55$.
a. Harpactes duvauceli, (Temm.), Sharpe, P. Z.S. 1875, p. 102.
b. Harpactes diardi (Temm.), Sharpe, t. c. p. 102.

To be expunged from the list of Labuan birds.
Family Capitonide.
15. Megalema yersicolor (Raff.).

Megalama versicolor, Motl. \& Dillw. t. c. p. 28.
Chotorea versicolor, Salvad. t. c. p. 33.
One specimen is mentioned as having been seen on the island by Mr. Motley; and Mr. Low sent an example which he told me had been shot on Labuan.

## Order PICARIE.

Family Picide.
16. Xylolepes validus ('I'emm.).

Xylolepes validus, Salvad. t. c. p. 43.
In Governor Ussher's second collection.
17. Alophonerpes pulverulentus (Temm.).

Alophonerpes pulverulentus, Salvad. t.c. p. 51.
One specimen, shot in January $187 \%$ by Governor Ussher. Mr. Treacher also sends one specimen.
18. Thriponax Javensis (Horsf.).

Thriponax javensis, Salvad. t. c. p. 53.
Hemilophus leucogaster (Temm.), Motl. \& Dillw. p. 29.
In the collections of both Governor Ussher and Mr. Treacher. According to the latter it is called "Batatok turkubuk." The Governor says that it is "rather common, and is generally betrayed by the loud noise made by his powerful bill, when searching the trees for food."
19. Tiga javanensis (Ljungh.).

Tiga javanensis, Salvad. t. c. p. 54.
"Not uncommon; habits similar to those of Thriponax javensis" (Ussher). Native name "Ouit souit" (Treacher).

An egg of this species is sent by Mr. Low. It is pure white, and measures-axis 0.95 inch, diam. 0.7 .
20. Yungipicus fusco-albidus, Salvad. $t$. c, p. 42.
T. sondaicus (Wall.), Sharpe, P. Z. S. 1875, p. 102.

Lord Tweeddale has shown (Ibis, 1877, p. 290) that the name fusco-albidus should be employed for this species. Governor Ussher
observes, "Commonly to be seen twisting and climbing up treestems." Native name, according to Mr. Treacher "Burong anie."

Mr. Low procured four eggs of this species. They are pure white, and vary a little in shape, two of them being a little more rounded than the two others: axis $0.65-0.75$ inch, diam. $0 \cdot 55-0.58$.
c. Callolophus puniceus, (Horsf.). Sharpe, P. Z. S. 1875, p. 103.
d. Callolophus malaccensis (Lath.), Sharpe, t. c. p. 103.
e. Graucopicoides raffesi (Vig.), Sharpe, t. c. p. 103.
f. Meiglyptes tristis, (Horsf.), Sbarpe, t. c. p. 103.
g. Meiglyptes tukki (Less.), Sharpe, t. c. p. 103.
h. Micropternus badiosus (Temm.), Sharpe, t. c. p. 103.
i. Sasia abnormis (Temm.), Sharpe, t.c. p. 103.

All the above to be expunged from the Labuan list.

## Family Cuculide.

21. Cuculus himalayanus, Vig.

Cuculus himalayanus, Jerd̉. B. Ind. i. p. 323.
Governor Ussher shot a specimen of this Cuckoo, which forms an interesting addition to the avifauna of Borneo, on the Kina Banua river at the latter end of March. The specimen has been examined by Mr. Seebohm, who has recently studied the genus; and he pronounces it to be undoubtedly of this species.

## 22. Hierococcyx strenuus (Gould).

Cuculus strenuus, Gould, B. Asia, pt. viii. (1856).
Mr. Treacher sends a specimen of an adult Cuckoo, which I have compared with the type in the British Museum, and which I believe to belong to the large Hawk Cuckoo described by Mr. Gould as $H$. strenuus, from the Philippine Islands. The question as to whether this species should be considered to be a distinct one, or whether it should be only reckoned a race of $H$. sparverioides, must be left to future observers who may have a larger series than I have had at their disposal.

The wing in Mr. Treacher's bird is 9.5 inches, measured in a straight line from carpal band to tip of longest primary; and the native name is given as " Wang kulit."

## 23. Chrysococcyx xanthoriynceus (Horsf.).

Chrysococcyx xanthorhynchus, Salvad. t. c. p. 62.
Mr. Low's last collection contained two specimens, shot in Labuan on the 24th of June, 1875. He informed me that the species was very rare in the island, and was unknown to the natives. It is probably only an occasional visitant, as neither Governor Ussher or Mr. Treacher have procured specimens.
24. Surniculus lugubris (Horsf.).

Surniculus lugubris, Salvad. t. c. p. 63.
Governor Ussher's collection contained a young and old bird shot in April 1877. The former was in very interesting plumage, being spotted with white all over the body.
25. Cacomantis merulinus (Scop.).

Cacomantis merulinus, Salvad. t. c. p. 64 .
Gorernor Ussher sends specimens with the following note:${ }^{\text {" }}$ Rare in Labuan, appears about July and August. Habits and flight, as well as note, resemble those of the Golden Cuckoo of West Africa."
26. Eudynamis malayana, Cab. et Hein.

Eudynamis malayana, Salvad. t. c. p. 68.
Eudynamis orientalis (L.), Motl. \& Dillw. t. c. p. 55.
A pair of birds, killed by Governor Ussher in September 1876. Mr. Treacher sends three specimens-one male, one female and a young bird in changing plumage. No native name is given.
27. Centropus javanensis (Dum.).

Centropus javanensis, Salvad. to c. p. 76 .
Sent by Mr. Low, Governor Ussher, and Mr. Treacher. The latter gives the native name as "Terakok."

Mr. Low forwarded an eggg along with the old bird. The egg is white, without gloss, and measures-axis $1 \cdot 25$, diam. $0 \cdot 95$. There is not a great difference in size between the egg of this species and that of $\mathcal{C}$. eurycercus.
28. Centrococcyx eurycercus (Hay).

Centrococcyx eurycercus, Salvad. t. c. p. 78.
Centrococcyx philippensis (IIorsf.), Motl. and Dillw. t. c. p. 54.
Both Governor Ussher and Mr. Treacher send a good series of this Lark-heeled Cuckoo, which is called "Bubut." Mr. Low obtained the eggs, which are dull white, and are rather rounded in shape; nevertheless they vary somewhat in form, the axis ranging from 1.05 to 1.25 inch, and the diameter from 0.95 to 1.05 inch. Mr. Low writes to me that these eggs were taken in Labuan in May 1873, the nest being loosely built near the ground in thick undergrowth. Governor Ussher states that the habits are similar to those of the Lark-heeled Cuckoos of Africa.
k. Rhopodytes erythrognathus (Hartl.), Sharpe, P. Z. S. 1875, p. 104.

1. Rhinortha chlorophcen (Raft.), Sharpe, t. c. p. 104.
m. Poliococcyx sumatranus (Raff.), Sharpe, t. c. p. 104.

To be expunged from the Labuan list.

## Family Bucerotide.

29. Anthracoceros convexus (Temm.).

Buceros convexus, Motl. \& Dillw. t. c. p. 53.
Hydrocissa convexa, Salvad. $t$. c. p. 80.
Native name "Licap" (Treacher). "Shot in jungle near Government House. This bird is common, but very shy. It is found in Daat, Labuan, and Kurāman, and probably in Pappan" (Ussher). Mr. Low sends three eggs of this Hornbill; and he says that two is the number of the eggs laid, and that the female is shut up by the male in a tree; colour white, the texture rather coarse; axis 1.95-2.1 inches, diam. 1•25-1.4.

## Family Upupide.

30. Upupa epors, L.

Upupa epops, Sharpe \& Dresser, B. Eur. part vii. (1871).
Shot on Labuan by Mr. Treacher. His single specimen I have compared with Chinese and Central-Asian specimens; it canonly be a rare visitant to Borneo, as it has never before been met with by any collector.

## Family Meropide.

31. Merops sumatranus (Raffl).
M. badius (Gm.), Motl. \& Dillw. t. c. p. 14 .
M. bicolor, Salvad. t. c. p. 90.

Governor Ussher writes:-"Common ; seems to disappear about June or July, as none were noticed in August; very plentiful in April." Mr. Low sends the eggs; and according to his notes the birds nest in holes in sandy earth, laying five eggs ; the latter are white and glossy, somewhat rounded : axis $0 \cdot 95$, diam. $0 \cdot 85$. The native name given by Mr. Low is "Burong tampakurow," but by Mr. Treacher it is rendered "Berkuru."

## Family Alcedinide.

32. Alcedo bengalensis, Gm.

Alcedo bengalensis, Salvad. t. c. p. 92.
Adult and young birds in Governor Ussher's collection.
33. Alcedo meninting, Horsf.

Alcedo meninting, Salvad. t. c. p. 93.
Rather common, according to Governor Ussher. Mr. Treacher also sends specimens, and gives the native name as "Mantes yan" or "biru." Along with the female bird Mr. Low sends four eggs, which are glossy white and rather rounded ; asis 0.8 in ., diam. $0 \cdot 65$.
34. Pelargopsis leucoclephala (Gm.).

Pelargopsis leucocephala, Salvad. t. c. p. 95.
Of this large Kingfisher, already recorded by Motley as a Labuan
bird, Mr. Low sent an old female caught on the nest with two eggs : the latter are large and white, axis $1 \cdot 5$, diam. $1 \cdot 25$. The native name is "Bukaka," according to Mr. Treacher. Governor Ussher's note is as follows :-" Decidedly not common. I observed one at Tanjong Kubong, but could not get near it. One was given to me by Mr. Low, the others being shot by Buak."

## 35. Ceyx dillwynni.

Ceyx dillwynni, Sharpe, Monogr. Alced. pl. 43, ; Salvad. t. c. p. 99 .
C. tridactyla (nec Linn.), Motl. \& Dillw. t. c. p. 13.
C. innominata, Salvad. t. c. p. 97.
C. sharpii, Salvad. t. c. p. 98.

Native name "Mantis merah" (Treacher).
This species was described by me from Labuan in the year 1868. It has since been plentifully forwarded from that island, and from other parts of Borneo, and from Sarawak. Count Salvadori described a second species in 1869, which he called Ceyx sharpii; and again in the same paper he described the red Three-toed Kingfisher (C. rufidorsa, Strickl.) as C. innominata. This latter name was not adopted by me in my ' Monograph,' as an examination of the type showed that it was the true Ceyx rufidorsa of Strickland. Since the time when Mr. Low sent his first collections, the British Museum has carefully secured all the specimens which have been offered to it of these little rufous Ceyces, whose plumages are so difficult to understand: there is therefore a very fine series of C. dillwynni now in the national collection. Added to the large number of skins in different plumages now sent by Mr. Treacher, I can affirm that the supposition propounded by me in 1875, that Ceyx sharpii is ouly a stage of plumage of C. dillwynni, is now placed beyond all doubt as a fact. Dr. Brüggemann, in his paper on Dr. Fischer's collections from Cèntral Borneo (Abhandl. Nat. Ver. Bremen, v. p. 532), has also given his attention to the species, with a similar result. At the same time the plumages of the species are not easy to follow when the specimens are unsexed, as is unfortunately the case with the entire series in the Museum and in Mr. Treacher's collection. Dr. Fischer believes that there is no difference in the sexes, when the birds are adult, beyond a little greater brilliancy of colouring on the part of the male.

There is no difficulty in believing this to be true, as far as I can see; and all the specimens with varying degrees of blue on the wingcoverts would be individuals in various stages of immaturity, while the red birds (C. rufidorsa), as far as Borneo is concerned, would be still more immature. I fancy that this determination of the progress to maturity is true of the female only; for I think it probable that the latter sex takes longer to effect her progress to the adult plumage than does the male; this is the case in other birds. That the males take less time to gain the full plumage is shown by four specimens in the Museum which have blackish bills (showing that they are young), and which yet have the colours of an adult male, excepting
that the blue on the coverts and scapulars is not so bright. It is obvious that the question can uever be really settled till we have a number of carefully sexed and dated specimens; and meanwhile it may be remarked that great difficulties prevent the final acceptance of the explanation of the plumages above given; for if they are right the females must be in the proportion of at least three to one, judging from the collection now lying before me. Again, as to the fate of C. rufidorsa (of which there are several specimens in Mr. Treacher's collection agreeing exactly with another from Sumatra and another from Malacca), the perfect gradation, as far as the Bornean specimens are concerned, between C. rufidorsa and C. dillwynni, leaves no doubt of the identity of these two species; but then at present we no evidence of the occurrence of C. dillwynni out of Borueo. Ceyx rufidorsa from Malacca and Sumatra may either be a plumage of C. tridactyla or C. dillwynni, or it may be a good and distinct bird. This seems to be hardly likely ; and should it turn out that $C$. dillwynni is found in Malacca and that C. rufidorsa is really synonymous, then the former name must be suppressed.

Mr. Low procured three eggs of this species, along with a female bird in the plumage of C. sharpii, Salvad. As might be expected, these eggs are pure glossy white, axis 0.75 , diam, 0.6 .
> 36. Halcyon coromanda (Lath.).

> Halcyon coromanda, Sharpe, Mongr. Alced. pl. 57.
> Halcyon lilacina, Motl. \& Dillw. t. c. p. 13.
> Callialcyon coromanda, Salvad. t. c. p. 101.

Not very common, according to Governor Ussher. Mr. Treacher says it is also called "Bukaka," like the other kinds of Kingfishers.

Mr. Low sends five eggs of this Kingfisher taken in Labuan in May 1873 : they are pure white, axis $1 \cdot 2-1 \cdot 25$ inches, diam. $1 \cdot 15-1 \cdot 2$. He also adds the following note :-" Burong Sakak, the large red or crimson Kingfisher. The nest is said to be pendulous and invariably to be accompanied in the same mass by a bee which is peculiarly vicious, so that the nest can only be robbed after destroying the bees; in the case of these eggs they set fire to the whole, unluckily." The nesting of this Kingfisher in a bee's nest seems to be a point of some interest.

## 37. Halcyon pileata (Bodd.).

Halcyon pileata, Sharpe, Mongr. Alced. pl. 62.
Entomobia pileata, Salvad. t. c. p. 102.
Governor Ussher writes:-"In September 1876 I saw this Kingfisher in the swamp on the plain, and was near enough to distinguish the colours, but could not get a shot. There can be no doubt as to the identity of the bird, as I have since obtained specimens. It seems to leave in March or April."

The native name given by Mr. Treacher and Mr. Low is "Bukaka." The latter gentleman sends five eggs of this species from Labuan; they are pure white and rounded, axis $1 \cdot 2$, diam. $1 \cdot 0$.

## 38. Halcyon chloris (Bodd.).

Halcyon chloris, Motl. \& Dillw. t. c. p. 13; Sharpe, Monogr. Alced. pl. 87.

Sauropatis chloris, Salvad. t. c. p. 103.
Sent by Governor Ussher and Mr. Treacher. According to the latter gentleman, the native name is "Burong mukichic." Mr. Low renders the native name as "Burong bukikick." He sends three eggs of this species, taken on the 22nd of March; they are pure white, axis $1 \cdot 15-1 \cdot 2$ inch, diam. $0 \cdot 95-1 \cdot 0$ inch. Governor Ussher writes:-" Extremely common everywhere, both close to habitations and in the forest. It is a very noisy bird, and appears to give warning to others of the approach of danger. It has not seldom prevented me from getting a shot at the white Pigeon on Enoe."
39. Eurystonus orientalis (L.).

Eurystomus orientalis, Salvad. t. c. p. 105.
Eurystomus pacificus, Motl. \& Dillw, t. c. p. 11 (nec Lath.).
Governor Ussher writes :-" Very common among the dead foresttrees, but keeps at a great height, hawking after insects, and is consequently not very easy to obtain. It reminds me in its motions of Eurystomus afer and E.gularis of West Africa, though its flight is much more lofty and not so quick as in $E$. gularis."

The native name is given by Mr. Treacher as "Lakei."

## Family Caprimulgide.

40. Caprimulgus macrurus, Horsf.

Caprimulgus macrurus, Salvad. t.c. p. 117.
Caprimulgus salvadorit, Sharpe, P. Z. S. 1875, p. 99, pl. xx. fig. 1.
Native name "Kampa-kampa" (Treacher).
The distinguishing marks, principally consisting of the white edgings to the scapular feathers, which induced me to separate the Labuan bird as Caprimulyus salvadorii, seem to me, now that I have examined a large scries, to be dependent on the age of the individual, and I feel compelled to suppress the species. I do this with great reluctance, as I had attached to it the name of Count Salvadori, with whose excellent work on the birds of Borneo commences quite a new era in the history of Malayan ornithology.

This Goatsucker is the common species in Labuan, and lays two eggs on the ground. The eggs sent by Mr. Low measure about $1 \cdot 3$ inch in length, diam. $0 \cdot 9-0 \cdot 95$; they vary a good deal in shape and in markings, the ground-colour being creamy buff with faint purplish marblings and irregular lines; on some are seen overlying blotehes and spots of brown. Governor Ussher says that it is "very common, pitching about the roads and pastures, making a loud and disagreeable noise at night, resembling the rapid strokes of a hammer on a hollow tree; it lays two eggs amongst dead leaves."
n. Batrachostomus auritus (Temm.), Sharpe, P.Z.S. 1875, p. 101.
o. Batrachostomus javensis (Horsf.), Sharpe, P. Z. S. 1875, p. 101.

To be expunged from the list of Labuan birds.

## Family Cypselide.

41. Cypselus subfurcatus, Blyth.

Cypselus subfurcatus, Salvad. t. c. p. 118.
Sent by Governor Ussher with a note :-"Occasional ; resembles C. affinis of the Gold Coast, frequenting the edge of jungle." This Swift is new to Borneo, being only included in Count Salvadori's work as of probable occurrence in the island.
42. Cypselus infumatus, Sclater.

Cypselus infumatus, Salvad. t. c. p. 119.
A specimen, shot by Governor Ussher on the Kina Banua river, April 1877. It agrees with the type from Banjermassing in the British Museum.

Fig. 1.


Tail of Cypselus infumatus.

Fig. 2.


Tail of Cypselus lowi.
43. Cypselus lowi, sp. n.
C.similis C. infumato, sed multo major, et corpore subtus cineras-
cente et cauda vix furcata distinguendus. Lony tota 5, alce $5 \cdot 3$, cauda 2, tarsi 0.4 .

Governor Ussher writes:-"Not uncommon, but difficult to obtain owing to its lofty flight and rapid gyrations. It is generally found near large trees and forests; and although seen during the day-time, its favourite time for seeking its food seems to be towards sunset and in the twilight." (H.T. U.)

This is a very interesting species, and is a large form of C. infumatus, which, however, is easily distinguished by its smaller size (wing $4 \cdot 6$ inches). It is ashy grey underneath instead of ashy brown, and is recognizable at a glance by its tail being only slightly forked. (See figures 1, 2, p. 333.)
44. Dendrochelidon longipennis (Rafin.).

Dendrochelidon longipennis, Salvad. t. c. p. 122.
Macropteryx klecho, Motl. \& Dillw. t. c. p. 9, pl. iii.
Native name " Layang-layang besar" (Treacher).
"Common, and in considerable numbers at times about Government House. Rapid and graceful in its motions; when wounded, it erects its crest and bites and strikes out at its captor. The chest-nut-cheeked examples are rarer than the others." (Ussher).
45. Dendrochelidon comata (Temm.).

Dendrochelidon comata, Salvad. t. c. p. 123.
Macropteryx comatus, Motl. \& Dillw. t. c. p. 10.
Specimens shot by Governor Ussher in May 1876.
Mr. Low sends a pair of birds with a little nest, about an inch and a quarter in diameter, in which are the remains of a broken white egg, concerning which he sends the following note:-"This bird was brought to me in February 1876 by a Kadhyan, who said he had Fig. 3.


Nest of Dendrochelidon comata, nat. size.
killed it on a low tree or stump, on the south west-side of the island, with a sumpitan or blow-pipe. When he picked it up, he said that the nest which was with it was lying close to the bird with one broken egge in it, and he believed that the bird had been carrying it about with her. This was the first specimen of this pretty Swift I ever obtained ; but I have since got three others."

Mr. Hume's notes on the breeding of the Indian Crested Swift (Dendrochelidon coronata) confirm the small size of the nest in these birds; and he states that the nest could be covered with half-a-crown. The Labuan collector doubtless brought down both bird, nest, and egg in one common overthrow; and the bird falling upon the nest gave him the idea that it had been carrying it about with her.
46. Chetura coracina (Schl.).

Chetura coracina, Salvad. t. c. p. 124.
The Marquis Doria states that this species was very common in all the parts of Borneo visited by him. Governor Ussher, however, says that it is extremely rare in the island of Labuan, whence he only sends two specimens, which are identical with a Malayan bird.
47. Chetura gigantea, Temm.

Chetura gigantea, Legge, B. of Ceylon, p. 314.
Hirundinapus giganteus (Hasselt), Salvad. t. c. p. 124.
Governor Ussher procured this species, and sends a note on its capture :-"My first specimen of this Swift, which appears to be very rare, was brought to a friend in June 1876, at the other side of the island, whilst still alive. It had been, so its finder stated, picked up on the road, having fallen before his feet; it had probably been fighting. I observed one much resembling it near the lines, but out of shot. I have since obtained a second, in April 1877."

This is another species which Count Salvadori prognosticated might be a visitor to Borneo, and in which he has been borne out by the researches of the English naturalists.

Captain Legge compared the Labuan birds and others from Malacca with those procured by himself in Ceylon, and could find no speciñc difference between them.

## Order PASSERIFORMES.

Family Corvide.

## 48. Corone tenuirostris, Moore.

Corone tenuirostris, Moore, Cat. B. Mus. E.I. Co. ii. p. 558.
Corvus enca, pt., Sharpe, Cat. B. Brit. Mus. iii. p. 43.
Sent by Mr. Low. I have already stated (anteè, p. 246), my belief in the distinctness of $C$. tenuirostris from C. enca.
49. Cissa minor, Cab.

Cissa minor, Sharpe, Cat. B. iii. p. 86.
One specimen sent by Mr. Treacher, but without any native name. Seeing that the species occurs for the first time in Labuan, it might be expected to be unknown to the natives. The bird sent agrees with the individuals of this race in the British Museum, and measures as follows: total length 12 inches, culmen $1 \cdot 35$, wing $5 \cdot 2$, tail 6 , tarsus $1 \cdot 6$.
p. Platylophus coronatus (Rafl.), Sharpe, P. Z. S. 1875, p. 107.

Must be expunged from the Labuan list.

## Family Dicruride.

50. Dicrurus annectens (Hodgs.).

Dicrurus annectens, Sharpe, Cat. B. iii. p. 231.
Shot by Governor Ussher in January 1877. Undistinguishable from Malaccan examples. The species has not been recorded from Borneo before, where, however, it cannot be very rare, as several specimens are sent by Govenor Ussher, both from the mainland and from Labuan. Mr. Treacher also sends two specimens, but without any native name attached to them.

## Family Camporhagide.

## 51. Pericrocotus cinereus, Lafr.

Pericrocotus cinereus, Sharpe, Ibis, 1877, p. 19.
"November, 1876."
Several specimens of this interesting bird, which ranges as far as Borneo in its winter migration. It was first added to the Bornean avifauna by Mr. Everett, who procured it at Bintulu; it also occurred in Mr. Low's last collection from the north-west coast.

## 52. Lalage terat (Bodd.).

Lalage terat, Salrad. t. c. p. 145 ; Sharpe, Cat. B. iv. p. 95.
Several specimens of both sexes in Governor Ussher's collection, as well as in Mr. Treacher's. At present the species has not been met with by the English collectors on the mairland, though Beccari and Doria obtained it at Sarawak. Mr. Treacher gives the native names of the males as "Panak panggit bujan." Governor Ussher says it is common in the island.

The native name is given by Mr. Low as 'Burung suip api.' The latter gentleman sends two nests, which are smail and of a shallow cup-shape: they are composed of dry bents interwoven with fragments of moss, spider's webs, and dead leaves. Each nest contains two eggs--the colour of those in the first being pale greenish white, thickly blotched and spotted all over with brown spots, amongst which are mingled here and there a few purplish markings and spots; axis 0.85 , diam. 0.55 . In the second nest the eggs are of a duller white, blotched and spotted as in those first described; axis 0.9 , diam. 0.55 .

## Family Muscicapide.

53. Poliomyias luteola (Pall.).

Poliomyias luteola, Sharpe, Cat. B. iv. p. 201.
Erythrosterna erythaca, Salvad. t.c. p. 127 (nec Blyth).
A fully adult male in Mr. Treacher's collection. From its having no native name attached to it, the species is probably a rare visitant.
54. Xanthopygia cyanomelena (Temm.).

Xanthopygia cyanomelana, Sharpe, Cat. B. Brit. Mus. iv. p. 251.
Cyanoptila cyanomelana (Temm.), Swinh. P. Z. S. 1871, p. 380.
O. cyanomelanura, Blyth, lbis, 1870, p. 164.

A series of this species was contained in Mr. Low's last collection; and Governor Ussher sent several specimens in different stages of plamage. This Flycatcher forms an addition to the Bornean avifauna.
55. Hypothymis occipitalis (Vig.).

Hypothymis occipitalis, Sharpe, Cat. B. iv. p. 275.
H. azurea (Bodd.), Salvad. t.c. p. 133.

Mr. Treacher sends three specimens. Native name "Burong umbun." This is also the name given by Mr. Low, who sends the eggs. The latter are creamy white, rather thickly clouded with bright rufous and with a few underlying spots of purple at the larger end. In one specimen, out of a nest of three, the spots are arranged in a ring round the thicker end. Governor Ussher says that the species is found in Labuan and Daat, but is not very common.
56. Rhipidura javanica (Sparrm.).

Rhipidura javanica, Sharpe, Cat. B. iv. p. 332.
Leucocerca javanica, Salvad. t.c. p. 135.
A series sent by Governor Ussher and Mr. Low; Mr. Treacher also contributes adults of both sexes and a young, with the native name " Langi langi."

The eggs sent by Mr. Low are creamy buff in colour, with a ring of confluent spots about the larger circumference of the egg; the ground-colour of this zone is browner and darker than the rest of the egg, the spots being very distinct and of three colours, ochre, brown, and bluish-grey. In some of the eggs the spots are very distinct ; but in the others they are less clearly marked. The groundcolour of the egg also varies, being in some specimens white, when the zone of spots is also paler. The nests (of which Mr. Low has sent two or three specimens) are small but deep cup-shaped structures, attached to the upperside of a small branch, on which they stand upright: they are composed of slender bents of grass, the outside thickly interwoven with cobwebs, so as to give an effect of concealment to the little structure. One nest is marked by Mr. Low as having been taken on the 23rd of March 1873.
57. Siphia banyumas (Horsf.).

Siphia banyumas, Sharpe, Cat. B. iv. p. 450.
Cyornis banyumas (Horsf.), Salvad. t. c. p. 130.
According to Governor Ussher, this species is only occasionally seen in Labuan. The native name given by Mr Treacher is "Panggit buyan."
q. Philentoma pyrrhoptera (Temm.), Sharpe, P. Z.S. 1875, p. 107.

Must be expunged from the Labuan list
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## Family Turdide.

58. Turdus pallens, Pall.

Turdus pallens, Salvad. t. c. p. 256.
Turdus modestus, Eyton, Motl. and Dillw. t. c. p. 23.
Sent by Governor Ussher and Mr. Treacher ; called, according to the latter, "Burong muncheat." Governor Ussher's two specimens were shot in December 1876.
59. Monticola solitarius (P. L. S. Müll.).

Monticola solitarius, Sharpe, anteà, p. 249.
Governor Ussher shot a specimen, with the blue colour beginning to spread over the red breast, in February 1877. It was previously only known as a Bornean bird from the single bird shot by Mr. Everett at Bintulu in November 1875, and recorded by me as Monticola pandoo (Ibis, 1877, p. 13). A second specimen was procured on Kina Balu by Mr. Burbidge (vide anteà, p. 249), who also possessed an example shot on Burong Island, close to Labuan.
60. Phylloscopus xanthodryas (Swinh.).

Phylloscopus xanthodryas, Seebohm, Ibis, 1877, p. 71.
One specimen forwarded in Mr. Treacher's collection, and identified as the above by Mr. Seebohm. Native name "Suit mulagandie."
61. Locustella ochotensis (Middend.).

Locustella ochotensis, Seebohm, Ibis, 1879, p. 14.
In Mr. Low's last collection was a single specimen of this interesting bird; and my friend Mr. Seebohm tells me that it agrees with the types of Middendorff's species, which he saw not long ago in St. Petersburg. It is evident that Middendorff in his 'Sibirische Reise' figured only the young bird of L. ochotensis, and confused the species with the true Locustella certhiola.
62. Acrocephalus orientalis (T. \& S.).

Acrocephalus orientalis, Salvad. t.c. p. 251.
Specimens were in Mr. Low's collection, which he assured me were from Labuan. Governor Ussher's and Mr. Treacher's birds of this species were from the mainland.

## Fam. Timelinde.

Subfam. Brachypodine.

## 63. Irena crinigera.

Irena criniger, Sharpe, Cat. B. iii. p. 267.
I. cyanea (Begbie), Salrad, t. c. p. 151.

1. puella, Motl. \& Dillw, t. c. p. 23.

Governor Ussher gives the following note :-" By no means rare ; generally to be found on the small species of Ficus, devouring the
berries; extremely noiseless in its flight, and flitting into the thick bush when disturbed; is generally seen from April to September." In the large series which I have now examined from Borneo, I have found the characters on which I separated the species remarkably constant. Native name " Lalu" (Treacher).
64. Pycnonotus analis (IIorsf.).

Pycnonotus analis, Salvad. t.c. p. 197.
A series sent by Mr. Treacher, who gives the native name as "Parak berjambul." It was also a frequent bird in the collections of Mr. Low and Governor Ussher.
65. Pycnonotus plumosus, Blyth.

Pycnonotus plumosus, Salvad. t. c. p. 198.
Sent by Mr. Treacher ; and Governor Ussher says that it is very common.
66. Brachypodius melanocephalus (Gm.).

Brachypodius melanocephalus, Salvad. t. c. p. 201.
Sent by all three collectors. Native name "Piong" (Treacher). As Lord Tweeddale has already pointed out (Ibis, 1877, p. 307), my B. immaculatus (Ibis, 1876, p. 39) is not really to be separated as a species. I had not, at the time I described the bird, examined a sufficient number from Borneo.

## 67. Iora scapularis, Horsf.

Iora scapularis, Salvad. t. c. p. 190.
A specimen sent by Mr. Treacher. Native name "Parak-merapok.
Governor Ussher states that this species is common, uttering a pretty little note, and being frequently found near dwellings. Mr. Low sends a single egg of this species, and it is a very beautiful one : axis 0.8 , diam. 0.65 . The ground-colour is white, obscured, however, by reddish spots, which are much more thickly distributed towards the larger end, where the ground-colour becomes almost invisible. These reddish dots and blotches are interspersed by a few spots of purplish grey, which are more apparent towards the thin end of the egg.
68. Iora viridissima, Bp.

Iora viridissima, Salvad. t. c. p. 192.
Only sent by Governor Ussher. He writes:-"This bird is very scarce. It is the only example I have procured. My specimen was shot by Būak near the Kina Banua river."

## Subfam. Timeliine.

69. Cyanoderma bicolor (Blyth).

Cyanoderma bicolor, Sharpe, Ibis, 1876, p. 40.
C. erythropterum (Blyth), Salvad. t. c. p. 213.

Sent from Labuan by Governor Ussher and Mr. Treacher ; according
to the latter gentleman it is called "Rungent." Governor Ussher says it is "occasional, and not common."
70. Mixornis borneensis, Bp.

Mixixornis borneensis, Salvad. t. c. p. 215.
Appears to be rare, according to Governor Ussher, who has alone met with it.

- 71. Setaria affinis (Blyth).

Setaria afinis, Salvad. t. c. p. 231.
Only sent by Governor Ussher, who records it as "occasional."

## 72. Copsychus ameenus (Horsf.).

Copsychus amœenus, Salvad. t. c. p. 255.
"Very common everywhere; addicted to wooded situations; has a very sweet and full song, which, if it were more sustained, would be equal to that of a Nightingale or Thrush" (Ussher). Native name "Katajio" (Treacher). Mr. Low says that the nest of this Dial-bird is composed of "loose twigs in hollow palm-stems," and that five eggs are laid in a nest, one of which was procured by Mr. Low in January 1874. The same observer sends a series of eggs, which seem to be extremely variable, ranging from a pale greenishwhite egg, mottled and blotched with brown, to an egg on which the dark brown blotches are so thickly distributed as almost to hide the greenish ground-colour of the egg altogether. Between these two extremes every possible intermediate colouring occurs; and the size also varies greatly, the axis ranging from $0 \cdot 9-1 \cdot 1$ inch, and the diameter from $0.65-0.75$ inch.

## 73. Cittocincla stricklandi.

Copsychus stricklandi, Moti. \& Dillw. t. c. p. 20, pl. iv.
Kittocincla stricklandi, Salvad. t. c. p. 253.
A series sent by Gorernor Ussher and Mr. Treacher. Native name
"Pulita sungie" (Treacher). Gorernor Ussher says that it is rarer than the Copsychus, and is generally found in deep forest. Mr. Low had a specimen from the mainland of Borneo; and its occurrence there has been confirmed by Mr. Treacher's collections, which contained examples.
r. Macronyx ptilcsus, J. \& S., Sharpe, P. Z. S. 1875, p. 105.
s. Brachypteryx malaccensis, Hartl., Sharpe, t. c. p. 10\%.
t. Timelia maculosa (Temm.), Sharpe, t. c. p. 105.
u. Pkyllornis somnerati (J. \& S.), Sharpe, t. c. p. 106.
v. Phyllornis cyanopogon, Temm., Sharpe, t. c. p. 106.

To be expunged from the Labuan list.

## Subfam. Cisticoline.

## 74. Prinia superciliaris.

Prinia superciliaris, Salvad. t. c. p. 249.
A series of specimens sent by Govenor Ussher and Mr. Low, the latter of whom forwarded the eggs. The last-named gentleman informs me that the native name is "Burong anchariak," that it forms its nest amongst grass-stems near the ground, and is said to have a very pretty song. The majority of the eggs sent by him were glossy brick-red in colour, some of them being lighter, marbled with deeper red, while others are creamy chocolate; axis $0 \cdot 65$, diam. 0.5 .
75. Orthotomus ruficers, Less.

Orthotomus ruficeps, Salvad. t. c. p. 248; Sharpe, Ibis, 1877, p. 114 .

An adult bird sent by Governor Ussher.
76. Orthotomus cineraceus, Blyth.

Orthotomus cineraceus, Sharpe, t. c. p. 114.
Orthotomus sepium, Motl. \& Dillw. t. c. p. 19.
"Not uncommon; is generally found in very thick jungle and prefers tall trees. I have never noticed it except in copses and wooded situations." (Ussher.)

## Fam. Laniid.e.

## 77. Lanius lucionensis, L.

Lanius lucionensis, Sharpe, Ibis, 1876, p. 43.
Several examples are sent by Governor Ussher from Labuan, as well as others from the opposite coast of Borneo. Mr. Treacher obtained an adult bird, and gives the native name as "Burong rangas."
78. Hyloterpe griseola, Blyth, Salvad. t. c. p. 157.

Native name "Panggit hujan" (Treacher). Mr. Treacher sends one specimen; and the species was also in Governor Ussher's collection, but is believed to be rather rare by the last-named gentleman.

## Family Nectarinidde.

79. Cinnyris pectoralis (Horsf.).

Cinnyris pectoralis, Shelley, Monogr. Cimuyridx, part. vi.
Nectarinia pectoralis, Motl. \& Dillw. t. c. p. ${ }^{5} 5$.
Cyrtostomus pectoralis, Salvad. t. c. p. 170 ).
Sent by Mr. Low, and also by Governor Ussher and Mr. Treacher, in some numbers. According to the latter observer, the native name is "Suit kuchik."

The large series of eggs which Mr. Low has procured shows immense variation in colours. There seem to be at least three types of coloration in the egg : the first has the ground-colour bluish, with
purple spots and blotches generally at the thicker end; this is the rarest type. The second has a greyish-blue ground almost entirely obscured with brown spots and blotches, with a few distinctly indicated spots of darker brown here and there; while the general aspect of the third type of coloration is brown, everywhere clouded with mottlings of darker brown and greenish brown. Between these different forms, however, there is every intervening link.
80. Cinnyris hasselti (Temm.).

Cinnyris hasselti, Shelley, Monogr. Cinnyr. part iv.
Nectarophila hasselti, Salvad. t.c. p. 177.
Governor Ussher states that this species is very common at "Coal Point." Mr. Low sends an egg along with the old male and female bird. The egg is a peculiarly coloured one, being creamy white, with longitudinal streaks of light reddish brown or purplish grey extending nearly the whole length of the egg, and sometimes confluent so as to hide the ground-colour ; axis 0.7 in ., diam. 0.55 in .
81. Calcostetha insignis (Jard.).

Calcostetha insignis, Shelley, Monogr. Cinnyridæ, part iv.; Salvad. t. c. p. 177.

A pair sent by Mr. Treacher with the native name "Suit tonjong." The species also occurred in the collections of Mr. Low and Governor Ussher.

## 82. Ethopyga siparaja (Raffl.).

Ethopyga siparaja, Shelley, Monogr. Cinnyr. part ix.
A. eupogon, Salvad. t. c. p. 174.

Two sets, consisting of two and of six eggs respectively, are sent by Mr. Low. These are most beautiful, the ground-colour being of of a pinky flesh-colour, deepening into richer rufous at the obtuse end, and sparingly spotted and scrawled with dark brown. The two eggs sent by themselves are more uniformly blotched with reddish, the spots being more sparingly distributed; axis 0.55 in ., diam. $0 \cdot 45$. Governor Ussher says that this Sunbird is common in Labuan.
83. Anthreftes majaccensis (Scop.).

Anthreptes malaccensis, Salvad.t.c. p. 178; Shelley, Monogr. Cinnyridæ, part vi.

Nectarinia javanica, Motl. \& Diliw. t. c. p. 17.
A series sent by Governor Ussber and Mr. Treacher., The males have bright yellow breasts. Native name "Suit besar" (Treacher). Mr. Low sends several nests, and says that two eggs only are laid in each nest. The eggs are rery variable, the general type being like that of a Bunting, dull white or purplish grey, spotted and scribbled all over with blackish pencillings. On some of the palercoloured eggs these lines and dots are bolder and more distinct.
84. Anthreptes phenicotis (Temm.).

Anthreptes phrenicotis, Shelley, Monogr. Cinnyr. part. vii.
Chalcoparia cingalensis (Gm.), Salvad. t. c. p. 180.
Nectarinia cinyalensis, Motl. \& Dillw. t. c. p. 16.
Sent by Governor Ussher.
w. Arachnothera chrysogenys (Temm.), Sharpe, P. Z. S. 1875, p. 107.

To be expunged from the Labuan list.

## Family Diceide.

85. Prionochilus everetti, Sharpe, Ibis, 1877, p. 16. (Plate XXX. fig. 1.)

The single specimen sent by Governor Ussher agrees thoroughly with the type; and there is no doubt of the distinctness of this bird from Prionochilus obsoletus, of which a figure is also now given (Plate XXX. fig. 2).
86. Diceum trigonostigma (Scop.).

Diccum trigonostigma, Salvad. t. c. p. 166.
Diçum croceoventer, Motl. \& Dillw. t. c. p. 17.
This bird is also recorded as common in Labuan by Governor Ussher. Mr. Low gires the native name as "Suit binalu," and sends a nest of the species with one egg. The latter is bluish white, with tiny brown specks distributed over its surface, with a few larger spots of darker brown, principally at the large end, but also somewhat scattered over the rest of the egg; axis $0 \cdot 65$, diam. $0 \cdot 45$. Mr. Treacher also sent a series of specimens, and gare the same native name as Mr. Low.
87. Dicaum nigrimentum, Salvad. t. c. p. 165.

Dicæum coccineum, Motl. \& Dillw. t. c. p. 19.
This species seems to be distinct from D. coccineum. It is said to be common in Labuan by Governor Ussher.

## Family Motacillide.

88. Budytes viridis (Gm.).

Budytes viridis, Salvad. t. c. p. 260.
Motacilla cinereocapilla, Motl. \& Dillw. t. c. p. 21.
Native name "Bras bras" (Treacher).
89. Motacilla melanope, Pall.

Motacilla melanope, Dresser, B. Eur. pt. xli.
M. bistrigata, Salvad.t. c. p. 259.
"Very scarce," according to Governor Ussher.
The rarity of this species depends doubtless upon its being a migrant in Borneo ; but it cannot be a common visitor, as Doria only obtained one example, and it has not been sent by Mr. Low in any
of the collections I have examined, nor did it occur in Mr. Treacher's boxes.
90. Anthus gustavi, Swinhoe.

Mr. Treacher gives the name as "Bras bras katan."

## Family Fringillide.

91. Padda oryzivora (L.).

Padda oryzivora, Salvad. t. c. p. 263.
Governor Ussher observes :-"This bird was introduced to the island by Mr. Low ; it has thriven, and is now in prodigious numbers."
92. Munia atricapilla (V.).

Mrunia atricapilla, Salvad. t. c. p. 265.
Amadina sinensis, Motl. \& Dillw. t. c. p. 25, pl. vi.
Sereral specimens sent by all three collectors. This species was introduced by Mr. Low, who forwards a number of eggs, which are dull white like those of the following species, from which they are not to be distinguished.
93. Munia fuscans (Cass.).

Munia fuscans, Salvad. t. c. p. 268.
Along with the eggs of this little Finch, Mr. Low sends a pair of the birds, which he calls the "Black Sparrow." Me says: "This bird, formerly the only one of the Sparrows in Labuan, is now rapidly disappearing before the Black-headed Brown Sparrow (Munia atricapilla) and the Java Sparrom, botl introduced birds." The eggs are dull, lustreless, white; axis $0 \cdot 6$, diam. $0 \cdot 4 \overline{0}$.

## Family Hirundinide.

## 94. Hirundo gutturalis, Scop.

Mirundo gutturalis, Salvad. t. c. p. 125.
Native name "Layang layang kuckie." This species is represented by a single adult specimen in Mr. Treacher's collection; and the native name is given on his authority. From the fact of its having the same vernacular title as the common Swallow of Labuan, $I$. javanica, it is evident that the natives do not recognize the difference between the two species; yet the latter is doubtless the resident Swallow, while the present species will prove in all probability to be only a passing migrant. This is the same bird which I called Hirundo rustica, L., in my paper on Dr. Steere's Philippine collection (Tr. Linn. Soc. new series, i. p. 328). It is, as Count Salradori remarks, very doubtfully distinct from the Common Swallow of Europe, but is apparently smaller, and I have never seen an adult male with the rufous breast of H. rustica. This is the first time that I have seen the species in any collection from N.W. Borneo; but Dr. Beccari procured it in Saramak.
95. Hrrundo javanica, Sparmm.

Hirundo javanica, Salvad. t. c. p. 126.
H. pacifica, Motl. \& Dillw. t. c. p. 10.

Governor Ussher sends the following note :- "Is seen everywhere; affects the sea-shore, and even the open sea at times; builds about houses, but also in old trees; frequently perches on old stumps on the sea-beach; and is fond of swampy localities towards evening, when it flies very low." According to Mr. Treacher, the native name is "Layang layang kuckie."

Mr. Low sends a quantity of eggs taken in May 1873 in Labuan. He says that it also breeds in fissures of rocks. The eggs are white, covered with small reddish-brown and purple spots, chiefly near the thicker end; one of the eggs is very thickly clouded near the obtuse end with reddish and purple; axis $0 \cdot 7-0 \cdot 75$, diam. $0 \cdot 5-0 \cdot 55$. Some of the eggs are much less thickly spotted than others, the spots being quite tiny in many of them; in most the reddish shade predominates; but in a few the dots are nearly all pale purple, with some tiny specks of red.

## Family Artamide.

96. Artamus leucorhynus (L.).

Artamus leucorhymus, Salvad. t. c. p. 140.
A. leucogaster (Valenc.), Sharpe in Rowley's Orn. Misc. iii. p. 1ヶ9.

Governor Ussher writes:-"Very common : frequently to be observed in considerable numbers towards evening, especially after rain, hawking after the insects rising from the damp earth, in company with Rollers and Swifts." Native name "Alap alap" (Treacher). Four eggs of this species are sent by Mr. Low, along with the skin of the old bird. They are creamy-white in colour, with spots of pale brown congregated towards the large end of the egg; there are a few spots and blotches of light purplish grey underlying the brown, and generally collected at the thicker end; the amount of spotting varies on each egg ; axis 0.95 , diam. $0 . \%$.
x. Cymbirhynchus macrorhynchus (Gm.), Sharpe, P. Z. S. 1875, p. 107.
y. Eurylamus ochromelas, Raffl., Sharpe, t.c. p. 107.

Both the above-named species must be expunged from the Labuan

## Family Sturnide.

97. Calornis chalybeus (Horsf.).

Calornis chalybeus, Salvad. t. c. p. 271.
Calornis panayensis, Motl. \& Dillw. t. c. p. 24.
Native name "Langkir" (Treacher). Governor Ussher's note is as follows :- "Perhaps the commonest bird in Labuan at this season (August, September, and October); and previous to May they roost in countless thousands in the trees near Government House. They
are very noisy, and are fond of associating with the Pigeons in the dove-cot, where I believe they also breed. They will nest occasionally under the eaves of houses; and one pair built its nest and reared its young this year in the verandah in a blind or screen which is kept rolled up, forming a hollow inside."

Two sets of eggs were procured by Mr. Low with the old birds. The first contained only a single egg, the latter being long in shape, of a light greenish blue, sparsely spotted wian faint underlying spots of brown and larger spots and blotches of red, principally distributed at the obtuse end ; axis $1 \cdot 15$, diam. $0 \cdot 7$. The second set consisted of three eggs not so elongated as the first, and somewhat more plentifully spotted with red as regards two out of the three; axis $1 \cdot 05$, diam. 0.75 . The eggs were obtained in June 1873.
98. Gracula javanensis (Osb.).

Gracula javanensis, Motl. \& Dillw. t. c. p. 25; Salvad. t. c, p. 274.

According to Mr. Low, this bird is called by the natives "Burong tiong;" and the eggs are said to be very difficult to get. The two sent by him are pure white, and are large for the size of the bird ; axis $1 \cdot 3$, diam. 1•15; they were obtained in May 1874.

## Family Pittide.

99. Pitta muelleri (Bp.).

Pitta muelleri, Salvad. t.c. p. 240.
Sent by all three naturalists. Native name "Teong tanah," according to Mr. Treacher. Five eggs are sent by Mr. Low, along with the old female. Their ground-colour is creamy-white, rather thickly scribbled over with reddish-brown lines and spots, and plentifully varied with underlying spots of light purple ; axis $0.95-1.0 \mathrm{in}$., diam. 0.8 in .

## Order COLUMBE.

100. Chalcophaps indica (L.).

Chalcophaps indica, Salvad. t.c. p. 299.
One specimen sent by Governor Ussher, with a note :-" $\frac{q}{}$ Dove : Labuan. Five of these were brought to me alive; but one night a cat got at them, and only left this female. The males were lavendercoloured, grey about the head and neck."

To Mr. Burbidge I am indebted for the following interesting notes and sketches :-
"Herewith I send you sketches and a short account of the 'callwigwams' used by the Kadyans (a pastoral race who live in N.W. Borneo) in order to capture the small green 'Puni' Pigeon.
"The call is formed of two pieces of bamboo (a), a slender tube (b), a short piece $3^{\prime \prime}-4^{\prime \prime}$ in diameter, and a connecting picce of wood $(c)$.

At $b$ is a hole similar to the embouchure of a flute; and the lower end of the blow-tube, $a$, is fitted to this in such a manner that, on blowing at $a$, a soft, low, flute-like 'cooing' is easily producible; and this can be readily modulated so as to be heard either at a long distance or near at hand. The native, who has taken up his position in the forest or jungle where these little birds are found, blows very softly at first; but if there be no answering call from the birds he blows louder and louder, thus increasing the radius of sound. If there really be any Pigeous of this kind within hearing, they are sure to auswer ; and then the hunter blows softer and softer until they are enticed into the 'wigwam' of leafy branches which he has erected in order to conceal himself from sight. The door or entrance to

Fig. 4.

'Dakut' or call used by the Khadyan natives.
these 'wigwams' is partially closed by a screen of palm (Nipa fruticans) leaves. This is elevated a little (as shown in my sketch) to allow the Pigeons to enter, after which it is allowed to fall, port-cullis-like, entirely, so as to close the entrance; and the bird is then easily secured. Above the entrance two holes are made, so that the hunter can look out without being seen. These huts are formed of a few poles or sticks, rudely thatched with twigs and palm-leaves, and vary from four to six feet in height.
"This Pigeon is migratory, and arrives in Labuan and on the opposite Bornean coast with the change of the monsoon, about April. Many hundreds are then caught by means of this 'dakut,' or 'bamboo call,' and are offered for sale by their captors for a cent or two each. They are also kept by the natives as domestic pets, along with young Hornbills, the ' Mina' bird or 'Grackle,' a small species of Parrakeet, and Java Sparrows."

## 101. Treron vernans ( $L_{o}$ ).

Treron vernans, Motl. \& Dillw. t. c. p. 30 ; Salvad. t. c. p. 286.
"Plentiful everywhere; feeds on fruits and berries" (Ussher). Native name " Punic kurackow ' (Treacher).
102. Treron olax (Temm.).

Treron olux, Salvad. t.c. p. 289.
Governor Ussher writes:-" Not so common as T. vernans, but occasionally to be met with. It is of similar habits, but more retiring than the above-mentioned bird." Native name "Punie suit" (Treacher).

## 103. Calemas nicobarica.

Calonas nicobarica, Sharpe, P. Z. S. 1875, p. 110.
Governor Ussher observes, in a letter dated August 5th, 1877, "Būak has succeeded in establishing two additional birds for Labuan. One is the grey-and-white Eagle (H. leucngaster); and the other is the beautiful green-hackled Pigeon (Calcenas nicobarica), two fine specimens of which he got on Pappan Island, a mile from the harbour. Low had two in confinement, but could tell nothing of them. Rajah Brooke had one alive in Sarawak. Two I saw from Saigon ; and I sent you one from Brunei; and now it is established in the Labuan list. I was sure that I had seen it in Enoe and Burong Islands; now it is a certainty." Since the Governor's return to England, Mr. Treacher has procured this bird on the island of Labuan itself, where I had heard of its occurrence also from Mr. Burbidge. The native name, according to Mr. Treacher, is "Jan junli."
104. Ptilopus jambu (Gm.).

Ptilopus jambu, Salvad. t. c. p. 289 ; Elliot, P. Z. S. 1878, p. 5.54.
Governor Ussher sends a specimen of a male. "This lovely Pigeon was shot in August of this year, 1876, near the Kina Banua river, towards the southern end of the island ; have not observed it before, nor noticed it in Mr. Low's collections. I know nothing of its habits, and did not obserse it before August."

## 105. Carpophaga enea (L.).

Carpophaga anea, Salvad.t.c. p. 230.
"Common in Labuan and its islands, but shy and difficult of approach. At certain seasons it feeds roraciously on the fruit of the many varieties of the Ficus indicus in these parts, and swallows the fruit whole: the latter is about as large as a sloe-berry ; and I have found their crops full of them." (Ussher.) Mr. Low sends a single egg, which is pure white; axis 1.7 in ., diam. 1.25 in .
106. Carpophaga bicolor (Scop.).

Carpophaga bicolor, Salvad. t. c. p. 292.
Carpophaga luctuosa, Motl. \& Dillw. t. c. p. 31.
Governor Ussher observes:-"This lovely bird (the beauty of
which in life is faintly represented by the skinned specimens) has only been seen by me on the island of Enoe, about two miles and a half from Victoria, although a friend of mine appears to have seen it on the island of Daat, and it is said to occur in Labuan itself. It is generally in company with another Pigeon, and at times I have seen a dozen or twenty together, at others scarce one. The island of Enoe itself cannot exceed three acres in extent; but I have seen several kinds of Pigeons on its lofty trees. The feathers of this Pigeon, when freshly shot, have at their root a deep buff or golden tinge, which fades, like the pink shade on the breast of some Terns, after death. It feeds on fruits and berries." (H. T'. U.)

Mr. Low's collection contained the eggo of this Pigeon: it is large, pure white, axis 1.9 in ,, diam. 1.4 in . The native name is giren by him as "Burong rawa." Mr. Treacher gives it as "Peagam rawa."

## 107. Spilopelia tigrina (Temm.). <br> Spilopelia tigrina, Salvad. t. c. p. 296.

Governor Ussher observes:-" This pretty bird, now plentiful in Labuan, was introduced to the Bornean coast a few years since by Mr. Low. It has thriven prodigiously, as it is rarely molested, except by the youngsters from the men-of-war who call here occasionally. It is always to be found about paths and by the road-side."

The eggs sent by Mr. Low are pure white; axis $1 \cdot 05-1 \cdot 15 \mathrm{in}$., diam. $0 \cdot 8-0 \cdot 85$. They were taken in January 1873 ; and he gives the native name as "Burong terkukur."

## Family Megapodidez.

108. Megapodius cumingi, Dillw.

Megapodius cumingi, Motl. \& Dillw. t. c. p. 32; Salvad. t. c. p. 302.

Megapodius lowii, Sharpe, P. Z. S. 1875, p. 111.
Native name "Menambrun" (Treacher). Mr. Ussher sends the following note:-" Not uncommon. I have seen its nests on Kuraman, but they are to be seen also on Labuan and Daat. The mounds appear to be about four or five feet in height and about twelve feet in circumference, composed of earth and rubbish. The iris in the living bird is brown; the skin about the eye and cheeks pink or roseate."

The late Marquis of Tweeddale, in his paper on Mr. Ererett's Cebu collections (P. Z. S. 187\%, p. 766), has referred to my naming the Labuan Megapode after Mr. Low, and has pointed out an evident error which I made in describing it as new. I was misled by the opening sentence of Mr. Dillwyn's treatise (p. 32):--"Some specimens of these birds are in the British Museum, to which they were presented by Mr. Cuming, having been collected by that gentleman in the Philippine Islands; in Labuan they are not uncommon," \&c.; as well as by his naming the species after Mr. Cuming. He writes, however, to Lord Tweeddale that the bird he really described came from Labuan, so there is an end of the question. The measurements also bear out the correctness of his statement.

## Family Perdicide.

## 109. Excalfactoria chinensis (L.).

Excalfactoria chinensis, Salvad. t.c. p. 311.
Sent by Governor Ussher and Mr. Low. The former writes :"Tolerably plentiful in open spaces in short thick grass: is met with up to May or beginning of June in little bevies; after that I observed them in pairs. They are of rapid flight, and are hard to flush a second time."

Mr. Low sends a number of eggs of this species. They vary from dark olive-brown with few black dots, to pale olive-brown where the black dots are more numerous. The eggs were taken by Mr. Low in January 1873. Native name "Burong puyu puyu." Axis 1.0 in ., diam. 0.75 in .

## Order GRALLE.

Family Charadridea.
110. Charadrius fulvus (Gm.).

Charadrius fulvus, Salvad. t.c. p. 312.
Charadrius virginicus, Motl. \& Dillwv, t.c. p. 57.
Native name "Pimping" (Treacher). Governor Ussher's specimens were obtained in October 1876.
111. Egialitis peronit (Temm.).

Ayialitis peronii, Salvad. t. c. p. 315.
Charadrius alexandrinus, Motl. \& Dillw. t. c. p. 57.
Governor Ussher writes:-" Not uncommon, but rather solitary. Generally seen aloue on the beach, but sometimes in couples." Mr. Treacher sends several specimen with the usual name, "Pimping," which seems to be applied to all the small Waders.

The eggs of this little Plover were contained in Mr. Low's collection. They were two in number; axis $1 \cdot 25-1 \cdot 3$ in., diam. 0.85 in. The colour is creamy buff, thickly scribbled over and blotched with blackish brown or black, more especially at the larger end ; there are also numerous scribblings of pale purplish grey underlying the black markings.
112. Egialitis geoffroyi (Wagl.).

Egialitis geoffroyi, Harting, Ibis, 1870, p. 378, pl. xi. ; Salvad. t.c. p. 318.

Forwarded by Governor Ussher, with the note that it is occasionally seen on sand-spits and rocks in small flocks. First noticed in July.
113. Egialitis dubia (Scop.).

Egialitis dubia, Salvad. Ucc. Born. p. 316.
Mr. Treacher procured a specimen of the Little Ringed Plover, which has been already recorded from Borneo; and Mr. Alfred Everett obtained it at Sibu; but it has not been met with in Labuan before.

## Family Glareolide.

114. Glareola orientalis, Leach.

Glareola orientalis, Salvad. t.c. p. 319.
An adult bird, in Governor Ussher's collection, killed December 1876. The native name, "Tara-tara," is given by Mr. Treacher, who also sends an adult bird.

## Family Hematopodide.

115. Strepsilas interpres (L.).

Strepsilas interpres, Salvad. t.c. p. 320.
Some young birds sent by Governor Ussher, who killed them in September 1876.

## Family Scolopacide.

116. Tringoides hypoleucus (L.).

Tringoides hypoleucus, Motl. \& Dillw. t. c. p. 60; Salvad. t. c. p. 326.

Adult and young specimens sent by all three collectors. Native name "Pimping". (T'reacher).
117. Totanus glareola (L.).

Totanus glareola, Salvad. t. c. p. 327.
Sent by Governor Ussher.
118. Totanus calidris (Gm.).

Totanus calidris, Salvad. t. c. p. 328.
Two specimens, in Governor Ussher's collection.
119. Totanus incanus (Gm.).

Actitis incanus, Finsch \& Hartl. Faun. Centralpolyn. p. 182.
A single specimen, shot by Governor Ussher in December 1876.
120. Numenius uropygialis, Gould.

Numenius phcoppus, Salvad.t.c. p. 333.
Governor Ussher writes:-" Not very common, as a rule, about Labuan. I obtained three out of a flock at the mouth of the Kina Banua river about four miles from Victoria, but by a chance shot at about sixty yards. In the 'Plover season' they will associate with the latter, and are then more numerous."
121. Gallinago stenura (Kuhl).

Gallinago stenura, Salvad. t. c. p. 334.
Native name "Pimping" according to Mr. Treacher.
122. Gallinago stenura (Horsf.).

Gallinago stenura, Salvad. t. c. p. 334.
Shot by Governor Ussher in September 1876.

## Family Rallide.

123. Hypotenidia striata (L.).

Hypotanidia striata, Salvad. t.c. p. 336.
Sent by all three collectors. Mr. Low has also procured the eggs, of which he has sent a series; the native name is "Burong patikan," according to him. The eggs are creamy-buff, with reddish dots and blotches and underlying paler spots of purplish grey; the style of marking is irregular, as sometimes the reddish and purple spots are found evenly over the surface of the egg, while in others the paler purplish spots predominate, and the reddish marks are distributed over the thicker end of the egg. Axis $1 \cdot 3-1 \cdot 4$, diam. $1 \cdot 0-1 \cdot 1 \mathrm{in}$.

## 124. Rallina fasciata (Raff.).

Rallina fasciatu, Salvad. t. c. p. 337.
In Governor Ussher's collection, as well as Mr. Treacher's; according to the latter gentleman the native name is "Patikan."

## 125. Erythra pheenicura (Penn.).

Erythra phcenicura, Salvad. t. c. p. 340.
Gallinura phonicura, Motl. \& Dillw. t.c. p. 60.
Native name "Karuak" (Treacher). "Common in swampy places, where it rises a first time, but it is difficult to flush again" (Ussher).

Several eggs are in Mr. Low's collection. They are of the usual Water-hen type, buff with reddish brown spots and small blotches distributed over the greater part of the egg, interspersed with dull purplish grey underlying spots. Two specimens are remarkable for the minuteness of the spots, which are principally collected at the larger end. Axis $1 \cdot 5-1 \cdot 6 \mathrm{in}$, diam. $1 \cdot 05-1 \cdot 15 \mathrm{in}$.

## Family Ardeidie.

126. Ardea purpurea, L.

Ardea purpurea, Motl. \& Dillw. t. c. p. 34.
Mr. Motley mentions his having met with the Purple Heron once in Labuan.
127. Demiegretta sacra (Gmı).

Demiegretta sacra, Salvad. t. c. p. p. 346.
Ardea jugularis, Motl. \& Dillw. t. c. p. 58.
Native name "Kanowie Kelam" (Treacher). "Generally found in freshwater swamps; not uncommon; I have obsersed several near Victoria" (Ussher).
i28. Herodias nigripes (Temm.).
Herodias nigripes, Salvad. t.c. p. 349 .
Ardetta garietta?, Motl. \& Dillw. t. c. p. 35.
" Like Butorides javanica, moderately common on the sea-shore (Ussher).
129. Butorides jatanica (Horsf.).

Butorides javanica, Salvad. t. c. p. 351.
Butorides macrorhyncha, id. t. c. p. 353.
Ardea javanica, Motl. \& Dillw. t. c. p. 59.
Governor Ussher says that this species is "moderately common about rocks on the sea-shore." According to Mr. Treacher the native name is " Ulun tukugong."
130. Ardetta cinnamomea (Gm.).

Ardetta cinnamomea, Salvad. t. c. p. 354.
Two adult specimens, sent by Mr. Treacher.

## Order ANSERES. <br> Family Pelecanide.

131. Tachypetes aquila (L.).

Tachypetes aquila, Sharpe, Report of the Transit- of-Venus Exped., Birds of Kerguelen, p. 51.

Mr. Treacher sends one specimen of the large Frigate-bird from Labuan with white head and white breast. Native name "Alang zambongau."

## 132. Tachypetes minor (Gm.).

Tachypetes minor, Salvad. t. c. p. 364.
This species was included by Count Salvadori in his work as a bird likely to be met with in Borneo. An adult and a young specimen are sent by Mr. Treacher, with the same native name as the larger Frigate-bird. The red colour of the bill and the much shorter wings and toes induce me to beliere that the smaller Frigate-bird is a good species, which I was inclined to doubt when I wrote my report on the Kerguelen birds.
133. Plotus melanogaster (Penn.).

Plotus melanogaster, Salvad. t. c. p. 367.
Sent by Governor Ussher.
134. Sula piscatrix (L.).

Sula piscatrix, Salvad. t. c. p. 368.
Native name "Kulu kulu" (Treacher). Mr. Treacher's specimen is a young bird in brown plumage. The species is new to Borneo, though included by Count Salvadori as a bird likely to occur.

> Family Laride.
> Subfam. Sternine.
135. Sterna bergif, Licht.

Sterna bergii, Saunders, P. Z. S. 1876, p. 657.
Sterna cristata, Steph., Salvad. t.c. p. 376 ; Motl. \& Dillw. $t . c$. p. 61.

Native name "Tara tara" (Treacher). Governor Ussher's colProc. Zool. Soc.-1879, No. XXIII.
lection contained this species as well as Mr. Treacher's; but it was already recorded from the locality by Motley and Dillwyn.
136. Sterna melanauchen, Temm.

Sterna melanauchen, Saunders, P. Z. S. 1876, p. 661.
Common in April, May, and June, according to Governor Ussher.
137. Anous melanogenys, Gray.

Anous melanogenys, Sharpe, Report Trans. Venus Exped., Birds of Rodriguez, p. 10.

One adult specimen sent by Mr. Treacher. Native name "Tara tara." I have shown the specimen to Mr. Howard Saunders ; and he confirms the identification.
3. On the Conformation of the Thoracic Extremity of the Trachea in the Class Aves.-Part I. The Gallinæ. By A. H. Garrod, M.A., F.R.S., Prosector to the Society.
[Received October 31, 1878.]
Inspection of the windpipes of several species of allied birds makes it evident that the bifurcation of that tube to form the bronchi is brought about in different ways in almost every case, by various alterations of greater or less degree in the proportionate development of the several rings and semirings entering into the composition of the organ. In the case of the non-oscinine Passeres, Johannes Müller has proved the great importance of the study of the "lower larynx" or syrinc in the determination of the affinities of the species. In the present communication it is my desire to continue his line of investigation to other families of the class, laying more stress on the cartilaginous structures, and less on the muscles moving them. Opportunities are specially in favour of my studying the Gallinæ at the present time ; therefore this first fasciculus is an account of the bifurcating windpipe in those species of the Order which it has been my good fortune to examine.

By C. J. Temminck, in his valuable 'Histoire Naturelle Générale des Pigeons et des Gallinacés' ${ }^{1}$, several of the windpipes of the Gallinæ are figured. These will be mentioned when the respective species are discussed.

It is in the Peafowl that the thoracic termination of the trachea is less complicated, as far as my experience goes, than in any other Gallinaceous bird; and the arrangement is so simple that it is not easy to imagine one much more $\mathrm{so}^{2}$.

In the chick (a month old) of Pavo spicifer (figs. 1, 2) the antepenultimate tracheal ring is free, and agrees with those above it in that the interannular intervals are reduced to a minimum, at the same time

[^13]that anteriorly it is slightly bent downwards in the middle line, to assist in the changes of form connected with the bifurcation of the tube. The penultimate ring, from its position, is more pronounced in this respect, whilst posteriorly the pessulus runs up to blend with it, not at its inferior margin, but by a wedge-shaped cartilaginous expansion, the apex of which touches the lower margin of the ring above. That this is so is proved by the existence of two oblique indented lines, one on each side, converging superiorly, where they nearly meet to form the apex of the just-mentioned wedge. The last tracheal ring anteriorly sends down an obtuse median process, the inferior margin of which constitutes the summit of the notch

Fig. 1.


Front view.

Fig. 2.


Back view.

Pavo spicifer (adult).
N.B.-This and all the subsequent diagrams are drawn to one scale, and have no relation to the actual size of the structures.
between the divaricating bronchi, whilst its posterior surface forms the anterior attachment of the pessulus. Posteriorly this ring is incomplete, the two obliquely truncated ends being separated by a considerable interval occupied by the pessulus in the middle line, and laterally by the commencement of the membranous inner walls of the bronchi.

In the middie of the upper border of the penultimate ring anteriorly a white line is seen sending a limb down on either side, beyond the ring itself, onto the next, at the lower margin of which it ceases at the root of the obtuse median process. Such an appearance indicates that in the older bird fusion of the two rings will occur at the spot, as an inspection of the part in the adult verifies. From the above description it will be also seen that the pessulus a slender cylindroid bar, expanded and flattened at each end-is anteriorly attached to the last, and posteriorly to the penultimate
ring of the trachea. The last tracheal ring, it must not be forgotten, is incomplete behind.

The first bronchial semiring-for in no Gallinaceous birds are any of the bronchial rings complete-articulates at both its extremities with the last tracheal, anteriorly along the side of the oblique median process, posteriorly with the lower angle of its square-cut termination. Both ends are slightly expanded and obliquely truncated, their acute upper angles being their articulating spots. The lower margin of the last tracheal ring being concave downwards and slightly uptipped laterally, whilst the first bronchial semiring descends slightly from its attachments outwards, a considerable membranous interannular interval is left. The second bronchial semiring is simple, free, and slightly expanded posteriorly. In front the third was bifurcated in both bronchi, on one side each branch being further subdivided. The depth of the bronchial interannular membranes is about the same as that of the semirings themselves.

Between the membranous inner wall of one bronchial tube and the same part of the other there is a dense fibrous band of union, a short distance below the bifurcation of the windpipe, and generally on the level of the two or three semirings below the second. This band is, I believe, always to be found in birds (it will be termed the bronchidesmus in this communication) developed to a greater or less extent. Being of fibrous tissue and connected with the membranes of the neighbourhood, anatomists have removed it whilst dissecting the organ for examination. Its importance, however, is more considerable than might be at first imagined; and I only regret that in many of the subjoined descriptions I took no note of it. In birds like the Tetraonidæ the bronchidesmus is so strong that it cannot escape special observation.

The adult female presents no modifications of importance. The penultimate and last tracheal rings are relatively a little smaller and have blended in front in the middle line, whilst all trace is lost of the shape of the posterior termination of the pessulus. The articulating surfaces of the first bronchial semiring have become slightly more considerable.

The adult (male) P. nigripennis differs in that the antepenultimate tracheal ring blends anteriorly with the penultimate, at the same time that there is a greater fusion between the penultimate and last rings, all three apparently blending behind as well. The interamular interval between the last tracheal ring and the first bronchial semiring is reduced to little more than a line, and the bronchial interannular intervals are very small.

It is to be specially noted that in the genus Pavo the second bronchial semiring, by not articulating with the one above it at either end, does not participate in the formation of the specialized lower larynx. This is a feature indicating non-elaboration of the organ. No other Gallinaceous bird with which I am acquainted resembles Pavo in this respect.

In Caccabis rufa the thoracic extremity of the trachea is perfectly
simple, and all the rings are in contact with those contiguous to them throughout their circumference. The lower margin of the penultimate ring faces slightly outwards on either side, whilst in the middle line in front it fuses with the ring below it, a well-defined semiellipsoid ossification developing in the region, upwards as far as the upper margin of the penultimate ring, and downwards to the median point of bifurcation of the last ring, from which it extends laterally a short distance. The pessulus is attached as in Pavo. It is ossified, the anterior termination being the ossification just described; the posterior is a triangular extension into the middle of the posterior surface of the penultimate ring, the apex of which reaches its superior margin. The first bronchial semiring is con-

Fig. 3.


Front view.

Fig. 4.


Back view.

Caccabis chukar.
cave upwards, and in frout forms a sharp inturned angular process at the spot where it articulates with the anterior extremity of the second semiring. Posteriorly its articular upward-directed process is more developed-so much so that the contour line of the posterior extremity of the last tracheal is continuous with that of the ring under consideration and the next as well. The second bronchial semiring differs but little from those which follow it, except in that it articulates with the one above. Its extremities are somewhat more expanded, and articulate freely with the angles of the first ring. Anteriorly it sends inwards a pointed angular process, which advances further towards the middle line than does the similar angle of the semiring above, with which it closely articulates. The semirings which follow have
also pointed anterior ends, running inwards almost as much as does the second, in a manner very characteristic of all the genera in which the second semiring is pointed and prolonged. There is no trace of any interval between the penultimate and last tracheal rings. Between the last and the first bronchial semiring the interval is a capacious ovoid. That between the first and second bronchial semirings is elongate and shallow, not deeper than the lower bronchial intervals. Caccabis saxatilis agrees with C. rufa, except that in the former there is a slight development of antero-lateral interamular intervals between the lower tracheal rings, as in Aryus, the account of which follows.

In Argus giganteus the lowermost tracheal rings are separated by

Fig. 5.


Front view.

Fig. 6.


Back view.

Argus giganteus.
narrow intervals in front, where in the middle line the last three fuse and ossify into a mass whose lower border descends but little below the level of the inferior margin of the unmodified last ring for the articulation of the anterior extremities of the first bronchial semirings. Posteriorly the pessulus joins the penultimate ring, the two hinder ends of the last ring being well separated. The first bronchial semiring is large and strongly convex downwards from the development at each of its ends of upturned articulating processes, at the junction of which with the horizontal portion of the tube the second semiring articulates along its lower border. The interval between each lateral element of the last tracheal ring and its corresponding first bronchial semiring is considerable, tending to a quadrate form, whilst that between the first and second semi-
ring is much narrower and meniscoid. The second semiring itself is strongly convex downwards, articulating behind by its extreme end with the ring above, but in front continuing onwards as a triangle beyond the articular point into the internal bronchial membrane a short distance. The anterior terminations of the few lower bronchial semirings are similarly pointed; and posteriorly they run inwards (especially the fourth and fifth) considerably more than do semirings one and two.

Polyplectron chinquis so closely resembles Argus in all respects that no description of it is needed. The first and second bronchial semirings are proportionately a little stronger; the antepenultimate tracheal ring does not actually fuse with the penultimate, and in one specimen the pessulus, instead of blending with the penultimate ring behind, runs upwards cuneately between the separated ends of that ring to touch the lower margin of the antepenultimate ring. From this and other facts pointing in the same direction, to be mentioned subsequently, it may, with much probability, be inferred that this arrangement just mentioned is the typical one, consolidation of the pessulus with the posterior extremities of the penultimate tracheal ring having occurred in those cases where, among the Gallinæ, that bar is found connected with it.

In Ithayinis geoffroii ( $\delta$ adult) there is a transversely fusiform median interannular interval between the lower tracheal rings anteriorly, entirely absent behind. The antepenultimate and penultimate rings are slightly separated throughout, most at the sides, whilst between the penultimate and last rings-fusing though they do in the middle line anteriorly-there is a slight elongated oblong interval on either side of the fused isthmus, extending outwards as far as the lateral margin of the tube, but not further backwards. The pessulus gives no indication of separation from the penultimate tracheal ring posteriorly, whilst anteriorly it springs from the last ring, between which and the first bronchial semiring there is a considerable interval. This semiring is somewhat squared, sending up processes (an anterior and a posterior) of no great length to articulate with the last tracheal ring, the second semiring (scarcely differing from the third) just touching its two angles sufficiently for it to be said that it does articulate with it. In this species the lateral sterno-tracheal muscle terminates inferiorly in a peculiar manner. It is constituted of two parts, an outer and an inner. Of the inner, which is also divided below into two, the median portion ceases at the twelfth ring from the bifurcation, opposite which spot its outer moiety sends downwards a special thin extra broad fasciculus to join the undivided outer main element of the muscle just before it leaves the windpipe, opposite its antepenultimate ring. The nerve to these lower fibres is not small; and from being super-ficial-resting as it does on the muscles under consideration as they descend-it disappears behind the special fasciculus above described at the spot where that begins to run inwards towards its fellow, which it does not meet.

In Lophortyx californicus (adult male) there are no interannular
intervals on the posterior aspect of the intrathoracic portion of the windpipe [as in so many of the birds under consideration, and dependent, no doubt, upon the proximity of the œsophagus]; but anteriorly the lowermost twelve rings are thinned in such a way that the intervals are uniform and deeper than the rings forming them, at the same time that their breadth is half the circumference of the tube itself, they continuing auross the middle line, except in the case of the lowermost three, which are divided up by median junc-

Fig. 7.


Front view.

Fig. 8.


Back view.

Lophortyx californicus.
tions of the rings, narrow and not fused between the antepenultimate and the one above it, broad and blended in the two below it. There is a narrow medio-anterior vertical fibrous bond between all the upper thinned rings, taking the place of the lower cartilaginous isthmuses. Posteriorly the penultimate and antepenultimate rings blend in the middle line, the pessulus joining the former in the usual manner. The last ring is typical and incomplete behind. The first bronchial semiring is large and concave upwards.

It develops a considerable angle on its convex border in front, at the spot where the next semiring meets it. Behind it is peculiar from its inconsiderable thickness, it meeting the corresponding extremity of the last tracheal ring for some distance, opposite which part it is so narrow that the expanded hinder end of the second semiring does not manage to reach it, and remains separated by a small interval. This second semiring meets it in front, and sends inwards beyond the articulating spot a pointed process of some length. The lower bronchial rings are similarly poiuted and prolonged in front.

The bronchidesmus is powerful, at the same time that its posterior margin is the place of insertion of the pair of contiguous powerful muscles that runs down the back of the windpipe, and spreads laterally so much as to be just seen in the anterior view of the organ.

The windpipe of Oreortyx pictus differs in detail from that of the bird just described. The penultimate and last rings of the trachea blend in the mid-anterior and posterior line; whilst behind the antepenultimate does so also, articulating in front. The next four rings anteriorly are lozenge-shaped in the middle line, the six above which are uniformly thinned; but the intervals between them are much less considerable than in Lophortyx californicus. Posteriorly there are no interannular intervals at all. The bronchial semirings, the posterior muscles, and the bronchidesmus are as in Lophortyx.

In Arboricola atrogularis the bifurcating portion of the windpipe most closely resembles that of the American Quails. With no posterior interannular intervals, those in front are deep and twelve or so in number, being interrupted, in the case of that between the last and penultimate rings, by a large medio-anterior lozenge-shaped ossification which unites them, but continuous above except that a fine fibrous band runs up the tube, as in Lophortyx, previously described. The thinned antero-lateral element of the last ring has a slight special downward curve towards its inner end. In Oreortyx there is an indication of the same. The second bronchial semiring is prolonged inwards pointedly in front, and posteriorly does meet the first semiring to articulate slightly with it.

In Coturnix communis, with which C. coromandelica agrees in every respect, the posterior surface of the intrathoracic portion of the trachea is seen to be formed by rings between which no interannular intervals exist, except as transverse lines. Anteriorly, however, the rings are very much thinner, becoming so abruptly at the side of the tube, and the intervals between them are nearly twice their depth, even more than that towards the bifurcation of the tube. Narrow medio-anterior perpendicular isthmuses of fibrous tissue connect the lowermost six rings. Laterally the penultimate ring is slightly upturned, more behind than in front. The anterolateral thin portion of the circumference of the last ring is decidedly convex downwards, as is also the first bronchial semiring and the second. The last tracheal ring sends downwards a medio-anterior oblong process, ossified in the adult, to the lower angles of which
the first semirings articulate by their equally lengthy extensions inwards beyond the short articular processes for the second semirings. The posterior articulations of the incomplete last tracheal ring with the first semiring, and of that with the second on each side, are considerable, and much the same in detail as in Caccabis. The pessulus blends with the penultimate ring behind. The lateral intervals between the penultimate and last rings are plano-convex, the plane side being uppermost; those between the last ring and the first bronchial semirings are meniscoid, very deep, and concave upwards. Between the first and second semiring the interval is small, elongate, and curved like the one above it.

Fig. 9.


Front viem.

Fig. 10.


Back view.

## Coturnix communis.

Ptilopachys ventralis differs very little from Coturnix in this part of its windpipe.

Rollulus coronatus closely resembles the Oxtyxes and Quails. There are five fairly deep antero-lateral interannular intervals between the lowermost six tracheal rings, these same rings meeting in the middle line in front as well as through all the posterior moiety of the circumference. Ossification extends through the median fused anterior portions of the penultimate and last tracheal rings, as well
as a short distance posteriorly into the middle of the lower border of the penultimate ring, from the fair-sized bony pessulus. The last tracheal ring sends downwards a thick short process from its hinder end on either side, to articulate with the equally developed upturned posterior extremity of the first bronchial semiring, the anterior upward- and inward-directed terminal limb of which is proportionately long, at the same time that the angle it makes with the main element of the ring is very abrupt. The second semiring is nearly in contact superiorly with the first throughout its length. Anteriorly it ends in a point, as do the lower semirings, which extends a short distance into the inner membranous wall of the bronchus. Posteriorly it is slightly enlarged and rounded, ceasing a short distance outside the posterior angle of the semiring above, with which it is in contact.

Turning to the genus Euplocamus, in Euplocamus swinhoii the last four tracheal rings become slightly enlarged from above downwards. Between the simple antepenultimate ring and the one above it there is a slight interval, except in the middle line behind, where a general fusion of the last three rings occurs, as in all Euplocami. The penultimate ring sends downwards a narrow tongue-shaped median process anteriorly, which touches, but does not join, the upper margin of the there indented terminal tracheal ring. Its upper margin is also slightly irregular. The last ring is peculiar in front. Besides the shallow and broad concavity in the middle of its upper border, it sends downwards a deep and transversely considerable semiovoid process, notched at its apex, which is lowermost, to form the median element of the actual bifurcation of the tube. On either side of this notch, just beyond it, the anterior extremity of the first bronchial semiring articulates by its triangularly expanded end, the lower angle of which is jointed with the not much specialized second semiring, which posteriorly articulates by its somewhat expanded termination with the first semiring also. The hinder extremity of the first semiring fuses with the last tracheal, as does the posterior termination of the pessulus, to form a continuous cartilage along the back of the tube as high as the upper border of the antepenultimate tracheal ring. Antero-laterally the annular interval between the penultimate and last rings is well developed, and bent downwards near the middle line on account of the presence of the process and notch above described. The interval between the last tracheal ring and the first bronchial semiring is very large and deep on account of the great size of the descending process of the former. The interval between the first and second semirings is ovate and slightly deeper than those which follow. The pessulus is narrow.

Euplocamus pralatus, E. nychthemerus, and E. alhocristatus differ from $E$. swinhoii in that anteriorly the median process from the lower border of the penultimate ring blends with the upper border of the last tracheal, as does the upper border, but by a more slender isthmus, with the antepenultimate. In $E$. nychthemerus and $E$. albocristatus there is a further fusion of the anterior extremity of the
first semiring with the last tracheal at its (should be) articulating spot.

The pessulus is broad; and the angle on each side of its posterior blending with the penultimate ring runs a short way into the latter so as to reduce its depth a little at the spot. The interannular intervals are the same as in $E$. swinhoii, except the one between the antepenultimate and penultimate rings, which is interrupted in front by the narrow cartilaginous isthmus between them. Above this the following twelve rings or so touch all round; and they are succeeded by typically interlocking rings in the cervical portion of the tube. It must be also mentioned that whilst the plane of the penultimate tracheal ring is transrerse, that of each lateral moiety of the

Fig. 11.


Front view.

Fig. 12.


Back view.

Euplocamus albocristatus.
last one, as well as the first bronchial semiring, runs upwards from its more fixed median anterior and posterior parts. The plane of the second semiring makes an angle of some $15^{\circ}$ with the first.

In this last respect, as well as others, the genus Phasianus differs from Euplocamus. In Phasianus wallichii, P. colchicus, and P. versicolor the plane of each tracheal ring, as well as that of the uppermost bronchial semirings, is nearly, if not perfectly, transverse. The whole trachea narrows slightly at its lower end, to expand again opposite the last two or three rings. As in Euplocamus, the last three rings fuse in the middle line behind, as do the last two (in $\boldsymbol{P}$. wallichii the last three) in front, whilst in adult birds the anterior extremities of the first and second semirings participate in the blending, as does the pessulus posteriorly. In $P$. colchicus and $P$. versicolor (which differ from P. wallichii about as much as Euplocamus swinhoii does from its allies) there is a robustness about the
last two tracheal rings and the first two bronchial semirings peculiar to them. Their direct front view always exhibits the posterior articulation of the first bronchial semiring with the ring above and the semiring below, as in no other Gallinacenus bird with which. I am acquainted; thas, it includes the whole of the considerable interannular intervals between them, the upper ovoid, the lower semiovoid, with its convexity downwards. In Phasianus there is no interval between the penultimate and last tracheal rings, nor any of importance higher up. In P. colchicus, however, above the ante-

Fig. 13.


Front view.

Fig. 14.


Back view.

Phasianus colchicus.
penultimate ring, there are small median intervals, fusiform and elongate in front, minute behind. These shortly become the notches of the interlocking superior rings.

Pucrasia darwini is so like the genus Phasianus, as far as the parts under consideration are concerned, that it needs no separate description. Any difference is in the direction of Euplocamus, the sides of the last tracheal ring being slightly uptilted.

Retarning to Euplocamus, a start in another direction brings us to Thaumalea, T. picta and T. amherstice being identical, as far as their windpipes are concerned. In this genus the intrathoracic rings (tracheal rings) are in contact all round, as far as and including the penultimate ring, which sends down a short median anterior process to articulate with a small corresponding upward-directed one from the upper margin of the last ring. Posteriorly, in the young bird, the blunted triangular extremity of the pessulus interpolates itself between the two slightly expanded ends of this (therefore imperfect) ring, its extremity meeting and even disrupting
the continuity of the lower edge of the antepenultimate ring to a small extent. The last tracheal ring is characterized by the great obliquity of the plane of each of its lateral moieties, the downturned angle between which is less than $45^{\circ}$. Behind there is a considerable interval between its downward-directed ends, filled up by the pessulus, which is prevented from touching them by the intrusion of the extremities of the similar parts of the, also incomplete, penultimate ring. In front the middle of the ring is expanded into a large, quadrilateral, square-set cartilage, ossified in the adult, from the superior angles of which the slender oblique side elements of the ring take origin, to the inferior angles of which the first bronchial semiring is articulated in the chick and consolidated in the adult;

Fig. 15.


Front view.

Fig. 16.


Back view.

Thaumalea picta.
the middle of the superior margin of which also articulates or blends with (according to the age) the broad median descending process of the peniltimate ring. The first and second bronchial semirings are much alike; both are slightly swollen at their extremities, especially the anterior; and their planes of direction are parallel, which is not the case in Euplocamus. The lateral intervals between the penultimate and last tracheal rings are like the section of a plano-concave lens with the concavity (formed as it is by the arch of the lateral moiety of the last ring) downwards. The interval between the last ring and the first bronchial semiring is considerable and broadly fusiform; that between the first and second semiring is narrow and lanceolate, or fusiform in the adult, where the two semirings consolidate at their extremities.

Lagopus scoticus is not far different from Thaumalea in certain respects. The lower intrathoracic rings of the trachea are but little modified above the antepenultimate, there being slight median fusiform anterior interannular intervals, whilst posteriorly the ununited rings are keyed together, as in the middle of the windpipe generally. The penultimate ring agrees with the same in Thaumalea, even to being incomplete behind, the free ends slightly receding from the ring above. The last ring anteriorly agrees with the same genus in detail, its lateral arched moieties being even more slender and delicate. Posteriorly, however, its ends develop into large fairly equilateral triangular expansions, continuous with the slender lateral arch at its supero-external angle, articulating with the posterior end of the first bronchial semiring at its inferior angle, whilst its supero-

Fig. 17.


Front view.

Fig. 18.


Back view.

Lagopus scoticus.
internal angle joins a similar development at the side of the pessulus, the hinder part of which expands into a sagittate cartilage, the blunted apex of which is directed upwards to meet the middle of the inferior margin of the antepenultimate ring of the trachea. The main bar of the pessulus is very slender; and all the structures under consideration are built up of a much more yielding cartilage (without ossifying tendencies) than in any non-tetraonine birds. The first and second bronchial semirings are parallel to one another in course throughout, and are more uptilted laterally than in Thaumalea. Pos-
teriorly they are not expanded and scarcely touch; anteriorly they expand a little and articulate freely. The interannular intervals in essential points are not different from the preceding genus. The bronchial semirings below the second are peculiarly lengthy; their extremities turn inwards toward one another, and so slightly intrude into the membranous inner wall of each bronchus. One or more of the semirings may be bifid at their anterior ends. The bronchidesmus is particularly powerful in the Tetraonidæ, including Lagopus, and, as it were, pulls the two tubes into nearer relationship than would otherwise appear to be their tendency.

Lagopus mutus agrees with L. scoticus in every respect.
Tetrao urogalles and T. tetrix conform to a type which has several important differences from Lagopus scoticus, although in common they have the yielding cartilaginous (and never ossified) rings throughout the organ under consideration, as well as the great development in length of the bronchial semirings beyond the second.

In the female of Tetrao tetrix the first feature that strikes the observer is the consolidation of all the intrathoracic tracheal rings along the mid-posterior surface into a vertical bar, rendered more than it would be otherwise conspicuous by the considerable thinning of the lateral third or more of each ring on each side, and the consequent formation of lateral interannular spaces slightly deeper than the rings enclosing them. In the adult bird no trace of the transverse lines of junction between the constituent transverse annular elements of this vertical posterior bar can be seen; in the young bird, however, they are conspicuous. Anteriorly the rings above the antepenultimate are separated by an interval which slightly reduces the lowest of them, and that only, towards the middle line. There is a median semifusion in front, of considerable breadth, between the antepenultimate and penultimate rings, below which a broad cordiform cartilage represents the fused mid-anterior elements of the penultimate and last rings, with which the anterior extremity of the first bronchial ring is blended, and the second articulates, in such a way as to form lateral extensions of its apex. The line constituting the actual angle between the contiguous sides of the bronchi --produced, as just indicated, by the apex of the cordiform cartilage, together with the inferior margins of the lateral expansions, composed of the anterior ends of the first and second bronchial semirings -is less concave downwards than in Lagopus (in fact almost straight), and much less so than in the other Gallinæ. It has, in Tetrao, a very slight descending protrusion in the actual centre-the apex of the cordiform cartilage. Posteriorly each free end of the last tracheal ring expands and sends downwards and outwards a small process for the articulation and fusion with the similarly enlarged extremity of the first bronchial semiring. Upwards it blends with the base of the vertical posterior cartilage, which is considerably broader opposite the lowermost three tracheal rings than higher up. Into the middle of its base the narrow pessulus is seen to run. There is a great similarity between the depth and shape of all the interannular intervals in the bifurcating portion of the tube, the compara-
tively great depth of the intervals between the lateral parts of the last tracheal and the first bronchial semiring, observed in Thaumalea for instance, not being seen. The first and second bronchial semirings themselves, agreeing as they do with those of Layopus in all respects, are of the same thickness as their neighbours both above and below-the result being simplicity of construction a little more apparent than real. Many of the bronchial semirings are bifid at their anterior extremities.

In the male of Tetrao tetrix the trachea is most extraordinary. At first sight the deeply situated intrathoracic part appears to have

Fig. 19.


Front view.
Tetrao tetrix, $\delta^{7}$.
no similarity with that of the female, there being developed, on each side, an immense irregular tumefaction, communicating with its fellow by means of a bridge of fatty tissue which covers the anterior portions of the lowermost tracheal rings. When preserved in spirit this tumefaction shriuks to a comparatively small size, to swell to its original bulk upon immersion in water. This leads me to suppose that it is composed of "mucous" tissue, like that of the umbilical

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cord, which it resembles in consistence. The " mucous" tissue in this case is entirely developed between the external fibrous covering of the windpipe and the middle ring-carrying layer, the rings themselves not varying in the least, as far as I can detect, from their arrangement in the female.

Tetrao urogallus (a male, not quite full-sized, and without any trace of the cervical loop developed) differs from the female of $\dot{T}$. tetrix only in a few details. All the rings and semirings are thinner, and the interannular intervals greater. The posterior vertical bar is undistinguishable. Anteriorly, howerer, the lowermost seven tracheal rings are not thinned in the middle line, where they, above the penultimate, articulate above and below to form what becomes almost an anterior vertical bar as well. The corresponding parts of the

Fig. 20.


Front view.

Fig. 21.


Back view.

Tetrao urogallus.
penultimate and last rings, considerably narrower than in T. tetrix, expand and consolidate into an elongate lozenge, with a much shorter one above it, from the lateral angles of which the rings are continued, and from the inferior angle of the lower of which the articulating (and subsequently fusing) surfaces for the anterior ends of the first bronchial rings arise. The second semiring also articulates with the first, as in the allied birds, with, however, a considerably larger interannular interval than in T. tetrix. The lateral parts of the first semiring being markedly convex upwards, at the same time that the incurved last tracheal ring sends downwards rather lengthy processes from its posterior extremities as well as the deep lozenge-shaped cartilage in front, the interval between the two agrees with the section of a plano-concave lens. Some of the bronchial semirings are bifid at their extremities; and the bronchidesmus is very strong.

Tetrao cupido is intermediate in its tracheal bifurcation between $L a$ gopus scoticus together with L. mutus, on the one hand, and Tetrao
urogallus with T. tetrix on the other. Its cartilages are considerably less yielding than those of either genus; and the lower tracheal rings, instead of fusing behind to form a continuous longitudinal bar supporting the remaining parts of the rings upon each side, remain separate, in close contact, for the posterior half of their circumference. The pessulus interpolates its considerable cuneate posterior end as high as the antepenultimate ring, which it splits up. The lowermost nineteen tracheal rings are considerably thinned in front, the uppermost being least so. Of these, the antepenultimate ring, as well as the one above it, give indications of being bent downwards in the middle line in front. This angulation is more marked in the penultimate ring, and most so in the last ring, where a mid-anterior rhombic cartilage exists, of exactly the same shape as in Lagopus scoticus. The first and second bronchial semirings agree precisely with those of the last-named species, convexly upwards as they are curved; and, as in all the species of Lagopus and Tetrao, the bronchidesmus is strong, at the same time that the bronchial semirings almost completely encircle the tubes, learing a very narrow membranous unsupported wall. The bronchial tubes are comparatively lengthy.


In Perdix cinerea the intrathoracic portion of the trachea is quite different from the same in Caccabis or any of the birds above described. The last and penultimate tracheal rings are much developed, and blend to form the considerable three-way piece, which is triangular in front, apex downwards, and horizontally oblong behind. Of the anterior triangle, which is ossified, the two sides are formed by the last ring, whilst the penultimate ring constitutes the base, the intervening interval being filled up with a thin cartilage. The apex of the triangle is continued downwards in cartilage, this latter being deeply notched in the middle line, at the same time that the anterior extremities of the first and second slender and upward-arched bron-
chial semirings blend with it laterally. Laterally, the separation between the last and penultimate rings is feebly indicated, as it is posteriorly by the non-ossification of the latter, notwithstanding the blending of the two. Posteriorly the oblong ossified cartilage, with its unossified and slightly indented upper margin (the part formed by the penultimate ring), is joined by the slender pessulus in the middle of its lower edge, whilst it is with its lower extreme angles that the simple posterior extremities of the first bronchial balf-rings blend, the same parts of the second semirings not participating in the fusion, and being almost if not quite free, as are those below it at both ends. All the upper bronchial semirings are sleader, strongly convex upwards, and separated by intervals not greater than their depth. The interval between the last tracheal ring and the first semiring, to which it is united both in front and behind, is fairly deep and crescentic. The antepenultimate ring is very much slenderer than the one below it, from which it is separated by a large interannular interval, deeper in front than behind on account of the obliquity of its plane. Anteriorly it is very shallow and insignificant; and it gradually enlarges as it goes backwards. The ring above it is scarcely different, but slightly less oblique, the interannular interval between it and the fifth from the end being slightly less than that nest lower down. This fifth ring first gives indications of a latero-posterior deepening, with a corresponding reduction of the interannular interval and the formation of an antero-median horizontal fusiform space, the only remains of the interannular interval recognizable higher up, and extending into the cervical portion of the windpipe.

Ceriornis temmincki differs from all other Gallinæ examined by me, except Francolinus vulgaris, in that the third bronchial semiring articulates with the second, and so participates in the formation of the specialized organ under consideration. None of the tracheal rings are narrowed; and there are consequently no interannular intervals of any kind, if we except the one on each side of a narrow anterior isthmus which runs between the penultimate and the last ring. This interval is guttate in shape, on account of the slight upturning of the lateral element of the last ring, the antero-median part of which is expanded, almost exactly as in Euplocamus, into a quadrate cartilage. The pessulus at its posterior extremity is unattached, though situated as usual. Its freedom depends upon the fact that the penultimate as well as the last tracheal ring is incomplete behind, the end of the pessulus filling the deficiency and just touching the lower margin of the complete antepenultimate ring. This may possibly be the normal arrangement, all others resulting from subsequent consolidation. The first and second bronchial semirings are very much alike. The relations of the upper of them to the ring above, as well as those of the lower to the ring below, are almost identically those of Euplocamus; whilst posteriorly they consolidate together for one half their length, a small elongate fusiform interval existing external to their anterior fused extremities. With the lower of them the slightly-bowed third semiring articulates
at one end, and the other (as does the second in Euplocamus) with the first. Ceriornis satyra agrees exactly with C. temmincki in its lower larynx.

Fig. 24.


Front view.

Fig. 25.


Back view.
Ceriornis temmincki.
My acquaintance with the trachea of Francolinus is confined to F. vulyaris, an early sketch, too, only of that. Its great peculiarity is that the first three bronchial semirings articulate together, the third being decidedly the strongest, the first and second being separated by a greater interval than exists in Ceriornis.
In Crossoptilon mantchuricum the thoracic end of the trachea is euplocamine in construction. It narrows cousiderably near its termination, at which it again expands. The only indications of interannular intervals are small medio-anterior fusiform spaces, absent between the antepenultimate and penultimate rings, and replaced by a fusion in the case of the last two, on each side of which the lateral separation between the rings expands into a minute triangular interval, smaller than in Euplocamus. The pessulus agrees with that of the Euplocami. The interval between the last tracheal ring and the first bronchial semiring is very large, both upper and lower margin being about equally convex upwards, from the shape of the last tracheal ring and the uptilting of the first semiring. The interval between the first and second semirings is scarcely smaller, and is ovoid, the latter semiring being decidedly downturned laterally, bent upwards abruptly near its ends, and particularly strong throughout. On the whole, the organ is more like that of Phasianus than Euplocamus, its most striking difference from the former being the lateral uptilting of the first bronchial semiring, and the similar tendency in the sides of the last tracheal ring.

In Lophophorus impeyanus the lower tracheal rings, which are narrower than those above, are in contact with one another behiod;
but anteriorly they are thinner, leaving considerable intervals, diminishing as they ascend-continuous between the five rings above the penultimate, found also between it and the last, but in that case interrupted by a small median connecting isthmus, which is broader below than above, at the same time that it is continuous with the superiorly broader medio-anterior descending process of the last ring, the two together forming a lozenge-shaped cartilage that receives the extremities of the first semirings at its lower margin. Posteriorly the pessulus is continuous with the penultimate ring, whilst the ends of the last tracheal also blend with it slightly. The second bronchial semiring is slightly larger than the first, and articulates with it in the usual way, as does the first with the last tracheal ring. There is a great uniformity in the depths of all the interannular intervals in the region of the bifurcation of the trachea.

Fig. 26.


Front view.

Fig. 27.


Back view. Crossoptilon mantchuricum.

In Numida cristata, which may be taken as the type of the very characteristic windpipe of the genus, figured accurately as it is in part by Temminck ${ }^{1}$, the peculiarity is that the lowermost six or so tracheal rings develop antero-lateral fenestræ between them, increasing in size from above downwards, and produced by the thinning

[^14]of the rings alone. In the adult male the four lowest rings blend in the middle line, both anteriorly and posteriorly. Those higher up do not do so. The last ring of the trachea, the whole plane of which is transverse, sends downwards a bluntly triangular medioanterior process, with the lower margin of which the first bronchial semirings articulate. Posteriorly, in the full-grown bird, the pessulus fuses with the hinder extremities of the same, in such a way as to make it appear to form a continuation of it, as in no other of the Gallinæ with which I am acquainted. The first bronchial semiring sends upwards at right angles a strong anterior articular process, it posteriorly expanding triangularly, so that the upper angle meets the lower margin of the last tracheal ring in the usual

Fig. 28.


Front view.

Fig. 29.


Back view.

Numida cristata.
situation, the lower angle articulating with the second semiring, whose other end bends up to be jointed to the corresponding part of the first semiring, developed slightly downwards to articulate with it. The interval between the last tracheal ring and the first bronchial semiring is considerable and broadly quadrilateral ; that below it is much shallower; and those above are fusiform, diminishing gradually as they ascend, until the last is quite minute.
N. ptilorhyncha and N. rendalli are very similar. They agree with one another, and differ from $N$. cristata in that the extreme lateral edges of the penultimate and last tracheal rings meet and blend, thereby reducing the interannular interval to a guttate form,
with the apex directed outwards. In N. vulturina there are as many as ten pairs of lateral tracheal fenestræ.

In Meleagris gallopavo the intrathoracic rings are all thinned away in front, whilst posteriorly they are not so, the consequence being that considerable interannular intervals separate them anteriorly, entirely absent posteriorly. The antepenultimate and penultimate rings are alone joined by a median anterior isthmus of cartilage. The former of these is split across behind; the latter is not so, the fairly thick pessulus blending with the mid-posterior margin, its apex apparently producing a protrusion of its upper border between the sides of the fissure in the ring above. The penultimate ring is greater in diameter, and stronger than the rest. The last tracheal ring is represented only by the posterior extremities of the

Fig. 30.


Front view.

Fig. 31.


Back view.

Meleagris gallopavo.
normal ring, its lateral and anterior parts having quite disappeared, in the half-grown, and perhaps even younger bird. It will be remembered that its lateral elements are much reduced in Lagopus. In Meleagris the reduction has gone further, the only remainder being the inverted blunt triangular cartilage that intervenes between the juxta-pessular margin of the penultimate ring and the posterior articulation of the first bronchial semiring on each side of the organ. A minute pointed process of the outer margin of the cartilage under consideration indicates the situation of the posterior root of the
lateral portion of the atrophied ring. The first and second bronchial semirings are upturned laterally, and more slender than those below them. The first anteriorly sends upwards and inwards a lengthy process of about three times the thickness of the body of the ring itself, cut away obliquely, so that its upper end looks inwards and a little upwards, nearly to meet its fellow, from which it is separated by a narrow triangular fibro-cartilage, developed at its base from the middle of the antero-inferior margin of the penultimate ring of the trachea. The second semiring is slightly swollen at its ends to articulate with the semiring abore. The interval between the penultimate ring and the first semiring is necessarily considerable, and is quadrate as well as slightly biconcave ; that between the first and second semiring is meniscoid, convex upwards, and shallow. The bronchial semirings below the second are peculiarly lengthy, especially the fifth, and pointed at the ends. Strangely, also semiring three, a short distance esternal to its anterior termination, articulates by small special facets with those above and below. The bronchidesmus is particularly strong.

By Temminck ${ }^{1}$ this windpipe is imperfectly figured.
Gallus bankiva at first sight seems to have the lower end of its windpipe constructed upon quite a different type from that of any of its allies, although I have reason to believe that other species fill up the gaps between it and other Phasianidæ. The lower extremity of the trachea is very much compressed from side to side, whilst it is correspondingly augmented in depth from before backwards. The antero-posteriorly directed pessulus joins in front the base of a considerable median triangular cartilage, which, with upward-directed small-angled apex, reaches as high as the level of the antepenultimate tracheal ring ; posteriorly it joins a similar but smaller cartilage, the apex of which does not quite reach the penultimate ring. With the lateral angles of these triangular cartilages, the anterior and posterior extremities of the first bronchial semirings freely articulate. These semirings are large and much curved, with the convexity directed downwards. Anteriorly they meet, but do not articulate with the scarcely modified second semirings, from which they are quite independent behind.

The last tracheal ring is thin and band-like, joining the lower ends of the sides of the anterior triangular cartilage in front, whilst behind its free extremities are separated by a considerable interval, partly occupied by the posterior triangle. The penultimate ring persists as two straight lateral band-like rudiments fixed in the tracheal membrane, and nearly reaching both the anterior and posterior triangular cartilages. The antepenultimate ring is still further modified in the same direction, only the antero-lateral parts persisting as rudiments, not seen, therefore, in the back view of the organ. A short distance above the level of the apex of the anterior triangular cartilage, and some way below the first fairly normal tracheal ring, is a continuous filamentous transverse cartilage, with little extra pieces connected to it-incomplete in the middle line ${ }^{1}$ Loc. cit. pl. iii. fig. 8.
behind, supported by the membranous walls of the windpipe. This is evidently the atrophied fourth ring, counting from below. Above this an abrupt change occurs; the rings attain their ordinary depth, with only linear intervals between them. The fifth ring, again counting upwards, differs from those above it in being slightly incomplete behind, with downturned ends. The interval between it and the fourth is about equal to its own depth. It in front, and its

Fig. 32.

superior two or three neighbours behind as well, is slightly V-shaped in the middle line ${ }^{1}$.

The Cracidæ are particularly uniform in the manner in which the trachea bifurcates. In Mitua tuberosa there are no tracheal interannular intervals of any kind. The pessulus is united with the penultimate ring posteriorly and with the last ring in front, the latter ring being therefore incomplete behind, as in all the birds above described. Mid-anterior and posterior ossifications extend upwards from the attachments of the pessulus, generally sufficiently high to involve the four lowermost rings, which are therefore consolidated together in the median lines. The lower lateral borders of the last tracheal ring are slightly concave downwards; the medioanterior descending process being small, whilst by its slightly truncated triangular apex it forms a small portion of the actual margin of the bifurcation. On account of the considerable length of the
${ }^{1}$ By Temminck (loc. cit. pl. ii. fig. 4) a different figure of the windpipe of G. bankiva is given.
slender first bronchial semiring, which is very concave upwards, the interval between it and the last tracheal ring is conspicuously large and fusiform, one side of the small antero-median process and the outer border of the inferior angle of the corresponding truncated posterior termination of the last tracheal ring being its articulating spots. The semiring is not of uniform thickness, small expansions, not unlike the "tubercles" of ribs, occurring at a short distance from both ends, which mark the points at which the next semiring meets it and ceases. The second semiring is simple, except that it is slightly enlarged at its posterior extremity. The interval between it and its neighbours is extremely narrow.

Fig. 34.


Front view.

Fig. 35.


Back view.

Aburria carunculata.
The species I have examined are Crax globicera, C. carunculata, Pauxis galeata, Mitua tomentosa, Penelope jacucaca, P. cristata, P. superciliaris, Pipile cumanensis, and Aburria carunculata. In Penelope, Pipile, and Aburria the first bronchial semirings are thicker and stronger than in Crax and its near allies, their posterior articulations with the ends of the last tracheal ring being upon what becomes the outer, but normally would be the inferior surfaces of its juxtapessular terminations, because of a characteristic downward flexure of their expanded obtuse extremities.

The lateral intrinsic tracheal muscles are thin, and run down to cease opposite the ring fifth from the bifurcation of the tube, as in nearly all Gallinaceous birds. I cannot trace any fibrous continuation to the lower rings from their muscular extremities.

Incidentally it may be mentioned, with reference to the development of the extrathoracic tracheal loop in the Cracidæ, that, as far
as my facts go, this loop is found in the males only of the genera Crax, Pauxis, and Mitua; whilst in Penelope purpurascens, P.cristata, Pipile, and Aburria it is wanting in both sexes, it being present in both sexes of Penelope jacucaca. In the males of Penelope pileata and Ortalida albiventris ${ }^{1}$ it is present; the females I have not seen.

The flattening of the trachea of the male Cracinæ, excellently depicted (inverted) in Temminck's figure of the windpipe of Crax alector $^{2}$, is lateral or from side to side, so that the well-known anterior and posterior notching of the rings of the trachea is on the thin edges of the flattened tube.

In conclusion, it may be asked what light this detail concerning the bifurcation of the trachea throws on the mutual affinities of the genera of the Gallinæ. It is very infrequently that the study of a single organ justifies the formation of an ultimate classification of any group; and the windpipe of the Gallinæ is not peculiar in this respect. Several hints are to be derived from this investigation, however, not unimportant in my estimation.

Pavo seems to stand alone on account of the simplicity of its bronchial bifurcation.

There seems also to be a tendency for the majority of the Gallinæ to fall into two divisions, a Coturnicine and a Phasianine; in the former of which it is the bronchial semirings which are most specialized, at the same time that their anterior extremities are pointed and produced inwards. In the latter group it is the last tracheal ring that is most modified, its sides being always upturned. Upon this assumption it is not easy to place the genera Gallus, Lophophorus, Meleagris, and Numida. The others fall into the following order:-

| Coturnicine. | Phasianine. |
| :--- | :--- |
| Caccabis. | Euplocamus. |
| Argus. | Pucrasia. |
| Polyplectron. | Cerioris. |
| Ithaginis. | Phasianus. |
| Lophortyx. | Thaunalea. |
| Oreortyx. | Crossoptilon. |
| Aroricola. | Lagopus. |
| Rollulus. | Tetrau. |
| Ptilopachys. | (Meleayris?. |
| Coturnix. | Perdix. |

It is surprising to see how much the lower end of the trachea of the adult Gallus differs from that of Phasianus and its allies. A study of the development of the windpipe of the Common Fowlwhich I have not had the opportunity of undertaking-would probably throw considerable light upon the subject.

[^15]
# 4. On a new Fish of the Genus Lycodes from the Pacific. By Robert Collett, C.M.Z.S. 

[Received March 25, 1879.]

## Lycodes pacificus, n. sp.

Vomerine and palatine teeth none. Coloration uniform yellowish grey. The body is scaly, the head and the pectorals naked. The head is contained four times and six tenths, the height of the body nine times, in the total length. Lateral line very indistinct.

$$
\text { M.B.6. D. (circa) } 92 . \quad \text { A. 71. C. (circa) l.1. P. } 18 .
$$

Hab. Japan (Mus. Berol.).
Body moderately elongated; the height of the body is one half of the length of the head, which is contained four times and six tenths in the total length. The snout is only a trifle longer than the eye, which is one fourth of the length of the head; the upper maxillary

Lycodes paceficus (nat. size).
extending to below the anterior part of the eye. Teeth only in the jaws, forming a single row behind; in the upper jaw there is a double series in front, in the lower jaw three or four series. The origin of the dorsal is only a little behind the vertical from the root of the pectorals; it has about 92 rays, which are divided to their bases. The anal has 71 rays, and commences below the vertical from the seventeenth ray of the dorsal. The rays of the caudal are exceedingly close together and slender ; their number seems to be 6 on the dorsal, and 5 on the ventral side, as in other species of Lycodes. The pectorals are broad and rounded, and have 18 rays; their tips do not reach forwards to the eye. Along the jaw is slightly visible the usual row of shallow impressions, which correspond with the holes in the maxillary bones, as in the Lycoda generally. The body and the bases of the dorsal and the anal are scaly; the head, the pectorals, and the ventrals are naked. The distance of the vent from the snout is contained twice and a half in the total length. One
lateral line is visible, but very indistinct; it runs in the median furrow of the body.

The coloration (in the single preserved specimen) is a uniform yellowish grey, without trace of spots or bands. The belly is silky grey, the inside of the mouth black.
Measurements:- ..... millim.
Total length (to the tip of the caudal) ..... 184
Length from the snout to the origin of the dorsal ..... 43
Length from the snout to the vent ..... 73
Length from the vent to the tip of the caudal ..... 111
Length of the head ..... 40
Height of the body ..... 20
Length of the intermaxillary ..... 15
Length of the snout ..... 11
Length of the eye ..... 10
Length of the postorbital part of the head ..... 19
Length of the pectorals ..... 20
Through the kindness of Prof. Peters I have been enabled to describe a specimen of this species, $7 \frac{1}{2}$ inches long, which is preserved in the Zoological Museum of Berlin. It was purchased through Mr. Salvin, and was said to have been received from Japan. The absence of vomerine and palatine teeth, a character quite peculiar to the species, will perhaps necessitate its removal to a separate genus, for which I propose the name Lycodopsis.

Christiania, March 20, 1879.

## 5. On the Common Dolphin, Delphinus delphis, Linn. By William Henry Flomer, F.R.S., P.Z.S.

It is somewhat remarkable that no really adequate figure of so well known an animal as the Common Dolphin, Delphinus delphis, L., is to be found in any zoological publication. The best with which I am acquainted is one given by Reinhardt ("Notits om en paa östkysten of Jylland fanget Delphinus delphis," in Naturh. Forenings Vidensk. Meddelelser, Nr. $10 \& 11,1866$ ), from an animal 5 feet 4 inches long taken near Grenaa, on the Jutland shore of the Cattegat, in November 1865. This figure, however, is not coloured, and wants the details of the markings seen in the specimen to be described presently. Perhaps the next best figure, and, indeed, in some respects superior, is that given in the illustrated edition of Cuvier's 'Animal Kingdom,' which is stated to be "d'après une peinture originale de Maréchal faisant partie des vélins du Muséum." The figures in the volume on Cetacea in the 'Naturalist's Library' by Dr. Hamilton and in Bell's ‘ British Quadrupeds' are apparently founded on this, though in the latter the tail is differently formed, the gradations of colour are badly given in the engraving, and the whole creature has too
thick and clumsy an appearance. Bonnaterre's figure (Cétologie, 1789), professes to be origial, from an animal nine feet in length, in which case it could not have been $D$. delphis. It is reproduced by Lacépède (Hist. Na ${ }^{2}$. des Cétacés, 1804), with the addition of the conventional fountain from the blowhole. The earlier figures, all more or less inexact in outline, rude in execution, and of course deficient in colour, are those of Belon (1551), Rondelet (1554), and Aldrovandus (1613). The two former, especially that of Rondelet, have been repeated, with modifications, by the various compilers of the last two centuries.

On the 13th of March, Mr. F. Buckland kindly informed me that he had just received from Mr. Matthias Dunn, of Mevagissey, a Dolphin which had been caught in the mackerel-nets, about 20 miles south of the Deadman Headland, Cornwall. It proved to be a young female Delphinus delphis. The elegance of the form, and beauty and variety of the colouring was such, that I thought it desirable to obtain a correct coloured drawing of the animal while fresh, a copy of which I propose to publish in the Society's 'Transactions.' Instead of being simply black above and white below as usually described, the sides were shaded, mottled and streaked with various tints of yellow and grey, the distribution of which can be better understood by a reference to the figure than by any description. The colouring on the two sides was exactly alike. The under surface was of the purest possible white. The length of the creature in a straight line from the tip of beak to the notch in the middle of the tail was 5 feet $1 \frac{1}{2}$ inch. The other principal dimensions were as follows :-

## inches.

$$
\text { Tip of beak to anterior end of dorsal fin. ........ ...... } 31.5
$$

Tip of beak to insertion of anterior edge of pectoral fin.. $16 \cdot 1$
Tip of beak to angle of mouth. . . . . . . . . . . . . . . . . . . . $9 \cdot 0$
Angle of mouth to anterior angle of eye................. $1 \cdot 9$
Length of eye-aperture. .................................. $0 \cdot 8$
Posterior angle of eye to external auditory meatus...... 1.5
Length of base of dorsal fin. . ............................ 8.7
Height of dorsal fin .. ................................... . . $5 \cdot 5$
Length of anterior margin of pectoral fin ............. $10 \cdot 0$
Length of posterior margin of pectoral fin ............. 6.9
Breadth of caudal fin ................................. . . $13 \cdot 8$
The dental formula was $\frac{46-44}{48-47}=185$, which corresponds nearly with that usually observed in the species, some individual variation always met with, even on the different sides of the mouth. There are fifteen pairs of ribs, the last being unattached to its corresponding vertebra, and 21 lumbar and 31 caudal vertebre.

This species is the Dolphin par excellence of the Mediterranean; but its exact geographical range has never yet been defined with precision, owing to the difficulty of distinguishing it from allied speciesa difficulty which, it is hoped, the present drawing, when issued, may in some measure help to remore. It is not uncommon in the Atlantic,
on the west coast of France ; and it frequently visits the English Channel, pursuing the shoals of mackerel and pilchards. In the Museum of the College of Surgeons is the skeleton of a fine adult animal, which when alive must have been about seven feet long, taken near the beginning of the present century at Worthing. Northwards of this locality it appears to become rare. Van Beneden does not include it among the Cetacea frequenting the Belgian coast, as he was not able to find any example of its capture in the North Sea. Specimens, however, are occasionally met with on the coast of Norway and Deumark, as mentioned by Lilljeborg and Reinhardt; and although it is included in many of the lists of the Cetacea of the Greenland Seas, it is doubtful whether some of the species of Lagenorhynchus may not have been mistaken for it.

Mr. Buckland has added a cast of this specimen to his valuable series of models of Cetacea, which exhibit better than any other method yet devised the form, proportions, and colour of these animals, otherwise so difficult of preservation.

May 6, 1879.
Prof. Flower, F.R.S., President, in the Chair.
The Secretary read the following report on the additions to the Society's Menagerie during the month of April 1879:-

The total number of registered additions to the Society's Menagerie during the month of April 1879 was 110, of which 3 were by birth, 77 by presentation, 3 by purchase, 8 by exchange, and 19 were received on deposit. The total number of departures during the same period by death and removals was 115 .

The most noticeable additions during the month of April were as follows:-

1. Two Lanceolated Jays (Garrulus lanceolatus, Vigors) from the Himalayas, received in exchange April 1st. This fine bird, a close ally of our well-known Jay, has not, so far as I am aware, been brought to Europe alive previously.
2. Two female Roe-deer (said to have been brought from China, and purchased by one of the Society's correspondents at Marseilles), received in exchange April 3rd. These Deer are probably referable to the Capreolus pygargus (Pallas), and differ from the Europeau species in having a longer body and head, and being higher on the legs. The colour is much darker, and appears to be red in the summer coat. The ears are longer and more pointed.
3. A fine young male of the Japanese Goat-Antelope (Capricornus crispus ${ }^{1}$ ) presented by the Society's Corresponding Member, Mr. H. Pryer, of Yokohama, Japan, and received April 12th.

We owe Mr. Pryer many thanks for the trouble he has taken in obtaining for us this fine and rare auimal, the first of its species which has ever reached us.
4. An Alpine Accentor (Accentor alpinus) received in exchange April 30th, being, it is believed, the first example of this little bird obtained in captivity.

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According to present arrangements the 'Proceedings' are issued in four parts, as follows:-

| Part | I. containing papers read in January and February, on June lst. |  |  |
| :---: | :---: | :---: | :---: | :---: |
| II. | $"$ | $\because$ | $"$ March and April, on August 1 st. |
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## PR0CEEDINGS

 OF THESCIENTIFIC MEETINGS

OF THE

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 0F LOND0N,FOR THE YEAR

## 1879.

PART III.
containing papers read in MAY and JUNE.

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I have also to report that our Superintendent has had the four Indian Elephants carefully weighed, and that their sizes and weights are as follows:-


I propose to record these weights and dimensions in the Society's ' Proceedings' for future reference.

The following letter, addressed to the Secretary by Mr. E. L. Layard, F.Z.S., dated from Noumea, 29th January, 1879, was read:-
"Sir,-While giving my friend Mr. D. G. Elliot all the credit due to him for the vast amount of research and labour bestowed on his elaborate paper on the genus 'Ptilopus' (P. Z. S. 1878, p. 500), which has just reached me, and thanking him for the kindly and honorable way in which he has referred to my poor labours in the field of ornithology, permit me to protest as loudly as I can against my name being given as guarantee for very false information.
"As you, Sir, well know, my wandering life has cut me off from well-filled museums, specimens, and books. I therefore do not presume to offer an opinion on the classification or identification of any species. But I do profess, as a collecting naturalist, to describe correctly the habits and geographical distribution of the species which I meet with.
"Now Mr. Elliot gives my authority, amongst others, for ' Tongatabou' and 'Fiji' as being the habitats of Ptilopus purpuratus, and for the 'Navigators' and Friendly' Islands as being the habitats of his Pt, pictiventris. Surely Mr. Elliot has strangely orerlooked what I wrote, P. Z. S. 1876, pp. 495 \& 502 ; also P. Z. S. 1877, p. 464 !!
"I know not who procured the specimens examined by Mr. Elliot, and whether their habitats are to be trusted; but this I affirm, that of these green Ptilopi with magenta-coloured heads I never procured but one species on each group of islands, and I doubt if any one else ever did ; I will undertake to pick out the Fijian, the Tongan, and the Samoan birds among a thousand. I suppose Mr. Elliot unites the Tongan and Fijian races as one; I am conviuced they are distinct. I have sent, either to you or to the 'Ibis,' a paper on this subject, pointing out the distinctions. Where the paper has got to I don't know; it has apparently shared the fate of some others and been lost sight of; but surely what I have written (l.s. c.) might have prevented Mr. Eiliot from giving me as a guarantee for the propagagation of what I consider an error."

Prof. Flower exhibited a coloured drawing of Delphinus tursio, Fabr., taken from a nearly full-grown male animal which had been caught at Holyhead on the 5 th of October, 1868. Its length was 9 feet 6 inches. The drawing, with a description of the animal, will appear in the 'Transactions' of the Society.

A communication was read from Mr. Gerard Kreff, C.M.Z.S., containing a description and figure of a Bat, of which a specimen had lately been obtained in Quecusland, and which Mr. Krefft was inclined to refer to a new genus and species of the family Phyllostornatidæ. It was pointed out by Mr. Alston that the Bat in question was probably more correctly referable to the genus Megaderma, but was of great interest, as no species of that genus had yet been recorded as found in Australia.

The following papers were read:-

1. Description of a new Species of Woodpecker from the Island of Tzus Sima, near Japan. By Rev. H. B. Tristram, F.R.S.
[Received Maxch 20, 1879.]
(Plate XXXI.)
I have lately had placed in my hands for examination, through the kindness of Vice-Admiral Sir Geo. Henry Richards, K.C.B., F.R.S., a small but very interesting collection of birds, made by his sorn, Lieut. Richards, R.N., in the Japanese seas, anong which are some half-dozen species from the island of Tzus Sima, very seldom visited, and situated midway between Japan and the Corea. All belong to well-known Japanese forms, excepting one, which appears to me to be undescribed, and which I venture to name in honour of its discoverer

Dryocopus richardsi, sp. nov. (Plate XXXI.)
Dr. niger, pene resplendens; imo pectore, abdominis lateribus tergoque albis, crisso nigro, yula cinereo-nigra; remigibus sew prioribus ad apices albis; subalaribus et pogonio interno rectricum et tectricum superiorum ad basin albis per duos digitos longitudinis, tectricibus caudc superioribus et inferioribus albo marginatis: long. tot. 19, ala $9 \cdot 6$, caud. 8 , rostr. a rictu $2 \cdot 5$, lat. ad basin $\cdot \frac{5}{5}$, tarsi $1 \cdot 25$, digit. med. cum ungue 1-3.
This species is very nearly allied to Thriponaw hodgsoni (Jerd.) and T. craufurdi, G. R. Gr., the former from Malabar, the latter from Pegu. But no species of this genus has yet been observed in the vast intermediate region, although Mr. Swinhoe procured Dryocopus martius at Pekin. I cannot find any record of any large Woodpecker being found in Japan, though we may feel certain that




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NEW ASIATIC LEPIDOPTERA.
-


NEW ASIATIC LEPIDOPTERA.

this species, occurring so near as Tzus Sima, must also inhabit at least the southern island. Our new species is larger than any of its congeners. The female, which unfortunately alone we possess, is rather larger than the male of Thriponaw hodgsoni of Southerm India, from which species it may at once be distinguished by the extent of white on the back and breast being nearly double in extent, by the white tips to the quill-feathers, the white axillaries and under wing-coverts, and the white on the inner webs of the primaries and quill-feathers. From T. crawfurdi it is at once distinguished by its much larger size, exceeding that of the former by 4 inches in length, and the wing being $1 \frac{1}{2}$ inch longer, while the bill, which is $\frac{1}{2}$ inch longer, is much more massive, and the tarsus shorter.

Though the type is a female, there can be no doubt, from its correspondence with the females of the other species, that the male when obtained will be found to have the same sesual distinction of red on the head possessed by its congeners.

## 2. Descriptions of new Genera and Species of Asiatic Lepidoptera Heterocera. By F. Moore, F.Z.S. \&c.

[Received April 2, 1879.]
(Plates XXXII.-XXXIV.)

## Sphinges.

## Macroglossa taxicolor, n. sp.

Fore wing grey-brown, with two transverse median ferruginousbrown bands, the inner band narrowest at the costal end, the outer band angled on its external border and broadest at the costal end; a distinct black spot below the apex: hind wing pale ochreous-red, with dark ferruginous-brown base and outer band. Body ferrugi-nous-brown, with pale ochreous lateral spots; anal tuft black, slightly tipped with ferruginous. Underside ferruginous, with brown outer border and indistinct transverse narrow discal lines.

Expanse $1 \frac{3}{4}$ to 2 inches.
Hab. Ceylon. In coll. F. M. Mackwood and F. Morre.

> Clanis, Hübner.

Clanis, Hübn. Verz. bek. Schmett. p. 138.
Basiana, Walk. Catal. Lep. Het. B. M. viii. p. 236.

## Clanis undulosa, n. sp.

Male. Upperside cinnamon-brown. Fore wing washed with purple along posterior border; with seven transverse dusky brown lunular bands, the third bent inward to the costa and very broadly suffused across lower end of the cell; fourth and fifth composed of broader
lunules, which are confluent between the veins and interrupted between the upper median branch and the radial; the seventh with a dark trinugular grey-speckled patch at apical end ; an oblique fascia formed across the wing by the bent end of the fourth band and the outer parallel lunules: find wing densely black at the base, and black-speckled on the disk, with a distinct transverse narrow sinnous band; abdominal border pale ochreous. Abdomen paler cimnamon colour. Thorax and top of head with a longitudinal dusky streak; front of head black; shaft of antennæ pink. Legs pink ; tibiæ black at sides; hind tibiæ with a white streak above; spurs white. Underside paler-coloured, with three or four median transverse indistinct dusky sinuous bands: fore wing with a broad black streak from base below the cell, and a narrow oblique apical line.

Expanse $4 \frac{1}{4}$ inches.
Mab. N. China. In coll. Dr. Staudinger.
Nearest allied to C. bilineata (Basiana bilineata, Walk.), from N.E. Bengal, from which it differs above in being of an entirely different colour and markings.

## Ambulyx auripennis, n. sp.

Male. Upperside-fore wing golden-brown, palest at the base and greenish-tinted externally; a small pale-bordered dark sap-brown spot at the base, and a larger spot below the cell; a pale sap-brown narrow band recurving from apex to posterior angle; four equidistant short, oblique, indistinct costal streaks, and two less distinct transverse discal sinuous lines: hind wing dark ochreous, anterior border yellowish, crossed by three short blackish simuous fasciæ, the base of wing also blackish. Body ochreous-brown, pink-tinted; a frontal band, broad lateral band on thorax, and a narrow dorsal line sapbrown. Palpi, pectus, and anal segments beneath ferruginous. Underside yellowish ferruginous; disk brown-speckled; a grey marginal band on fore wing.

Expanse 3 inches.
Hab. Ceylon (Sir TV. H. Gregory). In coll. Dublin Museum.
Nearest allied to A. rhodoptera, Butler, from Darjiling.

## Triptogon rectilinea, n. sp.

Male. Nearest allied to T. fuscescens, Butler, Trans. Z. S. ix.p. 587, pl. 93 . f. 2, but of smaller size. Fore wing deeper-coloured, the transverse lines blacker, there being four in the subbasal series, which are erect and not curved outwards; the discal pair are both angled at the middle; and the outer pair are close together and parallel throughout their length : hind wing of a brighter chestnut colour, with a smaller greyish anal area, and with a continuous dark streak; middle of thorax and a posterior band dark chestnut.

Expanse 2 $2 \frac{6}{8}$ inches.
Hab. N. India. In coll, Dublin Museum.

Bombyces.<br>Fam. Agaristide.<br>Seudyra, Stretch, Cistula Entom. ii. p. 19 (1875).

Seudyra venosa, n. sp.
Upperside-fore wing with the apex and broad band on hind margin dark chestnut-brown, suffused with lilac and crossed by sinuous white lines ; intermediate space from the base greyish white speckled with black, the veins being prominently whitish; a transverse, subbasal, curved greyish line and a tortuous discal double line, enclosing a pale-bordered, oval, orbicular and large reniform spot, both the lines terminating near together on middle of hind margin: hind wing golden yellow, with a broad black marginal band, which is broken at anal angle. Cilia grey. Thorax chestnut-brown, greyspeckled; abdomen and legs golden yellow, with a short basal dorsal brown tuft.

Underside-fore wing with the basal third yellow, the outer portion black, and enclosing a small white quadrate spot before end of the cell, and a large, broad, oblique discal spot beyond: hind wing yellow, with broad outer black band and a terminal anal spot: a marginal row of white dentate marks on both wings.

Exp. $1 \frac{7}{8}$ to $2 \frac{2}{8}$ inches.
Hab. Darjiling (Russell). In coll. F. Moore.
Fam. Zygrnide.
Zygena asoka, u. sp.
Fore wing blackish green, with five orange-yellow spots, the first subbasal, the second and third costal, each at one third its length, the fourth below the cell, the fifth subapical and crossed by two black veins : hind wing jet-black, with two large crimson-red spaces, one being basal, the other apical and longitudinally black-streaked. Antennæ steel-blue. Head, thorax, and body jet-black. An orangeyellow spot on each side of front of thorax. Second and third anal segment crimson-red. Legs black.

Exp. 14 inch.
Hab. N.W. India. In coll. late C. Horne, Esq.

## Syntomis austeni, n. sp.

Yellowish hyaline. Veins prominently black: fore wing with narrow black marginal band, streak along lower median veinlet, and band between upper median and lower subcostal veinlets: hind wing with marginal black band dentated below lower median veinlet; anal margin yellow. Body jet-black, middle and sides of thorax and broad band on each segment of abdomen orange-red, tip being black. Legs brownish black.

Exp. $1 \frac{3}{5}$ inch.
Hab. Surarium, N.E. Bengal (Godwin-Austen). In coll. F. Moore.

Dysauxes indica, n. sp.
Female. Upperside chocolate-brown : fore wing with two yellow median spots, the upper round, lower conical and on hind margin : hind wing with the basal half yellow. Front of head, tegulæ, and tip of abdomen yellow. Spots on underside of fore wing less defined. Legs brown.

Exp. $1 \frac{1}{5}$ inch.
Hab. Bombay (Dr. Leith). In coll. F. Moore.
Larger than D. punctata of Europe, and distinguished by having only two yellow spots on fore wing.

Artona quadrimaculata, n. sp.
Male and Female. Brown; cilia whitish: fore wing with a small oval subapical yellow spot: hind wing with a short, curved, clavate, median, transrerse yellow streak. Palpi and legs greyish brown.

Exp. $\frac{7}{12}$ inch.
Hab. Masuri, N.W. Himalayas. In coll. Major Lang and F. Moore.

Fam. Chalcositid.

Arachotia ${ }^{1}$, Moore, Asiat. Soc. Beng., Desc. Lep. Atk. Coll. p. 14 (1878).

Arachotia vespoides, n. sp.
Female. Wings transparent, yellowish : fore wing with the costa and hind margin, subcostal and median veins, a discocellular streak, and outer marginal band black: hind wing with the costal margin white; narrow outer marginal band black; outer marginal band on both wings dentāted near posterior angle. Antenne black. Tertex and thorax black ; collar and band across thorax yellow. Front of head grey. Abdomen yellow above, greyish beneath, with black narrow bands and broad tip. Palpi yellow, black-tipped. Legs black, streaked with grey beneath.

Exp. $1 \frac{5}{8}$ inch.
Hab. N. India. In coll. F. Moore:
Chalcosia albata, n. sp.
Similar to C. idroides, H.-S. Lep. Spec. Nov. pl. 1. f. 6, from Jara. Differs in having the oblique bands and hind wing pure white above and beneath, the discal band on fore wing being broader and of uniform width throughout, and the marginal black band on hind wing narrower. Collar above with two metallic-blue raised spots; palpi and legs white.

Expanse 2 to $2 \frac{5}{8}$ inches.
Hab. Dharmsala, N.W. Himalaya; Nepal. In coll. F. Moore.
Chalcosta bicolor, n. sp.
Female. Upperside pale greenish yellow: fore wing with a broad, even-margined, dark cupreous-brown submarginal band: hind wing This genus is allied to Trypanophora.
with an inner-angled black apical band. Base of costal border, upper part of thorax, head, and antennæ steel-blue; front of head and palpi white. Legs yellowish, slightly steel-blue above. Underside as above; band on fore wing with a geminated white spot below the apex, the apex of both bands steel-bluc.

Expanse $1 \frac{6}{12}$ inch.
Hub. Sumatra (Buxton) ; Malacca (Eichhorn). In coll. F. Moore and Dr. Staudinger.

## Chelura basiflava, n . sp.

Male. Upperside pale livid white: fore wing with a short basal costal ochreous streak, three basal transverse dark fuliginous bands, the outer portion of the wing being paler fuliginous, leaving only a short, pale livid-white streak between the veins: hind wing with the subcostal and median branches bordered with fuliginous, leaving only a pale livid white elongated streak between the veins. Head, antemne, hind part of thorax, and abdomen fuliginous black; collar and fore part of thorax and tip of abdomen ochreous. Legs fuliginous black.

Expanse 2 $\frac{3}{8}$ inches.
Hab. Darjeeling. In coll. F. Moore.
Smaller than C. bifasciata, Hope. Differs in the absence of the two ochreous transverse subbasal bands, these being entirely black, instead of ochreous with black borders, and in the veins being very much more broadly bordered with fuliginous.

Agalope livida, n. sp.
Female. Upperside dull opaque bluish white; veins dark brown : fore wing with a basal orange-yellow patch; area within the base of the cell in fore wing and apex of both wings fuliginous. Body, antennæ, and legs black ; fore legs above greyish.

Expanse $2 \frac{1}{8}$ inches.
Hab. China. In coll. Dr. Standinger.
Differs from A. basalis, Walker, from the N.W. Himalayas, on the fore wing in the absence of the median transverse fuliginous band, and in the hind wing having the veins dark and the apex fuliginous.

## Boradia, n. g.

Male and Female. Fore wing elongated oval ; costal vein extending to two thirds its length; subcostal vein three-branched, first branch arising before end of the cell, sccond from end of the cell, bifid; discocellulars bent inward at the middle, upper bent outward near subcostal end; radial from angle of upper discocellular, and a discoidal veinlet emitted within the cell ; median vein four-branched, the branches straight, two upper branches on a foot-stalk from end of the cell; a submedian and an internal vein: hind wing elongated, trigonal ; costal vein extending to apex ; subcostal vein two-branched, first branch very short, and joined to costal before end of the cell, second from end of the cell; discocellulars, radial, and discoidal veins as in fore wing ; median vein four-branched, the two upper
from end of cell, but separated at base ; a submedian and two internal veins. Body short ; antennæ bipectinate in male, slightly serrate in female; thorax slightly pilose; abdomen and legs nearly naked.

Allied to Agalope, Walker.
Boradia carneola, n. sp.
Male and Female subhyaline, pale flesh-colour, yellowish at base of fore wing. Abdomen black; thorax and head above yellowish; antennæ and legs black; tarsi tawny.

Expanse $1 \frac{1}{4}$ inch.
Hab. Dharmsala, N.W. Himalaya (Rev. II. Hocking). In coll. Lord Walsingham and F. Moore.

Cyclosia subflava, n. sp.
Mate. Upperside pale dull buff-y yllow : fore wing with the veins blue-lined basally, and broadly with black externally, their outer ends forming a narrow marginal band, the interspaces on the disk minutely black-speckled: hind wing with the veins at the extreme base and externally blue-lined, outer marginal band narrow, black apically, blue posteriorly. Thorax, head above, and antemæe steel-blue; abdomen green; front of head and palpi white, the latter blue at sides. Legs blue above, white beneath. Underside blacker-veined than above; basal area of hind wing bright yellow.

Expanse 2 inches.
Hab. Malacen (Eichhorn). In coll. Dr. Stnudinger.
Distinguished from $C \cdot p$ apilionaria by the absence of the marginal row of spots on both wings, and in the basal area of the hind wing being bright yellow beneath.

Canerkes semiplena.
Euschema semiplena, Walker, Catal. Lep. Het. B. M. p. 1 it (1864), 오.

Hab. Malacca. In coll. F. Moorc (ex coll. Norris).

> Ratarda, n. g.

Male and Female. Wings obovate. Fore wing short, costa slightly arched, apex and exterior margin very consex, posterior margin short; costal vein short; subcostal vein four-branched, first branch starting at half length of the cell, second trifurcate, the upper fork at half its length, second fork near apex ; cell short, oblique ; discocellulars very oblique, bent in the middle, each slightly curved; a discoidal veinlet emitted from angle of discocellulars, continuous with the radial and extending to base of the cell; radial from middle of the discocellulars; median vein four-branched, the two upper from angles at end of the cell; a submedian and an internal vein. Hind wing of the same length as fore wing, convex externally; costal vein short; cell broad, short, oblique ; upper discocellular short, lower very oblique; subcostal two-branched, first before end of cell; a
straight discoidal veinlet from middle angle of discocellulars to base of cell; median four-branched, two upper from angles at end of the cell; a submedian and two internal veins. Body short, sparsely pilose. Legs short, sparsely pilose. Legs short, slender, nearly naked. Palpi minute, pilose. Antenne bipectinated.

## Ratarda marmorata, 11. sp. (Plate XXXII. fig. 1.)

Male. Upperside-fore wing blackish fuliginous, with a white irregular space within the cell, large circular-shaped spots below it, and very indistinct speckled spots beyond: hind wing blackish fuliginous on external half, the base white ; outer half slightly whitespeckled. Underside similar to abore, the white on fore wing more diffused, and the hind wing more prominentiy white-speckled. Female blacker than male. Body blackish fuliginous. Legs yellowish.

Expanse of $1 \frac{6}{8}$, 오 $1 \frac{9}{10}$ inch.
Hab. Darjiling. In coll. F. Moore and British Museum.

> Klaboana, n. g.

Female. Fore wing elongated; costa slightly arched at base, apex somewhat pointed, exterior margin nearly straight ; first branch of subcostal vein short, oblique, and anastomosed to costal, second before end of the cell, free, third trifurcate, upper starting at nearly half length beyond the cell, the two lower on a foot-stalk near junction with upper; radial starting from below subcostal at beyond half distance between end of the cell and third branch; cell broad at its end ; discocellulars bent rery obliquely inward, upper shortest; a discoidal upper reinlet emitted within the cell from middle of discocellulars and extending to its end, a lower shorter discoidal veinlet from lower end of discocellulars and joining the upper one at one third its length ; median vein four-branched, two upper branches from point at lower end of the cell; a submedian and internal vein. Hind wing broad, apex and exterior margin convex, abdominal margin as long as the body; cell broad; subcostal vein angled upward at first branch and oblique beyond, first branch very short and anastomosed to costal, second from end of cell; discocellulars contiguous and bent inward, upper angled near subcostal; radial starting from angle of upper discocellular; median four-branched, each branch from nearly equidistant angles, upper curved and close to radial ; a submedian and two internal veins. Body slender; abdomen with an anal radiated tuft of short fine hairs. Antennre bipectinate. Palpi small. Legs long, squamous; middle and hind legs armed only with a very small terminal pair of spurs.

[^17]Thymara, Doubleday, Zoologist, i. p. 197.
Thymara caudata, n. sp. (Plate XXXII. fig. 3.)
Mate. Fore wing dark fuliginous, veins black ; the space within the cell and immediately below it to the base ochreous: Rind wing golden yellow, with a large median costal spot, a smaller subanal spot, and the entire elongated tail and its fringe black. Body golden yellow; thorax and anal tuft black. Front of head and legs golden yellow.

Expanse: fore wing $1 \frac{1}{8}$ inch; hind wing, including tail, $\frac{10}{10}$ inch.
Hab. British Burmah. In coll. F. Moore.
This species has also been taken at Punkabari, in Assam, by Mr. W. B. Farr, who has a fine specimen in his collection from that locality.

## Fam. Nyctemeride.

## Nyctemera nignovenosa, n. sp.

Allied to $N$. coleta, Cram. (Exot. Lep. pl. 368. f. H), from Java. Differs on the fore wing in the discal maculated band being somewhat narrower, and on the hind wing in the veins being lined with black throughout both above and beneath.

Expanse $1 \frac{3}{4}$ inch.
Hab. Ceylon. In coll. F. Moore.

## Fam. Lithosiide.

Cossa nubecula, m. sp.
Male. Pale greyish ochreous: fore wing with a black short trinngular streak on the costa beyond the middle; a brown-speckled indistinct patch from before the apex and along the exterior margin : hind wing with a very indistinct darker marginal fascia. Under-side-fore wing dusky brown. Legs dusky brown above.

Expanse $1 \frac{1}{12}$ inch.
Hab. Andamans (Port Blair). In coll. F. Moore.
Barsine pretiosa, n. sp.
Allied to B. gratiosa, Guér. Deless. Voy. pl. 26. f. 1, from S. India. Differs above in being greyish ochreous, the fore wing having five transverse series of red spots, which are smaller, the two outer series linear, but discomnected.

Expanse ${ }^{7} 1 \frac{3}{8}$ inch.
Hab. Dharmsala, N.W. Himalaya (Rev. II. Hocking). In coll. Lord Walsingham.

Setina dharma, n. sp.
Ochreous-yellow; fore wing with a small black basal spot, a transverse interrupted series of four spots, a spot at end of the cell, and a recurved discal series of spots, the latter slightly elongated. Thorax with two small black spots on anterior part; legs ahore black-streaked.

Expanse $\frac{6}{8}$ to 1 inch.
Hab. Dharmsala, N.W. Himalaya (Rev. H. Hockimy). In coll. Lord Walsingham.

## Fam. Arctidde.

Gonerda, m.g.
Male. Fore wing long, costa nearly straight, apex acute, exterior margin slightly oblique, hind margin straight to near end; costal vein extending two thirds its length; subcostal vein four-branched, first and second branches arising before end of the cell, fourth and fifth short, the fifth arising from below the third at half its length, fourth from below end of the third; discocellulars slightly oblique, upper very short ; one radial starting from angle at upper end of the cell; median vein four-branched, the three upper contiguous at lower end of the cell; submedian curved and extending near the hind margin. Hind wing broad, costal margin uearly straight, apex rather acute, outer margin convex; subcostal extending to near apex, threebranched; discocellulars oblique; median vein as in fore wing; submedian nearly straight. Body stout, densely pilose, hairs long and lax on the thorax, anal tuft prominent and divergent ; antenne bipectinated. Palpi decumbent, densely pilose, third joint long. Legs pilose beneath, spurred.

Near to genus Alope, Walker.
Gonerda perornata, n. sp. (Plate XXXII. fig. 2.)
Male. Fore wing yellow, crossed by four narrow black irregular bands and two series of basal streaks, the outer or marginal band extending slightly upward beyond posterior angle, the second band being short, third band recurved, fourth bent inward near end of the cell; a black oblique spot at end of the cell; the basal streaks short, irregular, and broken by the veins: hind wing deep crimson, crossed by three broad, irregular curved black bands and a narrow marginal line. Cilia of both wings yellow. Thorax ochreous-yellow, with three longitudinal black bands. Abdomen crimson, with black dorsal band and fringe to tuft. Underside as above, the markings on fore wing slightly confluent. Palpi, head, and body beneath black; femora above crimson. Antennæ brown, shaft yellowish.

Expanse 2 inches.
Hab. Cashmere. In coll. F. Moore.

## Arctia suttadra, n. sp.

Female. Upperside-fore wing with three oblique transverse brownish-black broad bands, the interspaces creamy white; first band basal, second median and bifid on the costa, third apical partly divided ; cilia black. Hind wing crimson, with two large, irregular, oval, submarginal black spots, also a very small spot below the cell; cilia alternate black and yellow. Palpi, head, thorax, and body black; abdomen only with lateral crimson bands. Underside with the median and apical bands as above, the basal absent, interspaces yellow: hind wing as above, but no spot below the cell; a narrow streak at end of cell. Abdominal riugs fringed with red; legs black, front and mid legs streaked with red, hind tarsi yellowish. Antennæ black.

Expanse $1 \frac{1}{4}$ inch.
IIab. Cashmere (Stakpila Pass), 12,000 feet. In coll. Capt. H. B. Hellard.

Pangora, Moore, Asiat. Soc. Beng., Desc. Lep. Atk. Coll. p. 42 (1878).

Pangora matherana, n. sp.
Male and Female. Upperside-fore wing olive-brown, with a cream-white broad irregular patch at base, a median transserse distorted band, and large upper and lower outer marginal spots, the basal patch with tro small lower black spots and a streak beneath them : hind wing ochrey-yellow, with a brown narrow transrerse median band, and a broad outer band enclosing upper and lower marginal yellow spots; the outer band broken in the male. Top of head and thorax white, black-spotted, and with a streak down middle of thoras. Abdomen ochrey-yellow, with dorsal and lateral row of black spots. Body beneath and legs brown ; femora abore yellow. Palpi yellow, tip black. Antemæ brown, basal joint yellow. Underside marked as above, the basal and median spaces on fore wing being also yellow. Near to P. crosa, Walk.

Expanse, of $^{2} 1 \frac{1}{8}$, ㅇ $2 \frac{2}{3}$ inches.
Hab. Matheran Hill, Bombay (Dr. Leith). In coll. F. Moore and British Museum.

Rajendra, Moore, Asiat. Soc. Beng., Desc. Lep. Atk. Coll. p. 43 (1878).

Form and neuration similar to Creatonotus, but differs in the hind wing being shorter, less produced at the apex, and the greater convexity of the hind margin. Palpi prominent; antennæ minutely bipectinate in male, simple in female.

Type R. lativitta, Moore, l. c. p. 43.
This genus will embrace Aloa sipahi and A. nigricans, Moore, and also several other small species of Tiger-moths described by Mr. Walker under Aloa, but which are not congeneric with the type of that genus, these being characterized chiefly by having a longitudinal pale band on the fore wing; they are A. integra, dentata, biguttata.

## Rajendra vittata, n. sp. (Plate XXXII. fig. I2.)

Mate. Fore wing brownish black, with a broad, longitudinal, curred, pinkish white band from base to apex : hind wing pale pink, with a blackish streak at base of anterior margin, a spot at end of the cell, another spot at anal angle, and two very indistinct grey-speckled submarginal spots. Cilia of both mings white. Middle of thorax black; tegulæ and sides of head pink-white, a black spot on each tegula. Abdomen bright red above, beneath and dorsal bands black. Antenne greyish. Firont of head and palpi black. Legs black, femora red. Underside of wings as abore.

Expanse $1 \frac{6}{8}$ inch.

Hab. British Burmah. In coll. F. Moore.
Differs from R. biguttata, Walker, in the cilia being white instead of black on both wings, and in the hind wing being very differently spotted.

## Rajendra pannosa, n. sp. (Plate XXXII. fig. 8.)

Male and Female. Upperside-fore wing dark olive-brown, with a broad ochrey-white, lower, longitudinal, irregular sinuous-bordered band from base to below the apex; below the band in some specimens are a fer rery small contiguous or partly confluent spots; a linear series of three small spots before the apex, and a contiguous costal dentate spot: hind wing ochrey-red, with two small brown costal spots, an indistinct spot at end of the cell, a larger spot (broken in the male) before the apex, and one or two small spots near anal angle. T'op of head, front and sides of thorax ochreywhite, slightly fringed with ochrey-red, black-spotted, the middle of thoras and a streak on side of tegula brown. Abdomen ochrey-red, with small dorsal and lateral black spots. Antennæ black, with broad white band near tip; basal joint ochrey-red. Palpi ochreyred, tip black. Front of head black. Body beneath ochrey-yellow; legs black, streaked below with ochrey-yellow; femora above red. Underside of wings as above.

Expanse, 0 ㄴ $1 \frac{4}{8}$, 아 $1 \frac{6}{8}$ inch.
IIab. Dharmsala (N.W. Himalaya). In coll. F. Moore.
Hypercompa flavicolor, n. sp.
Male and Female. Near to $H$. equitalis, Köllar, but of smaller size, the markings on fore wing and the colour of the hind wing ochrey-yellow. On the fore wing the upper spot at end of the cell is the longest, and has two contiguous spots at its upper end before the apex; the spots above the submedian vein are equidistant, and are entirely or partly formed into three, the outer spot being at a distance from the posterior angle; along the hind margin is a very narrow wavy yellow band; other spots similar to II. equitalis: hind wing with black narrow line on veins, a broad irregular spot at end of the cell, and four angle-bordered submarginal spots, the upper one on anterior margin before the apex, a narrow streak on middle of outer margin; cilia of hind wing yellow, except at the marginal streak, where it is black. Palpi black only on terminal joint; vertex without spots. Legs buffi-white, streaked and banded with brown. Abdomen with a dorsal row of small black spots.

Expanse $2 \frac{2}{8}$ to $2 \frac{4}{8}$ inches.
Hab. Simla, N.W. Himalaya. In coll. F. Moore,

## Hypercompa similis, n. sp.

Form and pattern of II. equitalis. Fore wing darker green ; spots of a clear ochrey-yellow; costal spots small ; the series beyond end of the cell composed of six in a curve, the lowest spot small and placed below the cell, seren spots in the series between the lower median and submedian veins; the outer marginal series small:
hind wing yellowish white, veins and two median transverse parti-ally-interrupted bands, and cilia fuliginous. Legs blackish above, ochraceous beneath.

Expanse 2 inches.
Hab. Dharmsala, N.W. Himalaya. In coll. F. Moore.

## Rhyparia tigrina, n. sp. (Plate XXXII. fig. 4.)

Mrale. Upperside yellowish ochraceous: fore wing with broad black streak along basal end of each vein, and two transverse confluent series of outer spots: hind wing with black costal border, a suffused spot at end of the cell, and a broad, irregular-bordered submarginal band. A black central spot on thorax, dorsal bands and lateral spots on abdomen. Underside as above. Antennæ, side of head, and palpi black. Legs black, femora ochreous.

Expanse $1 \frac{4}{8}$ inch.
Mab. Pulney Hills, S. India (Sealy). In coll. India Museum and F. Moore.

Somewhat allied to R. strigatula (Aretia strigatula, Walker), from Java, but of different colour and markings.

## Cycnia transversa, n. sp.

Upperside pale purplish testaceous: fore wing crossed by six black equidistant, irregular, interrupted bands and a marginal row of spots, the bands bent inward and broadest at the costal end: hind wing with a black spot at end of the cell, and an interrupted submarginal serics. Underside paler; marked as above. Body black-spotted.

Expanse $1 \frac{1}{4}$ inch.
ILab. N.W. India. In coll. F. Moore.

## Challa, n. g.

Male and Female. Fore wing elongate, narrow, costa slightly arched towards end, apex nearly convex, exterior margin oblique; subcostal vein five-branched, first branch starting inmediately before end of the cell; second from end of cell, quadrifid, the three upper forks short, lowest from below junction of first fork; radial from upper end of the cell ; discocellulars of equal length, bent inward ; a very slender discoidal veinlet emitted within the cell; median vein four-branched, two upper branches joined together at their base, and starting from end of the cell, third contiguous; submedian vein near the posterior margin. Hind wing obovate, subcostal touching the costal at its base, two-branched from end of the cell; upper discocellular shortest, lower very obliquely outward; a discoidal veinlet emitted within the cell; median four-branched, the three upper starting from end of the cell; a submedian and two interior veins. Body short, laxly pilose; antennæ bipectinate in male, minutely serrate-pectinate in female ; palpi short, minute; femora and tibiæ slightly pilose.

Allied to Alpenus, Walker.

[^18]abdomen; fore wing with a small black spot at upper end of the cell ; fore legs above lined with black, middle tibix at their end and middle and hind tarsi black-streaked; abdomen with an indistinct series of small black dorsal and lateral spots ; palpi black, streaked above ; pectinations of antenne blackish.

Expanse, of 1 , 오 $1 \frac{1}{4}$ inch.
Hab. Dharmsala, N.W. Himalaya (Rev. II. IIocking). In coll. Lord Walsingham and F. Moore.

Challa discalis, n. sp. (Plate XXXII. fig. 7.)
Male. Pale ochreous-yellow ; thorax and abdomen brighter ochreous: fore wing with a short, indistinct, blackish maculated discal band crossing from upper end of the cell, and thence obliquely to above middle of posterior margin; a similar-coloured spot within middle of the cell, one below it, and another at base of the costa: hind wing with an indistinct similar-coloured spot at upper end of the cell, crossed by the discocellular vein. Abdomen with a dorsal and lateral row of very small black spots. Palpi, fore legs, and tarsi above black-streaked; pectinations of antennæ blackish.

Expanse $1 \frac{1}{12}$ inch.
Hab. N.W. Himalaya. In coll. F. Moore.

## Fam. Liparide.

Aroa ochripicta, n. sp.
Male. Bright ochreous-red; fore wing slightly brownish along the costal border and below the cell.

Female. Pale greyish ochreous-brown, greyest on fore wing.
Expanse, of $\frac{1}{10}$, 오 $1 \frac{5}{10}$ inch.
Hab. Hong-kong. In coll. Dr. O. Staudinger.
Allied to A. substrigosa, Walker, from Assam, aud to $A$. socrus, Hübn. Zutr. f. 837, from Java.

## Artaixa unimacula, n. sp.

Male and Female. Fore wing clear ochreous, with a broad median transverse, pale-bordered, darker band, which is less apparent in the female ; a single black spot before the apex. Cilia whitish. Hind wing yellowish white. Abdomen brownish, tuft ochreous.

Expanse, of $1 \frac{3}{3}$, 우 $1 \frac{5}{8}$ inch.
Hab. Khasia hills (G.-Austen), In coll. F. Moore.
Allied to A. diagramma, Boisd.; distinguished by having but a single apical black spot, and in the difference of the colour of the abdomen.

Artaxa leithiana, n. sp. (Plate XXXII. fig. 9.)
Male and Female. Upperside pale yellow: fore wing with a median transverse, recurved, oblique, black maculated band, terminating within end of the cell and not extending hindward to the margin. Abdomen ochreous. Underside-fore wing in male dusky
brown along anterior border. Palpi dusky brown at the side. Fore legs ochreous-brown in front.

Expanse, of $1 \frac{2}{8}$, ㅇ $1 \frac{5}{8}$ inch.
Hab. Bombay ( ${ }^{\prime}$ r. Leith), N. Canara (ITard). In coll. F. Moore.

Artaxa erecta, n. sp. (Plate XXXII. fig. 6.)
Female. Pale yellow: fore wing with a broad, median, transverse, erect, ochreous-brown speckled band.

Expanse 12 inch .
Hab. Canara, S. India (Ward). In coll. F. Moore.
Artaxa brevivitta, n. sp. (Plate XXXII. fig. 10.)
Male. Ochrey-yellow, paler on hind wing : fore wing with a broad, black-speckled, short band, extending from middle of hind margin upward to end of the cell. Underside of anterior border ochreous.

Expanse $1 \frac{1}{8}$ inch.
Hab. Bengal (Russell). In coll. F. Moore.
Allied to A. howra, Moore, from Calcutta. Distinguished from it by the broad band on hind margin and in the absence of a black cellspot.

Euproctis subdita, n. sp.
Male. Upperside white: hind wing with the anterior border and apex thickly irrorated with brown scales; anal tuft bright yellow. Underside-fore wing with the anterior border broadly dusky black: hind wing with the anterior border narrowly speckled with brown. Antenne dusky brown, shaft white.

Exp. 1 inch.
Hab. Ceylon. In coll. F. Moore.
Allied to E. aurifua of Europe. Distinguished by its smaller size and absence of markings on the fore wing.

Euproctis flayonigra, n. sp. (Plate XXXII. fig. 11.)
Male. Upperside-fore wing yellow: hind wing dark ochreousbrown. Body whitish; anal tuft yellow. Underside uniform dusky ochreous-brown. Cilia yellow. Anteunx blackish, shaft white. Legs yellowish abobve, white beneath.

Expanse $1 \frac{1}{8}$ inch.
Hab. Nepaul (Gen, Ramsay). In coll. F. Moore.
Allied to E. subnigra, Moore, from Cherra Punji, and may be distinguished from it by the difference in colour.

Euproctis postincisa, n. sp. (Plate XXXII. fig. 5.)
Female. White: fore wing with a median, transverse, narrow, black band, which is outwardly angled at the cod of the cell; short oblique black line from posterior angle.

Expanse $1 \frac{4}{10}$ inch.
Heb. N.E. Bengal (A. Grote). In coll. F. Moore.

## Pida albodentata, n. sp.

Female. Upperside dull ochreous-white: fore wing minutely brownspeckled ; a broad, transverse, median, ochreous-brown speckled band crossed by pale veins; a row of white dentate spots along outer margin. Underside paler, without markings.

Expanse $1 \frac{7}{8}$ inch.
Hab. N.W. Himalaya. In coll. F. Moore.
Redoa cygna, n. sp.
Male and Female. Wings silky white, covered with minute silvery scales: fore wing with a small black spot at end of the cell. Body and legs white. Front of head, tip of palpi, and legs spotted with dark brown.

Expanse 16 inch.
Hab. N.E. Bengal (A. Grote). In coll. F. Moore،

## Caltura, n. g.

Wings broad: fore wing trigonal, elongated in female; costa arched at base, apex rounded, exterior margin oblique ; first branch of subcostal vein starting from some distance before the end of the cell, second quadrifid, fifth or lowest being nearest the cell ; discocellulars bent in the middle, upper angled; radial from angle of upper discocellular; median vein four-branched, two upper from angles at end of the cell : hind wing broad, apex and exterior margin very convex; subcostal two-branched from angle at end of the cell; upper discocellular short, lower long and very oblique ; median vein as in fore wing. Body moderate; abdomen as long as hind wing. Palpi pilose, porrect. Legs covered with short spinous hairs. An. tennæ bipectinate.

## Caltura alba, n. sp.

Male and Female. White, semidiaphanous, covered with raised white scales: fore wing with two transverse black lines, the first subbasal and zigzag, the other discal, oblique, and bent near the costa; a short, oblique, discocellular black streak; both wings with a marginal row of small black spots. Thorax black-spotted; abdomen in male with dorsal and lateral row of black spots. Legs hoary above.

Expanse of $1 \frac{6}{8}$, 오 $2 \frac{3}{8}$ inches.
Hab. Ceylon (Sir W. Gregory). In coll. Dublin Museum.

## Dasychira rausalia, in. sp.

Male. Upperside pale brownish grey: fore wing minutely irrorated with black scales, crossed by indistinct basal, discal, and marginal sinuous dusky lines; a lunule at end of the cell: hind wing pale greyish brown, yellowish on abdominal margin ; cilia whitish; an indistinct dusky spot at end of the cell. Underside paler; both wings with a dusky brown, broad, dentate streak at end of the cell, and a transverse, discal, indistinct fascia.

Expanse 14 inch.
Hab. Kussowlee, N.W. Himalaya. In coll. F. Moore. Proc. Zool. Soc.-1879, No. XXVI.

Near to D. horsfieldi, Saunders, from Java and S. India. It may possibly prove to be the male of D. strigata, Moore (Asiat. Soc. Beng. Desc. Lep. Atk. Coll. p. 59), described from a female in the collection of Dr. Staudinger from Gurhwal.

## Lymantria sobrina, n. sp. (Plate XXXIII. fig. 5.)

Male and Female. Greyish vinous brown, palest and greyer in the female: fore wing crossed by five black zigzag bands, the three interior broad, the two outer narrow and sinuous; a marginal row of small triangular spots, which also cross the cilia; a spot within the cell crossing the second band; two spots below the cell. Abdominal border and abdomen in male reddish, ochreous in female, the abdomen with black bands. Collar reddish. Underside pale brown, with the costa and outer borders pale ochreous and black-spotted, the base of hind wing also pale ochreous and brown-streaked. Leys with blackish bands.
${ }^{7}$ Expanse, of 2, $92 \frac{5}{8}$ inches.
Hab. Dharmsala, N.W. Himalaya. In coll. F. Moore.
The markings in this species are disposed on the fore wing similarly to those in $L$. superans.

## Lymantria todara, n. sp. (Plate XXXIII. fig. 6.)

Male. Fore wing pure white, crossed by narrow, not very prominent, black zigzag lines, basal spots, a spot in the cell, and a marginal series of spots: hind wing and abdomen pale yellowish ochreous, the former with a rather broad marginal brown band. Underside pale ochreous-white; markings of upperside very indistinct. Palpi black at the side. Legs black-streaked. Thorax white above, with black spots.

Expanse $1 \frac{7}{8}$ inch.
Hab. Nilgiris, S. India. In coll. F. Moore.
Lymantria similis, n. sp.
Male. Fore wing greyish white, crossed by narrow black zigzag lines, basal and marginal spots, and small spots in the cell : hind wing greyish brown, with black marginal spots. Head and thorax white, the latter black-spotted. Abdomen reddish, with black bands. Palpi black at the side. Legs black-spotted. Antennæ brown, shaft white. Underside pale ochreous-brown, with costal and marginal blackish spots, and indistinct transverse bands.

Expanse $1 \frac{7}{8}$ inch.
Hab. Calcutta district (Farr.). In coll. F. Moore.
Allied to $L$. monacha and $L$. superans, markings on fore wing similar, but narrower, hind wing being broader and without the marginal band.

## Lymantria vinacea, n. sp.

Female vinous-grey: fore wing crossed by indistinct brownish zigzag bands; marginal spots and a spot at end of the cell : hind
wing with narrow brown marginal band. Thorax brown. Palpi and legs brown-streaked. Underside brighter-coloured.

Expanse $1 \frac{7}{8}$ inch.
Hab. Canara, S. India (Ward). In coll. F. Moore.

## Lymantria sinica, n. sp.

Male greyish brown : fore wing crossed by darker zigzag innerbands, and an outer broader lunular whitish speckled band; an angled blackish streak at end of the cell, and a marginal series of small spots: hind wing with indistinct darker marginal band. Underside paler, with very indistinct costal and marginal spots, and a spot at end of the cell. Thorax brown, collar red. Abdomen reddishtinged. Palpi dusky black at the side. Legs with black bands.

Expanse $1 \frac{4}{8}$ to $1 \frac{6}{8}$ inch.
Hab. N. China (Shanghai) and Formosa. In coll. F. Moore.
Lymantria albolunulata, n. sp.
Male and Female. Greyish brown. darkest in female : fore wing crossed by indistinct, black-speckled, sinuous bands, and marginal row of spots, the outer band lunular and white-speckled; a prominent black-angled mark at end of the cell, a narrow streak before it, and broader straight streak below the cell: hind wing with indistinct maculated marginal border and cilia. Thorax dark brown, with slight red collar. Abdomen reddish, with brownish bands. Underside pale brown, with blackish costal and marginal spots, and indistinct angled mark at end of the cell. Palpi reddish and black at the side. Legs slightly reddish and black-streaked.

Expanse, of $1 \frac{4}{8}$, 오 $2 \frac{1}{8}$ inch.
Hab. Simla, Dharmsala, N.W. Himalaya. In coll. F. Moore.

## Fam. Notodontide.

Moma champa, n. sp. (Plate XXXIII. fig. 2.)
Male and Female. Cinereous white, slightly vinous-tinted in the male. Cilia alternated with black. Fore wing with black basal and costal zigzag streaks, a double subbasal and discal transverse sinuous lines, the intermediate space streaked and spotted, and suffused with black hindward; an oval ringlet near end of the cell; a submarginal interrupted broader sinuous line, and marginal row of short, narrow, straight, longitudinal streaks : hind wing dusky at the apex, yellowish on abdominal border, veins externally and a marginal line black. Head and thorax white, transversely black-streaked. Abdomen yellowish, with dorsal row of black and white tufted spots ; apical tuft white in male. Underside-fore wing blackish anteriorly, costa white-spotted : hind wing with short black apical and discal band, costal streak, a small spot at end of the cell, and veins externally black. Palpi white, the tip and a lateral streak black. Legs white with black bands. Allied to M. ludifica, of Europe.

Expanse, of $1 \frac{4}{8}$, of $1 \frac{5}{8}$ inch.
Hab. Dharmsala, N.W. Himalaya. In coll. F. Moore.

Stauropus albescens, n. sp.
Greyish white ; fore wing, and hind wing along anterior border, minutely brown-speckled : fore wing with very indistinct, median, transverse, sinuous bands, and a submarginal series of ochreous-brown spots. Abdomen with a dorsal series of blackish-speckled tufts. Underside white. Palpi and legs brown-streaked.

Expanse 2 inches.
Hab. Mangalore, S. India (Ward). In coll. F. Moore.

## Stauropus indicus, n. sp.

Upperside pale ochreous-grey ; cilia alternated with brown : fore wing with the basal half and costal border densely clouded with dark brown scales indistinctly disposed in confluent sinuous bands; apical half sparsely brown-speckled; a submarginal oblique row of brown pale-speckled points: hind wing with the anterior border and apex broadly brown-speckled, indistinctly disposed in sinuous bands; abdominal border sparsely speckled; a brown-speckled marginal line and pale lunular spaces. Body greyish brown, tip ochreous-grey. Underside paler, without speckles. Front of head and palpi dark brown. Antennæ brown, shaft grey.

Expanse $1 \frac{4}{8}$ inch.
Hab. N.E. Bengal (A. Grote). In coll. F. Moore.
Stauropus virescens, n. sp.
Male. Upperside-fore wing pale green, with two equidistant, transverse, median, brown-speckled sinuous lines, the outer double and pale grey-bordered; an indistinct row of submarginal, pale, grey-bordered, brown-speckled spots, and a more prominent row of marginal brown spots; cilia whitish: hind wing with the costal border green, and crossed by brown wavy streaks, the rest of the wing pale brown. Front of head and thorax green; abdomen pale brown, tipped with pale green. Antennæ brown, shaft grey. Underside pale greenish grey. Fore and mid legs green and brownspeckled above, grey beneath; mid legs greenish grey. Palpi ochreous-grey, dark brown at the side.

Expanse $\frac{1}{10}$ inch.
Hab. Darjiling (A. Grote). In coll. F. Moore.

## Stauropus vinaceus, n. sp. (Plate XXXIII. fig. l.)

Upperside-fore wing vinous-brown, irrorated with grey scales; base obliquely grey, and bordered by a narrow black line; a submarginal indistinct black sinuous line, and an outer marginal series of short, black, grey-bordered zigzag streaks: an indistinct pale vinous longitudinal fascia above the hind margin, a similar one from helow end of the cell, and a shorter one before the apex : hind viny brown. Abdomen greyish brown. Thorax brown, speckled with grey hindward. Underside pale rufous-brown, greyish along hind margins. Palpi and legs black-speckled.

Expanse 2 inches.
Hab. India. In coll. F. Moore.

Sphetta apicalis, n. sp. (Plate XXXIII. fig. 7.)
Male. Upperside-fore wing dark umber-brown, with a pale testaceous black-streaked patch from the apex of costa, which terminates in an oblique paler reniform mark at the end of cell; a small pale testaceous spot in middle of the cell; the space immediately below the apical patch black-speckled; a subbasal and discal pale narrow sinuous band, and a marginal series of black points: hind wing and abdomen fuliginous-brown. Underside pale silky-testaceous, with brownish outer borders and pale marginal points: hind wing with an indistinct brown lunule at end of the cell, and a curved discal narrow band. Thorax above and vertex black-speckled ; palpi black at side; fore and middle legs blackish above; antennæ brown.

Expanse $1 \frac{5}{8}$ inch.
Hab. Darjiling. In coll. F. Moore.

## Sphetta biocellata, n. sp.

Female. Upperside ferruginous-brown : fore wing with the costal border its entire length longitudinally marked with short blackish dentate streaks; a pale testaceous apical patch, the lower border of which is black, its shape being sinuous from the apical angle and then straight to end of the cell ; an oval pale spot with a blackish centre at end of the cell, and a darker similar spot, with black intermediate space, within the cell; a blackish subbasal transverse sinuous double line, a similar line curving upward from its base to below the end cell-spot ; veins on the disk with short black streaks; a pale submarginal indistinct narrow fascia, and a row of black dentate marginal points: hind wing and abdomen pale ferruginousbrown. Underside paler, with darker interspaces between the veins on the fore wing, and streaks along the veins on hind wing; both wings with a blackish spot at end of the cell, and black dentate marginal line.

Expanse 2 $\frac{1}{8}$ inches.
Hab. Bombay. In coll. F. Moore.

## Gluphisia sinuata.

Female. Fore wing with a brownish ochreous band along exterior margin, bordered within by a sinuous irregular black line; from the band to the base the wing is speckled with black, showing a slightly prominent spot at end of the cell and streaks on middle of hind margin : hind wing cinereous-brown, with a slight dusky streak at end of the cell and indistinct median transverse band. Body cinere-ous-brown. Underside pale cinereous-brown, with indistinct streak at end of cells and band on hind wing.

Expanse $1 \frac{4}{8}$ inch.
Hab. N.E. Bengal. In coll. W. B. Farr.
Raceia flumosa. (Plate XXXIV. fig. 1.)
Rachia plumosa, Moore, Asiat. Soc. Beng. Desc. Lep. Atk. Coll. p. 70 (1878).

Hab. Darjiling. In coll. Dr. Staudinger and F. Moore.

# Fumily Bombycide. 

Aristifala, Moore.
Aristhala, Moore, P. Z. S. 1878, p. 704.
Aristhala sikkima, n. sp. (Plate XXXIII. fig. 3.)
Male. Greyish ferruginous : fore wing purple-brown below the cell and along exterior border; a white-bordered bent subbasal and a zigzag transverse discal blackish line, two blackish median transverse fasciæ and an oblique streak from middle of costa to outer median fascia, two semidiaphanous white spots on middle of exterior border; cilia black-streaked: hind wing with two purple-brown median curved transverse and short subbasal bands, two semidiaphanous white spots, bordered above with purple-brown streaks on exterior margin near angle, the angle brighter ferruginous; abdominal margin and fringe grey and purple-brown. Underside-fore wing yellowishferruginous; two discal transverse brown bands: hind wing brighter ferruginous, two curved discal bands, two small black discocellular spots, and a purple-brown grey-speckled fascia near abdominal margin from base to white subbasal spots.

Female. Brighter yellowish ferruginous: fore wing clouded with dark purplish ferruginous along posterior and exterior borders, and kind wing at base and angle; transverse markings and white spots less distinct. Thorax greyish-ferruginous in male, dark ferruginous in female; abdomen dull ferruginous, hoary in male ; antennæ deep ferruginous; front of head and legs brighter ferruginous.

Expanse, of $1 \frac{3}{4}$, 오 $2 \frac{3}{8}$ inches.
Hab. Darjiling. In coll. F. Moore and British Museum.

## Hanisa, n. g.

Fore wing trigonal ; costa slightly concave near the base, apex rounded, exterior margin very oblique and angular in the middle, hind margin short; costal and subcostal veins contiguous to margin ; subcostal vein five-branched, first and second branches parallel, third trifurcate, the lower fork terminating below the apex ; upper radial starting from upper end of the cell ; cell narrow, short ; a discoidal vein emitted within the cell; lower radial from middle of discocellulars; median vein three-branched, middle branch terminating at angle on exterior margin, submedian straight. Hind wing elongated hindward, convex externally ; abdominal margin long, extending to end of abdomen, fringed and slightly produced at anal angle; subcostal vein two-branched; cell short; median vein three-branched. Body long, slender ; anal tuft fan-shaped. Antennæ short, broadly bipectinate; legs short, pilose.

Allied to genera Aristhala, Trilocha, Ocinara, and to Bombyx (B. mori).

## Hanisa subnotata.

Bombyx subnotata, Walk. Journ. Linn. Soc. iii. p. 188 (1859).
Hab. Singapore ( Wallace). In coll. Saunders, Oxford University Museum.

## Family Drepanulide.

## Drepana specularis, n. sp.

Female. Upperside pale testaceous-brown : fore wing with the veins externally and a transverse submarginal oblique narrow band pale testaceous-yellow; a dark-bordered paler blotch at base, below and beyond the cell; the rest of the wing numerously covered with short pale strigæ ; a narrow dusky lunule at end of the cell ; a marginal row of small black-speckled spots : hind wing pale testaceousyellow anteriorly, dark brown posteriorly, and lined with pale veins and traversed by short pale strigæ; a narrow pale band crossing the disk, ontside which aretwo median, oval, contiguous semidiaphanous pale spots; a marginal row of black-speckled spots. Underside black-speckled; transverse band on both wings black and broader; marginal speckled spots confluent on hind wing ; shaft of antennæ white; pectinations and legs brown.

Expanse $2 \frac{1}{2}$ inches.
Hab. Ceylon (Sir W. Gregory).

## Family Lasiocampide.

Mustilia sphingiformis, n . sp. (Plate XXXIII. fig. 4.)
Male and Female ochreous-red, darkest along external border of fore wing and on abdominal half of hind wing : fore wing with an oblique indistinct brown wavy line from apex to near posterior angle, and two median transverse irregular brown lines, retracted inward to costa; an indistinct costal streak before the apex, and a small dot at end of cell: hind wing dull yellowish on anterior border. Underside dull yellowish ochreous: fore wing with an indistinct curved brown line from apex, and hind wing with two transverse median indistinct lines; shaft of antennæ and narrow frontal band at base white.

Expanse, of 2, 오 3 inches.
Hab. Masuri, N.W. Himalaya (Major Hutton). In coll. F. Moore.

## Kosala, n. g.

Female. Fore wing somewhat short and narrow; costa arched near end, apex acute, exterior margin slightly oblique, posterior angle convex; first branch of subcostal vein arising at half length of the cell, second near its end and forked at one third its length, fourth from end of the cell and also forked at one third its length; discocellulars slender, curved inward; radial from upper end of the cell; median vein four-branched, the two upper from end of the cell; submedian running near the margin. Hind wing truncated; anterior margin short, angled at apex ; exterior margin truncated, convex in middle; hind margin long, nearly straight; subcostal branches straight, from near base of the cell; median four-branched, the branches contiguous at their base; a median and internal vein. Body robust, extending slightly beyond hind wing ; antenne bipec-
tinate, the pectinations short and broad; legs pilose; palpi stout, robust, densely pilose, extending slightly beyond the head.

Allied to Eutricha.
Kosala sanguinea, n. sp. (Plate XXXIII. fig. 8.)
Female. Upperside deep red: fore wing with two indistinct median transverse narrow black lines, the inner slightly curved, the outer oblique ; an indistinct outer zigzag series of blackish marks; a grey-speckled patch at the apex; a white angular discocellular spot between the transverse black lines: hind wing duller red posteriorly; an indistinct black grey-speckled streak below the apex; apical border grey-speckled. Underside reddish brown; both wings crossed by an indistinct narrow dusky discal fascia.

Expanse $2 \frac{1}{8}$ inches.
Hab. Khasia hills (Godwin-Austen). In coll. F. Moore.
Eutricha cheela, n. sp.
Allied to E. pini.
Male. Upperside reddish fawn-colour : fore wing with an exterior submarginal deeply sinuous black line, from near which the interdiscal space is bright dark ferruginous and traversed with irregular transverse dusky black lines. Underside brownish fawn-colour; both wings with an oblique transverse darker brown median band, and an indistinct outer lunular band.

Expanse $2 \frac{1}{2}$ inches.
Hab. Dharmsala, N.W. Himalaya. In coll. Lahore Museum.
Odonestis pyriformis, n. sp. (Plate XXXIV. fig. 7.)
Male. Upperside deep ferruginous, washed with purple externally; fore wing with a narrow transverse subbasal curved line, and an oblique recurved discal line with pale outer border; an outer submarginal dusky sinuous line; a large whitish red-centred oblique pyriform spot at end of the cell, and a small white spot above it. Underside paler ; both wings crossed by an indistinct dusky discal fascia.

Expanse $1 \frac{1}{2}$ inch.
Hab. Masuri, N.W. Himalaya. In coll. Major A. M. Lang and F. Moore.

Allied to $O$. decisa, Walk. Differs in being smaller, the wing shorter and darker in colour, and having a prominent large cell-spot, the discal line being less oblique. From O. lata and O. inobtrusa it is also distinct.

## Odonestis divisa, n. sp.

Female. Upperside-fore wing dark chestnut-red, dusky red posteriorly, and washed externally with purple-grey ; a narrow palebordered line recurving from apex to middle of hind margin; a large pearly-white red-speckled spot at end of the cell, and a small white spot above it: hind wing dark chestnut-red along anterior half, pale purplish red on posterior half, the two colours defined by
a straight division. Thorax, head, palpi, and legs dusky red; abdomen pale purplish red. Underside duller-coloured.

Expanse 25 inches.
Hab. Ceylon (Sir W. Gregory). In coll. Dublin Museum.
Messata enescens, n. sp.
Male. Upperside ænescent-yellow: fore wing with three very prominent oblique, transverse, discal purple brown-speckled bands, the two inner bands linear and curved, the outer one composed of broad lunules; an inner series of three less oblique, very indistinct, and sparsely speckled bands : hind wing with a distinct submarginal broad purple brown-speckled lunular band. Thorax, head, and fore legs dark ochreous-yellow. Underside duller-coloured, with the bands as above, very indistinct.

Expanse 24 ${ }^{\frac{4}{8}}$ inches.
Hab. Ceylon (Sir IV. Gregory). In coll. Dublin Museum.
May be distinguished from M. plumipes (Dreata plumipes, Walk. Catal. Lep. B. M. iv. p. 907) by the curvature and greater obliquity of the bands on the fore wing, and by the lunular submarginal band on the hind wing.

## Messata quadrifasciata, n. sp.

Male. Upperside brownish ochreous: fore wing numerously speckled with black scales; two oblique transverse black discal bands, the inner band broad and very prominent: hind wing with two black-speckled bands, the inner median, the outer indistinct. Thorax, head, and underside brighter ochreous; the inner band on both wings prominent.

Expanse 23 inches.
Hab. Colombo, Ceylon (Hutchison). In coll. F. Moore.
Messata fraterna, n. sp. (Plate XXXIV. fig. 6.)
Female. Upperside reddish-ferruginous, palest on hind wing: fore wing with two oblique, submarginal, indistinct, narrow dusky bands, and hind wing with a single outer band. Underside much paler.

Expanse 2 inches.
Hab. Bombay (Dr. Leith). In coll. F. Moore.
Messata vialis, n . sp.
Male. Upperside luteous-brown: fore wing with a prominent oblique discal black band with pale yellow outer border : hind wing with a very indistinct median and submarginal transverse dusky bands. Underside paler ; a dusky oblique band on fore wing slightly apparent. Front of head, palpi, and legs above dark brown.

Expanse $2 \frac{3}{4}$ iuches.
Hab. Ceylon (Sir W. Gregory). In coll. Dublin Museum and F. Moore.

Eupterote, Hübner.

> (Dreata (part.), Walker.)

## Eupterote ochripicta, n. sp.

Male and Female. Allied to E. fabia (Cram. Pap. Exot. pl. 250. f. B). Upperside deep ochreous-yellow : fore wing with four purplebrown transverse subbasal and three discal narrow sinuous bands, an intervening median broader maculated band, a straight submarginal speckled band, which is widest and with a narrow outer line in female, and an exterior zigzag band, the interspace between the two latter, in the male, maculated and darker-blotched at anterior and near posterior end : hind wing with four sinuous discal bands, and a straight submarginal and zigzag outer band, with maculated interspace in male and a narrow line in female; markings in female strongest.

Expanse 5 inches.
Hab. Ceylon. In coll. F. M. Mackwood and F. Moore.

## Eupterote canaraica, n. sp.

Male. Upperside reddish-ochreous, paling to yellowish-ochreous on the costal border and base; both wings crossed by two indistinct darker discal lunular bands, a contiguous straight band, and an outer or submarginal wider lunular band, the interspace between the latter and the straight band traversed by triangular marks, which are most prominent on the fore wing. Underside paler, marked as above; palpi at the side and streaks on the legs blackish. Female more uniform yellowish-ochreous, marked as in the male.

Expanse 2 $\frac{6}{8}$ inches.
Hab. Canara, S. India ( $W_{\text {ard }}$ ). In coll. F. Moore.

## Lasiocampa bhira, n.sp. (Plate XXXIV. fig. 2.)

Male. Upperside bright ferruginous, palest on the disk: fore wing with the costal edge yellow; four transverse white lines, two being subbasal and straight, and two discal recurving outward to the costa; beyond these is a fifth, transverse fuliginous line. Underside yellowish ferruginous, but darker ferruginous exteriorly; veins and scarcely pereeptible transverse streaks yellow.

Expanse $1 \frac{3}{4}$ inch.
Hab. Dharmsala, N.W. Himalayas. In coll. Lahore Museum.

## Suana cervina, n. sp.

Female. Upperside dark brownish fawn-colour: fore wing greyspeckled, crossed by four indistinct median transverse dusky lunular bands, the two inner bands bent across the cell towards base of costa; an outer submarginal band of blacker and broader palebordered lunules; a grey-white spot at base of wing, and a prominent large silvery-white spot at end of the cell: hind wing with a very indistinct dusky-brown submarginal fascia. Thorax, head, and palpi dark purplish black; tibix and tarsi above black; abdo-
men reddish; antennæ grey. Underside uniform brownish fawncolour.

Expanse $3 \frac{3}{4}$ inches.
Hab. Ceylon (Sir W. Gregory). In coll. Dublin Museum and F. Moore.

Distinguished frorn S. bimaculata, which is also found in Ceylon, in being a third less in size and of a very much darker colour. The larva, of which drawings of both species are before me, is also differently marked from that of S. bimaculata.

Brachylia, Felder.

Brachylia, Felder, Nov. Voy. Lep. v. pl. 82. f. 7.
Brachylia acronyctoides, n. sp. (Plate XXXIV. fig. 4.)
Male and Female. Upperside-fore wing greyish-brown, greyest at the apex, crossed externally by black wavy, partly interrupted reticulations, some of which are disposed in an outwardly oblique line across the disk: hind wing pale greyish brown, indistinctly marked with black reticulations. Underside fuliginous brown, reticulations somewhat confluent and darkest in male; abdomen greyish brown, paler beneath, and with pale bands above; antennæ dark brown.

Expanse $1 \frac{3}{8}$ to $1 \frac{5}{8}$ inch.
Hab. Bombay (Dr. Leith). In coll. F. Moore.

## Arbela, n. g.

Fore wing elongated ; costa nearly straight, exterior margin oblique and slightly convex; posterior margin convex at base; third subcostal vein trifid, first fork ascending at one third beyond end of the cell, second from one third before the apex : hind wing short, exterior margin very convex. Antennæ short, closely bipectinate; head small, palpi minute ; body slender, hairy; abdomen extending one third beyond hind wing, with short dorsal lax tufts and longer anal tuft; legs hairy on one side.

Arbela tetraonis, n. sp. (Plate XXXIV. fig. 3.)
Allied to A. quadrinotata, Walk.
Male. Upperside pale greyish ochreous: fore wing crossed by numerous compact dark-brown maculated bands, spot at end of the cell black : hind wing sparsely crossed by brown strigæ ; cilia alternate pale and dark brown. Body greyish brown, interspersed with dark brown tufts. Antennæ and legs pale ochrey-brown. Underside greyish white, with the markings less prominent.

Expanse $1 \frac{7}{8}$ inch.
Hab. Bombay (Dr. Leith). In coll. F. Moore.

## Arbela tessellata.

Cossus tessellatus, Moore, Asiat. Soc. Beng. Desc. Lep. Atk. Coll. p. 85 (1878).

Hab. Calcutta.

Arbela quadrinotata.
Cossusq uadrinotatus, Walker, Catal. Lep. Het. B.M. vii. p. 1521. Hab. Ceylon.
Phassus salsettensis, n. sp. (Plate XXXIV. fig. 5.)
Male. Upperside :-fore wing ferruginous-brown, crossed by a subbasal and median band formed of dull chalybeate quadrate spaces between the veins, and outer rows of similar decussated marks: hind wing fuliginous-brown; costal border and cilia ferruginous-brown. Thorax and legs dark fuliginous-brown, abdomen pale. Underside dark fuliginous-brown.

Expanse 23 $\frac{3}{8}$ inches.
Hab. Bombay (Dr. Leith). In coll. F. Moore.
Phassus malabaricus, n. sp.
Male. Pale umber-brown : fore wing with broad pale greyish chalybeate streaks, with dark-brown borders on the costa, a triangular space in the cell, narrow streaks on hind margin from the base, and transverse discal and submarginal band formed of quadrate marks; a yellow lunule ascending obliquely from end, and a longitudinal narrow mark near base of the cell: hind wing ochreousbrown along the costa, greyish at base. Abdomen greyish at base.

Female. Pale brownish ochreous; markings as in male, except that the yellow mark at end of the cell is tear-shaped.

Expanse, of $3 \frac{3}{4}$, ㅇ $4 \frac{3}{4}$ inches.
Hab. Sircy, N. Canara (Ward); Ooty, Niligiris (Dr. Day). In coll. F. Moore.

## Phassus chalybeatus, n. sp.

Male. Fore wing pale ferruginous, greyish at the base and along outer margin ; some greyish chalybeate brown-bordered spaces on the costa, a broad triangular spåce across middle of the cell, a wavy band across the disk, a submarginal row of duplex lunules or letter-X-shaped marks, and narrow streaks on hind margin ; a serial row of dark-brown dots between the chalybeate discal band and submarginal lunules; a narrow white upright lunule at end, and a similar though less apparent lunule near base of the cell: hind wing pale ferruginous, veins darker, with some narrow greyish chalybeate streaks on costa near the apex. Thorax and legs ochreous-brown. Abdomen paler.

Female. Upperside dark ferruginous: fore wing with some darker quadrate spots on costa; discal and submarginal bands formed of indistinct, mostly quadrate, chalybeate irregular spaces between the veins; the interspaces between the bands darker ferruginous; a recurved chalybeate streak from the base, and short streaks on hind margin: hind wing brownish ferruginous, palest at the base ; some pale chalybeate marks on costa near apex. Underside uniform pale ferruginous. Palpi and legs dark ferruginous.

Expanse, of 3, ㅇ 5 inches.
Hab. Darjiling (A. Grote). In coll. F. Moore.

Phassus albofasclatus, n. sp. (Plate XXXIV. fig. 8.)
Male. Upperside pale umber-brown, darkest on costal border of both wings: fore wing with an indistinct, whitish, longitudinal median fascia from base to below apex, which is slightly blackspeckled; a few black delicate streaks on hind margin from the base; a series of black dots on outer margin. Thorax, palpi, and legs dark umber-brown. Abdomen paler, with a yellow lateral streak near the base. Underside uniform umber-brown.

Expanse 21 $\frac{1}{8}$ inches.
Hab. Nilgiris. In coll. F. Moore.

## Hepialus sexnotatus, n. sp.

Upperside ochreous-brown : fore wing crossed by four curved, darker, maculated indistinct bands, the outer band marginal and slightly yellow-speckled; a blackish spot on middle of hind margin, and a yellow streak nearer the base; a rather large round white spot crossing the cell near the base, and two smaller spots below the cell and nearer the base; some yellow-speckled oblique streaks on costa before the apex: hind wing with the base ochreous, and a broad yellow band on cilia in middle of outer margin. Body ochre-ous-brown, base of abdomen with long ochreous hairs. Underside ochreous at base of both wings; cilial band as above.

Expanse $1 \frac{4}{8}$ inch.
Hab. Darjiling. In coll. F. Moore.
Hepialus murinus, n. sp.
Male. Upperside umber-brown : fore wing with a small triangular yellow spot within the cell near the base, and a smaller round spot beneath it near the base of the wing. Cilia on hind wing below the apex yellow. Underside uniform umber-brown.

Expanse ${ }^{\frac{1}{10}} \frac{1}{10}$ inch.
Hab. Dharmsala, N.W. Himalaya. In coll. F. Moore.

## Pyrales.

## Fam. Ægeridde.

Melittia gigantea, n. sp.
Margins and veins dark brown ; apical border narrow, speckled with purple-grey scales; costal border and hind margin at their base ochreous; apical area large, traversed by four veins; basal area traversed by median vein and a short discuidal vein. Abdominal area of hind wing ochreous-red. Cilia of both wings purplish cinereous. Head in front and thorax dark ochreous, reddish at base. Abdomen above purple-brown, marked with ochreous scales, segmental bands narrow and yellowish, underside yellow. Palpi yellow, slightly fringed with black; pectus yellow. Fore and mid legs ochreous-red, yellow beneath. Hind legs densely covered throughout with long hairs, yellow on the inside of tibia, bright chestnut-
red on outside of tibia and tarsus, and black on inside of tarsus. Antennæ dull ferruginous, shaft black.

Expanse $1 \frac{1}{T 0}$ inch.
Hab. Masuri, N.W. Himalaya (Hutton). In coll. F. Moore.
Pseudosesia grotei, n. sp.
Margins, veins, and discocellular streak in both wings steel-blue; apical band and cilia purple; apical area traversed by four veins, basal area by median vein only. Thorax, frontal tuft, and abdomen steel-blue. Palpi and pectus fulvous. Legs steel-blue, fringed with short fulvous hairs above.

Expanse 12 $\frac{2}{8}$ inch.
Hab. N. India. In coll. F. Moore.
The genus Pseudosesia of Felder is allied to Melittia, but differs in the absence, on the hind wing, of the branch of the costal vein, in the two upper median branches starting together from end of the cell; the body is much more attenuated, the anal segment and the legs not densely pilose.

Geometres.

## Fam. Euschemide.

## Euschema bellissima, n. sp.

Male and Female. Blackish purple. Fore wing with two paleyellow, elongated, straight basal streaks, the upper within the cell, the lower beneath it, and a yellow spot above and another below the submedian vein; a large bluish-white diaphanous spot in middle of the cell, one below it, two at its end, and a transverse discal series of spots: hind wing with a broad yellow subbasal band, a median, irregular, indistinct fascia, a zigzag discal and a marginal series of small yellow spots. Body yellow, with black-purple bands. Underside as above, the yellow markings broader and more prominent.

Expanse, $0^{6} 2 \frac{1}{2}$, 아 $2 \frac{1}{8}$ inches.
Hab. Ceylon (Sir W. H. Gregory). In coll. Dublin Museum.
Nearest allied to the Bornean species, E. subrepleta, Walk.

## Euschema prunicolor, n. sp.

Upperside dark glossy purple: fore wing with an elongated and a short ochreous streak between the lower median branch and submedian vein; two small bluish diaphanous spots within the cell, two at its end, a subapical oblique series and three on the disk: hind wing with an indistinct, ochreous, short subbasal patch, some brighter ochreous small spots on the disk, a submarginal zigzag series, and a marginal dentate series. Abdominal border partly yellow. Body yellow; head, thorax, and abdomen above with purple bands. Palpi black-tipped. Antennæ purple-black. Underside-fore wing as above: hind wing with a short costal and subbasal band, and larger discal, submarginal, and marginal spots than above. Legs above grey, yellow beneath.

Expanse 23 $\frac{3}{8}$ inches.
Hab. Ceylon. In coll. Capt. Wade.

## Cusuma, n.g.

Differs from typical Euschema (E. militaris, Linn.) in the abbreviated and trigonal shape of the fore wing, the exterior margin being less oblique and the posterior margin shorter : neuration similar ; the discocellulars, however, are less acutely angled and not curved posteriorly: hind wing also shorter and more convex exteriorly. Thorax clothed with shorter and less shaggy hair. Palpi smaller, less pilose, terminal joint shorter and slightly clavate.

## Cuguma limbata, n. sp.

Female. Upperside-fore wing dark purple-black, with a bluish white, diaphanous, oblique subapical spot, crossed by two veins, and a small oblique spot within the cell: hind wing golden yellow, with a broad, wavy-bordered, purple-black marginal band, which extends narrowly along anterior margin and terminates in a spot at its base. Thorax, head, antennæ, dorsal bands, and tip purpleblack. Abdomen above and beneath, and sides of thorax, golden yellow. Legs black above, yellow beneath. Underside of wings as above.

Expanse 23 ${ }^{3}$ inches.
Hab. Ceylon. In coll. Capt. Wade.
Allied to C. vilis (Euschema vilis, Walk. Catal. Lep. Het. B. M. ii. p. 408), also from Ceylon.

## Fam.? Urapterygide.

Kalabana, n.g.
Fore wing somewhat elongated, costa slightly arched before the end, apex acute, slightly falcate, exterior margin oblique ; cell short, broad; first and second branches of subcostal vein arising before end of the cell, third trifurcate, lowest branch at one-half length from the cell ; radial from upper end of the cell ; discocellulars concave ; median vein three-branched, two upper from end of the cell; submedian vein contiguous to posterior margin. Hind wing trigonal, apex and exterior margin convex ; subcostal vein two-branched, first arising before end of the cell ; discocellulars angled in middle; median vein three-branched; a submedian and internal vein. Body short; head small. Palpi minute, pilose, porrect. Legs slender, sparsely hairy ; middle and hind spined. Antennæ in male bipectinate, the pectinations long and plumose, setose in female.

Type, K. picaria (Lagyra picaria, Walk. Catal. Lep. Het. B. M. pt. 26, p. 1541).

Hab. Јara.

## Kalabana albifera, n. sp.

- Female. Black : fore wing with a small white spot at apex, a short oblique irregular streak beyond the cell, and a conical spot on hind margin near the angle: hind wing with a broad white, slightly sinuous-bordered band, recurving from above anal angle to near middle of anterior margin. Underside as above.

Expanse $2 \frac{1}{8}$ inches.

Hab. Kulu, N.W. Himalaya. In coll. Dr. Staudinger.
Allied to K. picaria (Lagyra picaria, Walk.), from Java, and to K. leucomela (Celerena leucomela, Walk. Catal. B. M. v. p. 1877), from the Philippines.

## Fam. Amphidasyd.s.

## Buzura strigaria.

Male and Female. Cpperside cinereous-white: fore wing with a waved subbasal and median and a sinuous, broader, discal transverse ochreous-yellow band with black-speckled borders ; the interspaces numerously covered with short transverse black-speckled grey strigæ : hind wing with a waved median and a broad sinuous discal similar band, the interspaces as in fore wing; cilia ochreous. Thorax and abdomen with ochreous bands; front of head and legs above banded with black. Underside whitish ochreous, with numerous large black strigæ; both wings with outer ochreous band and a large black spot at end of the cell.

Expanse $\boldsymbol{\sigma}^{7} 2$, 오 3 iuches.
Hab. Ceylon (Sir W. H. Gregory). In coll. Dublin Museum and F. Moore.

Differs from the Indian species B. multipunctaria, Walk. Catal. Lep. Het. B. M. p. 1531, in its much brighter colours, prominent transverse strigæ, and black-speckled-bordered bands.

## Fam. Geometride.

Agathia magnifica, n. sp.
Male and Female. Upperside bright green: fore wing with the costal border, base of wing, a median and a submarginal transverse wary band, and the marginal border cinereous-brown: hind wing with a submarginal band and marginal border cinereous-brown; a white spot at lower angle. Thorax and abdomen with cineresusbrown bands. Uuderside greenish white, with dusky bands as above.

Expanse $1 \frac{11}{12}$ inch.
Hab. Ceylon (Sir W. H. Gregory). In coll. Dublin Muscum aud F. Moore.

Differs from A. lycenaria in its larger size, narrower and more waved bands, which are also of uniform width their entire length.

## EXPLANATION OF THE PLATES. <br> Plate XXXII.

Fig. 1. Ratarda marmorata ס', n. sp., p. 393.
2. Gonerda perornata d', n. sp., p. 395.
3. Thymara caudata, n. sp., p. 394.
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5. Euproctis postincisa ㅇ, n. sp., p. 400.
6. Artaxa erecta ㅇ, n. sp., p. 400.
7. Challa discalis ס̋, n. sp., p. 399.
8. Rajendra pannosa 우, n. sp., p. 397.
9. Artaxa leithiana ס̛, n. sp., p. 399.


Fig. 10. Artaxa brevivitta ${ }^{0}$, n. sp., p. 400.
11. Euproctis flavonigra J才, n. sp., p. 400.
12. Rajendra vittata, n. sp., p. 396.

Plate XXXIII.
Fig. 1. Stauropus vinaceus, n. sp., p. 404.
2. Moma champa, n. sp., p. 403.
3. Aristhala sikhima đ̋, n. sp., p. 406.
4. Mustilics sphingiformis ठ", n. sp., p. 407.
5. Lymantria sobrina ठ", n. sp., p. 402.
6. todara ó, n. sp., p. 402.
7. Sphetta apicalis ठ̃, n. sp., p. 405.
8. Kosala sanguinea, n. sp., p. 408.

## Plate XXXIV.

Fig. 1. Rachia plumosa õ, p. 405.
2. Lasiocampa bhira ${ }^{*}$, n. sp., p. 410.
3. Arbela tetraonis ס大, n. sp., p. 411.
4. Brachylia acronyctoides, n. sp., p. 411.
5. Phassus salsettensis, n. sp., p. 412.
6. Messata fraterna ㅇ, n. sp., p. 409.
7. Odonestis pyriformis ठ", n. sp., p. 408.
8. Phassus albofasciatus, n. sp., p. 413.
3. Descriptions of ten new Species of Axinea and Pectunculus in the Collections of Mr. Sylvanus Hanley and the late Mr. T. L. Taylor. By George French Angas, Corr. Memb., F.L.S., \&c.
[Received April 21, 1879.]
(Plate XXXV.)

1. Axinea pulcherrima, n. sp. (Plate XXXV. fig. 1.)

Shell solid, orbicular, convex, compressed and subangulate anteriorly, with an obtuse oblique ridge extending from the umbones to the anterior portion of the ventral margin, tawny yellow, clouded and zoned with bright chestnut, and irregularly spotted here and there with darker chestnut; valves finely concentrically striated on the upper part, and closely longitudinally corrugately ridged throughout the central portion of the valves, presenting the appearance of wider flattened ribs; umbones prominent; cardinal area moderate ; interior tinged with orange anteriorly; margins crenate.

Long. 15, alt. 15, lat. 10 lin.
Hab. Unknown. Coll. Hanley.
2. Axinea nova-caledoniensis, n. sp. (Plate XXXV. fig. 2.)

Shell solid, orbicular, subequilateral, equivalve, very slightly compressed and subangulate anteriorly, moderately ventricose; white, the central portion of the valves pale chestnut, fading gradually into

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white towards the base, and faintly rayed with darker chestnut, the rays forming a sort of band anteriorly, which ceases somewhat abruptly towards the white margin, whilst at the umbones the chestnut rays take the form of zigzag markings; valres sculptured with very minute close-set radiating striæ, crossed by fine, irregular, somewhat laminate strix, and towards the middle of the valves by concentric waving impressed lines that gire the shell a somerwhat wrinkled appearance; umbones central, tumid, a little incurved anteriorly ; cardinal area narrow; interior of ralves white; margins strougly crenate.

Long. 18, alt. 18, lat. 11 lin.
Hab. New Caledonia. Coll. Hanley.

## 3. Axinea hanleyt, 13. sp. (Plate XXXV. fig. 3.)

Shell solid, trimgularly orate, anded aud compressed anteriorly, ventricose; pale orange, darker at the sides and towards the base, very leantifully painted with small, irregular, trianmular chestnut lines that pass into confused descending rays towards the base, and with larger triangular white spots here and there, especially near the anterior risargin, where they form a kind of broken white band descending from the umbones, and marked with two or three zigzag dark purple lines; valres sculptured with fine, regular, close-set, descend. ing raised strix, more distant towards the anterior ara, and crossed by minute concentric ridges; umbones very tumid; cardinal area short and deep; interior of the valres white spotted with dark purple anteriorly; margins strongly crenate.

Long. 14, alt. 15, lat. 10 lin.
Mab. Unknown. Coll. Hanley.

## 4. Axinea modesta, n. sp. (Plate XXXV. fig.4.)

Shell solid, somewhat obliquely orate convex, slightly subangulate anteriorly, equivalve; whitisi, faintly marked with numerous indistinct pale-brown angular lines, with here and there a very few descending: straight chestnut markings towards the base anteriorly ; ralres sculptured with fine close-set elerated strix, less numerous towards the umbones, and crossed with a few very minute concentric strix, and with strongly marked lines of growth that have a frilled appearance towards the ventral margin, which is clothed with a short brief epidermis; cardinal area small; umbones incurred anteriorly, brown, tinged with livid blue; interior of valves pale yellow, with a dark purple stain in front; margins crenate.

Long. $8 \frac{1}{2}$, alt. 9, lat. 5 lin.
IIab. Australia. Coll. Hanley.

## 5. Axinea bella, n. sp. (Plate XXXV. fig. 5.)

Shell moderately solid, suborbicular, a little convex, subequilateral, equivalve; white, with pale yellowish brown arrow-shaped markings towards the centre of the valves, and with longitudinal patches and splashes of dark purplish brown, larger and more numerous towards the base; valves sculptured throughout with fine close-set raised striæ which are crossed by very delicate thread-like concentric lines; cardimal area small and narrow; umbones nearly approximate, livid
blue spotted with brown ; interior of the valves faintly stained with purple and orange ; margins crenate.

Long. 9, lat. 9, alt. 4 lin.
Hab. Uuknown. Coll. Hanley.
6.) Pectunculus cardiformis, n. sp. (Plate XXXV. figs. 6,

Shell solid, subovate, rentricose, subequilateral, equivalve, white, variously mottled with brown and purple, the markings here and there being small, close together, and of a zigzag character, especially towards the umbones, whilst nearer the centre and towards the base they form sereral irregular concentric zones or bands, the dorsal area being crossed by similur but more regular bands of a darker colour, whilst a few small triangular white spots occur amongst the brown markings; valres ornamented with between forty and fifty small prominent rounded ribs, the interstices between which, as weil as the ribs themselres, are crossed by rery fine close-set raised strix. that become somewhat scabrous towards the sides and base; cardinal area small and deep; umbones prominent, incurved anteriorly ; interior white stained with purple in front; margins strongly dentate.

Long. 17, alt. 18, lat. 11 lin.
Hab. Unknown. Coll. Hanley.
There is a second specimen in the late Mr. Taylor's collection which is iarger, and of a lighter colour, with fewer purple markings; whilst the angular white spots are larger and more numerous.

Long. 21, alt. 20, lat. $13 \frac{1}{2}$ lin. Coll. T. L. Taylor.
Externally this fine shell has very much the aspect of a Cardium. valve; white, variously clouded with bright orange patches and spots, and with two or three short flames of the same colour upon the dorsal area; valves with about twenty-five prominent, flattened, nodulous radiating ribs, both the ribs and the interstices between them being crossed by close-set, fine, raised, thread-like striæ ; cardinal area very small; umbones moderate; interior of valres white, stained with purple.

Long. 11, alt. 12, lat. 6 lin.
Hab. Eastern seas? (Belcher). Coll. Hanley.

## 8. Pectunculus taylori, n. sp. (Plate XXXV. fig. 8.)

Shell solid, orbicular, moderately convex, very slightly compressed and subangulate anteriorly; grevish white, tinged with pale fulvous in the centre, and irregularly spotted all over with dark purple short descending flames, smaller and more numerous at the upper part; valves with numerous flattened radiating ribs that become obsolete towards the sides, and sculptured all over with very fine longitudinal close-set groored lines; umbones central, moderate ; cardinal area
very small; interior blackish purple throughout, bordered with a narrow white zone; margins strongly crenate.

Long. 15, alt. 14, lat. 8 lin.
Hab. Unknown. Coll. late T. L. Taylor.
9. Petunculus orbicularis, n. sp. (Plate XXXV. fig. 9.)

Shell moderately solid, orbicular, depressed, subequilateral, equivalve, a little compressed anteriorly; white, spotted very sparingly with brown; valves with about thirty rounded radiating ribs that become less prominent towards the sides, and crossed all over with fine concentric wavy lines taking the form of overlapping scabrous laminæ towards the base; cardinal area rery small; umbones nearly approximate, interior white.

Long 12, alt. 11, lat. 4 lin.
Hab. Bass's Straits, Tasmania. Coll. Hanley.
This shell belongs to the same natural group as $P$. vitreus.
10. Pectunculus nova-guineensis, n. sp. (Plate XXXV. fig. 10.)

Shell moderately solid, quadrately orbicular, slightly convex, equilateral, equivalve; white, tinged with pale brown under the umbones; valves sculptured throughout with close-set prominent nodulous ribs, the interstices of which are crossed by extremely fine concentric striæ; dorsal margin straight, forming a sharp angle at its junction with the sides, which are flattened; ventral margin arcuate ; cardinal area very narrow; umbones small, beaks approximate; interior white; margin broadly crenate.

Long. 16, alt. 15, lat. 7 lin.
Hab. New Guinea. Coll. T. L. Taylor.
This remarkable shell belongs to the same group as $P$. vitreus and P. orbicularis.
4. On the Anatomy of the African Elephant (Elephas africanus, Blum.). By W. A. Forbes, F.Z.S., F.L.S.
[Received April 23, 1879.]
Although the African Elephant was well known, both in their wars and games, to the Romans, till within the last few years hardly any specimens of this species had been seen in Europe since the days of the Roman Empire. With but one exception, as far as I can find out, all our knowledge of the soft structures of the Proboscidea has been, till the present year, derived from examination of the Asiatic species. In his 'Mémoires pour servir à l'histoire naturelle des Animaux ' ${ }^{1}$, published in 1734 by the Académie Royale des Sciences of Paris, Claude Perrault describes an African Elephant "du Royaume de Congo," which was presented to the King of France by the King

[^19]of Portugal, and lived from 1668 to 1681 at Versailles, when it died and came into his hands for dissection ${ }^{1}$. In his memoir on this specimen (which extends over fifty pages) the anatomy of most of the soft parts is described, though, as a rule, somewhat briefly, that of the trunk, structure of the nasal organs, and female reproductive organs only being described at greater length. In the following account I shall make reference, where necessary, to Perrault's figures and descriptions under the organs described ${ }^{2}$.

Within the last fifteen years African Elephants have been imported in considerable numbers from Nubia and other parts of the UpperNile basin, viâ Egypt and Trieste into Europe ${ }^{3}$. Altogether considerably more than a hundred must have reached Europe alive ; but although some of these must surely, ere now, have fallen victims to the numerous diseases that attack animals in captivity, nothing, as far as I can learn, has been published on the auatomy of any of these animals till the current year. In the first part of the 'Archiv für Naturgeschichte' for the present year (1879), Dr. August von Mojsisovics, of Gratz, has published an article "Zur Kemntniss des afrikanischen Elephanten," ${ }^{\prime \prime}$ in which he describes certain portions only of the visceral anatomy-namely, the structure of the pharynx, particularly as regards the existence of a "pharyngeal pouch" (hereafter to be alluded to), and of the bronchi, the pancreas and pancreatic duct, and the male genital organs; and of these figures are given on three plates.

During the past winter one of the African Elephants in the possession of the Alexandra Palace Company succumbed to the severity of the weather. By the courtesy of Mr. Jones, the Secretary of the Company, the body was made over to Mr. Bartlett, and was sent up to the Society's Gardens so as to be more easily examined ${ }^{5}$. As our anatomical knowledge of this species is still so rudimentary, I make no hesitation in laying before the Society the following notes on such parts of its anatomy as I examined, the more so as the very considerable differences which occur in the various accounts of those

[^20]who have dissected the Indian species ${ }^{1}$ make it advisable to put on record any observations, however fragmentary, for the benefit of future dissectors of either of these huge animals.

The subject of these notes was a young female, which had been in the possession of the Alexandra Company only about eighteen months, but was probably four or five years old at the time of its death. I took the following measurements of the carcass :inches.
From forehead to root of tail (along back)............... 78
Length of tail, from root................................ $26 \frac{1}{2}$
Height at shoulder (measured to spines of vertebræ over body) 58
Circumference of right foot, fore.......................... 25
Circumference of right foot, hind ...................... 25
Length of ear, from front of meatus ................... 19
Greatest depth.......................................... 27
These measurements show that the ordinarily accepted rule that the height of an Elephant $=$ twice the circumference of its feet sery nearly expresses the truth.

As usual in this species, the fore limbs were provided with four, the hind with three nails.

There were eight molars in all in place. In all those of the upper jam I counted fire plates; in those of the lower, there were six in the first, and sereu in the second, tooth, of each side.

The most remarkable point obserred, when the ribs and other walls of the right side of the body had been removed, was the cnormous extent of the thoracic carity, which extended backwards above till near the sacrum, and the comparatively small part occupied by the abdominal riscera; this was, as far as I could judge, not more than about one third of the whole trunk. As is usually the case with Elephants, there was no fat risible, either in the subcutaneous tissue or in any part of the abdominal cavity.

Mouth and Tongue.-The palate, gums, and cheelis were throughout smooth, with no ridges or papille, except a few small caruncular projections near the anterior ends of the lower gums.

The tongue (fig. 1, p. 423), as in the Indian species, is small for the size of the animal, much compressed, and rather deep ${ }^{2}$. Its anterior end alone is free for about $2 \frac{1}{2}$ inches, and is bent down at an augle with the rest of the organ, and somewhat pointed. The length of the tongue in a straight line was $13 \frac{1}{2}$ inches, along the curve 15 inches. The filifcrm papillo are extremely fine and smanll, so that the tongue has an almost velvety touch. At the sides of the anterior part, ex-

[^21]tending from near the papilla of Wharton's duct towards the tip, where it becomes obsolete, is a slightly raised longitudinal line. Below this are the openings of a considerable number of small glands, situated, apparently, in the substance of the tongue itself. Above and behind this line are scattered about a fer fungiform papillæ; but these get smaller, and ultimately disappear, towards the middle line, and extend but a small distance backwards orer the sides of the tongue.

In a line with, and continued back from, this raised line, a single
Fig. 1.


Tongue of the African Elephant (reduced). W.D. Wharton's duct; M.O. Mayer's organ.
series of rather conspicuous, elevated papillæ, apparently of a glandular nature, is seen. These are continuous behind with "Mayer's organ" ", a series of vertical slit-like depressions, the larger of which are each provided with a pair of glandular papille, probably connected with mucous glands in the substance of the tongue. I counted about thirtr-three slits in this organ, which extends backwards on the sides of the tongue for $5 \frac{1}{t}$ inches, till within about an inch of the circumrallate papillw. The slits are largest and dcepest, and hare their glands proportionately larger, a little before the end oi the organ: the longest slit is $\frac{1}{2}$ inch long. In the anterior part of the organ the papillæ of the sides of the tongue stand on the ridges between the slits; but more posteriorly this arrangement disappears The circumvallate papille are situated near the back of the tongue, and nearer the middle line than the glands and papillæ just described. On the right side there are four, on the left three, with indications of a fourth. The posterior ones are considerably the larger ( $\frac{3}{8}$ inch in diameter). The tongue is rounded of and considerably narrowed behind the circumvallate papille. In the walls of the pharrnx in this region are a few irregular, raised, glaudular patches, which attain a considerable size in the middle line.

The tonsils are rather large and deep depressions. In the bottom are seen the openings of many conspicuous and rather large solitary
' So called in honour of its discorerer, Dr. C. Mnyer (if. Nor. Act. Acad. C. L. rol. xx. p. 746).
glands. The length of each tonsil is about 2 inches. Between the tonsils the root of the tongue is narrowed to about an inch, so that the fauces become extremely small. Between the two posterior pillars a few thin wrinkled folds of mucous membrane run across in front of the epiglottis, forming the "plica palato-epiglottica" of Mojsisovics ${ }^{1}$. The epiglottis is short, thick, and evenly rounded. I failed to detect any " pharyngeal pouch," such as that described by Dr. Watson ${ }^{2}$, or even to recognize the "leicht zu übersehende, seichte Grube," which Dr. Mojsisovics (l.c. p. 60) found as its sole representative in the animal he examined. In other respects my observations on the pharynx closely agree with the descriptions and figure (l.c. Taf. v. fig. 1) of the last-named naturalist, as also with the description of the pharynx by Messrs. Miall and Greenwood in the Indian species (l.c. p. 52). The former, however, does not apparently recognize the subdivision of his "inner" pharyngeal sac (l.c. Taf. v. fig. 1, I) into two by a vertical fold of mucous membrane, which runs from the transverse fold in front backwards to a level with the hinder part of the larynx, and there, after getting deeper, terminates, seuding off a fold to the laryngeal mass on one side and to the palato-pharyngeus on the other. Such an arrangement is clearly described by Messrs. Miall and Greenwood (l. c. p. 52) in their subject; but they mention only a single gland in each of the inner chambers, whereas I find that there are several glands on the outer walls only of each of the two innermost chambers of each side. The external chamber on each side is free from glands, as noticed by Dr. Mojsisorics (l.c. p. 62).

The relations of the various parts of the hyoid arches to each other, and to the muscles in connexion with them, exactly agree with those that obtain in the Indian species, as first pointed out by Prof. Garrod ${ }^{3}$. Between the digastric and the stylo-pharyngeus pass the vessels supplying the thyroid glands.

Salivary Glunds.-The parotid gland is large ${ }^{\text { }}$; Stenson's duct opens in the cheek in the usual position.

The submaxillary gland is small and oval ; it measured 2 inches long by $\frac{3}{4}$ inch deep and $\frac{1}{8}$ inch thick. Wharton's duct, 8 inches long, opens on each side on a single linear papilla beneath the tongue on the franum linguc, about 3 inches from the tip.

The sublingual is 5 inches long, 1 inch wide, and $\frac{1}{8}$ inch thick. It opens by many ducts beneath the tongue.

Besides the above glands, which are usually present in Mammalia, there is a large, more superficially situated, gland that lies in front of the angle of jaw on its inner side. This gland is much lobulated, is about 8 inches long, 1 inch wide at its greatest width, and $\frac{1}{2}$ inch thick. It opens by many ducts, some situated on raised papillæ, in the cheek ${ }^{5}$. It probably corresponds to the molar glands found in

[^22]many animals, particularly Rodents. Dr. Watson and Messrs. Miall and Greenwood only found the parotid gland present in their examples ${ }^{1}$.

Alimentary Canal.-The œsophagus is of but small calibre ; at its entrance into the stomach, when cut open and stretched out, it measures 4 inches.

The stomach in shape resembles that of the Indian Elephant as figured by Camper and others. Its long axis lies almost vertically in the animal, with the cardiac end directed upwards, the pyloric being downwards. In a straight line it measures 26 inches from the cardiac to pyloric ends; from the extremity of the cul-de-sac, along the greater curvature to the pylorus, $35 \frac{1}{2}$ inches; along the lower curvature $18 \frac{1}{2}$ inches. Its greatest depth is 9 inches, at the pylorus only $3 \frac{1}{2}$. The rounded cul-de-sac, to the left of the entrance of the œsophagus, is $9 \frac{1}{4}$ inches long by $7 \frac{3}{4}$ deep. Perrault gives $3 \frac{1}{2}$ feet by 14 inches as the dimensions of the stomach in his adult animal. In his figure of this viscus (l.c. pl. 20) the cardiac cul-de-sac is represented as nearly conical ; and in other respects his representation is not good.

The mucous membrane of the cardiac cul-de-sac is raised up into about fifteen thick zonary folds, which are arranged with considerable regularity in that part of the stomach, but decrease both in size and regularity as they approach the pyloric part ; so that the posterior third of the inner part of the stomach is almost smooth, with only slight and irregularly disposed rugæ ${ }^{2}$. The folds are very expansible; but in the ordinary state none exceeds about 1 inch in depth. The greater part are continuous all round the stomach; but others blend with adjacent folds; so that it is not possible to count the exact number with any great accuracy. The mucous membrane of the œsophagus is sharply marked off from that of the stomach : here it is covered by numerous short slit-like depressions (probably mucous canals) in the anterior two thirds; but in the posterior third these disappear or become obsolete.

About $4 \frac{1}{2}$ inches from the oesophagus, in the middle line of the lesser curvature, is a small, blunt, slightly elevated, circular prominence, pitted in the centre, of $\frac{1}{6}$ inch diameter, which is probably glandular in nature. Prof. Garrod, in his MS. notes, records small glands, apparently formed by the aggregation of several of these, as occurring in a similar position in the Indian species. The pylorus has no distinct valve.

The length of the small intestine was 27 feet 4 inches, of the very

[^23]Fig. 2.


Fiew of liver of $E$. indicis, from above.
Fig. 4.


View of liver of $E$. indicus, from below.
All the figures much reduced. Figs. 2 and 4 from drawings by Prof. Garrod.
L.L. Ieft lateral. L.C. Left central. R.C. Right central. R.L. Right lateral.
R. Right lobe of liver. V.H. Mepatic vein. V.P. Vena Porte. H.D.

Fig. 3.


View of liver of E. africcuus, from above.


Fiew of liver of $E$. africanzs, from below.
Hepatic duct. L.R. Round ligament. L.S. Suspensory ligament.
U.F. Umbilical fissure.
capacious large intestine 16 feet ${ }^{1}$. The latter was arranged on a mesocolon, jnst as in Prof. Flower's description ${ }^{2}$ of the Indian species. The cæcum was large and sacculated, forming a broad and blunt cone 22 inches long. It lay on the right side, near the middle line of the belly, pointing forwards. Prof. Flower (l.c.) found it in a similar position on the left side in a foetal African Elephant.

The mucous membrane of the duodenum is raised up into irregularly transverse, almost dendritic, closely set, slightly elevated rugæ. These continue throughout the whole length of the small intestine, but towards the ileum become arranged more longitudinally. For about 6 inches before its opening into the large intestine the ileum is surrounded internally by large, elevated, pitted glandular patches, caused by a breaking-up and intersection of the rugæ, and somewhat resembling an immensely broadened Peyer's patch. For about the last $1 \frac{1}{2}$ inch of the ileum these patches disappear, leaving the mucous membrane only slightly longitudinally wrinkled. The longest of these elevated patches is about $1 \frac{1}{2}$ inch long. The ileo-cecal valve is only represented by the prominent edges of the ileum, which project into the colon in a ring-like manner. The ileum is here, when cut up and laid flat, $4 \frac{1}{2}$ inches across. The mucous membrane of both colon and cæcum is smooth, with only slight irregular folds.

Liver.-All authors from Perrault onwards have described the Elephant's liver as being composed of two lobes. In his lectures on the organs of digestion of the Mammalia, published some years since in the 'Medical Times and Gazette,' Prof. Flower (l. c. Oct. 5, 1872, p. 372), thus describes this organ (presumably in the Indian form) :"The liver is small for the size of the animal and of simple form, being only divided by an umbilical fissure into two lobes, of which the right is the larger." But this statement does not quite acurately describe the facts of the case. As may be seen from the annexed figures (figs. 2 and 4, p. 426) taken from drawings by Prof. Garrod (who was the first to point this out to me), of the liver of Elephas indicus, the supensory ligament runs not in, but a little to the right of, the large notch which has been taken for the umbilical fissure by most authors, and is there connected, as usual, by a thin membranous expansion with the round ligament. In this species there is no umbilical notch visible ${ }^{3}$.

In Elephas africanus (figs. 3 and 5, p. 427), the suspensory ligament lies still further to the right of the large notch, and there is a conspicuous umbilical notch (about $2 \frac{1}{2}$ inches deep), visible on both surfaces of the liver.

From a comparison of the two livers it becomes clear that in both species the liver consists of three lobes, a right lobe (slightly divided

[^24]in both species), a left central lobe (extremely small in $E$. indicus, but clearly marked off in E. africanus), and a left lateral lobe, of large size in both species. In E. indicus, as may be seen from the figures, the right margin of the liver is slightly notched, apparently marking out the distinction of right central and lateral lobes : in $E$. africanus, however, there are two such notches, both very shallow and superficial. In both species there is a large area behind the transverse fissure on the under surface of the liver bare of peritoneal covering (indicated by the portion within the dotted lines in figs. $A$ and 5). The angulated line of attachment of the suspensory ligament in this species will also be noticed (fig. 3).

The liver in my specimen weighed $13 \mathrm{lb} .5 \mathrm{oz} .:$ its greatest length transversely was $20 \frac{1}{4}$ inches, the greatest breadth (from behind forwards) 16 inches. In Perrault's example it measured $3 \frac{1}{2} \mathrm{ft} . \times 2 \frac{1}{2} \mathrm{ft}$. His figure (pl. 20) is not at all like my specimen; nor is Mayer's drawing (l.c. pl. v. fig. 1-which, by the way, clearly shows the above-described relations of the suspensory ligament to the large median notch) of that of $E$. indicus very satisfactory.

As in the Indian species, there is no gall-bladder; but the hepatic duct has its epithelium reticulated at the lower end, and is very spacious, measuring 9 inches long by $1 \frac{7}{8}$ broad.
The pancreas is a lobulated, elongated gland, 17 inches long. It opens by a single, wide and short duct (one inch long) into the hepatic duct at the junction of the latter with the wall of the duodenum, through which the common duct is continued for $3 \frac{1}{2}$ inches. The common duct is provided with distinct circular valve-like folds, exactly as shown by Camper (conf. also Dr. Mojsisovics's figure, $l$. $c$. 'Taf. vi.), and opens on a slightly raised nipple-like projection on the sides of the duodenum; its aperture is about $\frac{1}{8}$ inch broad. Like Perrault and Dr. Mojsisovics, I saw nothing of any secondary pancreatic duct opening into the intestine separately from the hepato-pancreatic one, such as has been described by many naturalists (conf. Mojsisovics, l. c. pp. 72, 75) in E. indicus.

Spleen.-This viscus was of a very long irregular oval, with the attached margin nearly straight, the other somewhat irregular. It measured $23 \frac{1}{2}$ inches by $5 \frac{1}{4}$ across ${ }^{1}$ : it was flattened and thin, and of a slaty-grey colour.

Thyroid Gland.-This consists of two circular cake-like lobes of considerable consistency, united by a short isthmus. Each lobe measures about $4 \frac{1}{2}$ inches in diameter.

Heart.-The ventricles were not separated at the apex by any deep groove, such as is noticed by Mayer (l.c. p. 44) and Messrs. Miall and Greenwood (l.c. p. 68) in E. indicus. This separation of the ventricles is probably an individual feature, as neither Hunter ('Observations, 'ii. p. 172) nor Vulpian and Philipeaux (as quoted by Miall and Greenwood, l. s. c.) observed it. The fossa ovalis was very deep, admitting the first two joints of the index finger. Hunter also (l. c.) found the remains of the foramen ovale distinct. The ductus arteriosus was of the size of a quill pen, and about one inch long,

[^25]but quite impermeable. The aorta gives off an innominate artery, which is only an inch long and then divides into right brachial and right and left carotids. The left brachial is given off immediately after the innominate. This agrees with the descriptions of $E$. indicus as given by Hunter, Owen, Vulpian and Philipeaux, Watson, and Miall and Greenwood. On the other hand, Cuvier and Mayer found three trunks, namely two brachials and a common carotid. I found no "arteria thyroidea inferior simplex" coming off from the point of division of the two carotids, such as is figured by Mayer (l. c. pl. 11. fig. 3) and Watson (Journ. Anat. \& Phys. vi. pl. vi. fig. 1). The weight of the heart and great vessels, cut short and cleaned of blood, was 7 lb . There was no os cordis; and the same was the case in Perrault's specimen; nor is any such bone recorded in $\boldsymbol{E}$. indicus by recent anatomists.

Respiratory System. - The lungs were very simple in form, each lung being undivided and bluntly triancular in general outline, the left being shorter and broader. In the undistended state they measured as follows:-Right lung 23 inches long by 12 broad, left 21 inches by 14. I found no accessory lobe on the right side, such as has been observed by some anatomists in E. indicus. There is no extra bronchus.

The trachea is short, measuring about a foot in length, and not quite two inches in external diameter. It is composed of 28 rings, which are nearly complete, leaving hardly any space behind between their ends. They vary considerably in size in different parts of their circumference. The first three rings, as in E. indicus, are truncated obliquely behind, the space so formed being covered in by the body of the cricoid cartilage.

The larynx (fig. 6, p. 431) is of considerable size. The epiglottis, when covered by its soft parts, is short, thick, and rounded. The thyroid consists of two rhomboidal wings, 4 inches long, and $3 \frac{1}{4}$ deep, which are united in front superiorly for about one inch, the deep and narrow notch left between the remaining part of the wings being filled up by connective tissue. The superior cornua are short and scarcely project. The posterior are about one inch long, and are directed downwards and forwards in close proximity with the body of the thyroid cartilage, to which they are attached by connective tissue. The postero-inferior angle of the thyroid cartilage also develops an articular facet; and this is enclosed with that of the posterior cornu, in the common capsule of the crico-thyroid articulation. The cricoid (see fig. 6) is of the usual type. Its anterior part is 1 inch deep, the posterior (somewhat pentagonal) part 2 inches. The processes for articulation with the thyroid stand out in a step-like way, and are more or less clearly divided into two facets, corresponding to the double articulating surfaces of the thyroid.

The arytænoids (see fig. 6) are vertically elougated. Each measures about $2 \frac{1}{2}$ inches long by $1 \frac{1}{2}$ broad. They hare a conspicuous, vertically directed, raised spine-like process, and a large notch behind the supero-posterior angle. The cartilage of each side articulates with its fellow both above and below this notch. The processus vocalis is short and blunt. The true vocal cords are well-marked
 exist. Between the two is a slight laryngeal pouch, which extends backwards a little way, as in the Indian Elephant (Miall and Greenwood, l.c. p. 76). The muscles of the larynx closely agree with those described by the last-named anatomists. The superior

Fig. 6.


Larynx of African Elephant (about half nat. size) riewed somerthat obliquely from behind. The thyroid cartilage has been removed. $a$, points to the double facet of the crico-thyroid ariculation.
fibres of the crico-arytcnoideus posticus run transversely across in the interval left above by the more inferior, diverging fibres of that muscle.

Urino-genital System.-The kidneys lie in the usual position. Their shape is an irregular oval. The following details refer to the single kidney (right) which I preserved for further examination. The length is 10 inches, the breadth about 6 . The hilus is not marginal, but lies about 1 inch from the side; its length is $4 \frac{1}{2}$ inches. The weight of the kidney is 3 lb . The kidney is indistinctly divided into eight lobes, which are of varying size and shape; one lobe is scarcely visible on the hilar surface. These lobes are essentially distinct, each consisting of a cortical and medullary part, not, however, very clearly marked off from each other. The Malpighian corpuscles are clearly visible. Perrault's figure of the kidney (l.c. pl. 20) is too elongated and shows no lobes. The number of lobes in the kidney of $E$. indicus has been variously stated at from two to eight or nine. The suprarenal bodies resemble those of the Indian species.

The ureters open into the bladder by semilunar slits about 2 inches from its orifice. The neck of the bladder is short and thick.

The female organs are formed on precisely the same type as those of the Indian species ${ }^{1}$, consisting of a long urino-genital passage ("the common vagina, which is common to the urine and penis" of Hunter),
${ }^{1}$ Cf. Hunter, 'Observations,' 'sc. ii. p. 175; Mayer, l. c. p. 37 , t. ri. ; Owen, Anat. Vert. iii. p. 692 ; Miall and Greenirood, l. c. p. 62 . pi. iv.
a secondary vagina (" the proper, or rather uncommon, vagina, which the penis cannot enter "), a corpus uteri, with two horns, and Fallopian tubes and ovaries. The ovaries lie in pouches of peritoneum, attached by peritoneal folds to the kidneys : the one I examined resembled in form those figured by Mayer in the Indian species. It was a little over an inch long, and generally smooth, with only a few small lobular processes and erupted Graafian follicles near the line of attachment to the peritoneal pouch. The latter is continuous with the opening of the Fallopian tube, and is of considerable size: its walls are thickened by muscular fibres, prolonged into it apparently from the Fallopian tubes. The tubes are of small calibre, of the size of a crow-quill, about 3 or 4 inches long, and, after a tortuous course, open into the cornua uteri at the side of that tube, as well shown in Mayer's figure (l.c. pl. vi. fig. 2)。

The two cornua are about $\frac{1}{2}$ inch across at their commencement, and have very thick muscular and elastic walls. For the last $4 \frac{1}{2}$ inches of the course of the cornua they are united together (as seen in fig. 7) into a single tube, which is about 1 inch across at the point of junction. This tube is externally single ; but nevertheless, on cutting it across, the two comparatively small cavities of the cornua are seen lying beside one another, but separated by a considerable septum. Without any difference in the external calibre of the tube, the two cornua open together into a common cavity $2 \frac{1}{2}$ inches long, which is the true "corpus uteri." At their opening each cornu admits a large knitting-needle. There is no valve of any kind at the opening. Both cornua and corpus are lined by smooth, longitudinally plaited, mucous membrane. A similar arrangement to that here described would seem to be indicated by Perrault's de-scription:-"Ces cornes, au lieu de s'écarter et de se séparer comme elles font ordinairement, etoient jointes l'une contre l'autre, montant jusqu'au hauteur d'un pied, et n'étant séparés que par une cloison mitoyenne ; ensuite elles se séparent en deux branches." In his example (nearly or quite adult) each horn measured 2 feet 8 inches, and was $1 \frac{1}{2}$ inch across at the commencement. The female genital organs he pictures on pl. 21 : this shows the conjoined cornua, which are separate till near their end, as seen in section.

The next part of the genital organs is the dilated, sac-like, " secondary," or " uncommon," vagina. This is about $5 \frac{3}{4}$ inches long, and is lined by smooth mucous membrane, with slightly raised longitudinal folds, running from the opening into it of the corpus uteri. This opening is small, only admitting the tip of the little finger, and is provided behind with an irregularly bilobed thick valve of mucous membrane. This constriction and valve undoubtedly represent the "os uteri." Perrault describes this "secondary vagina" as the "corps orale;" in his specimen it measured 18 inches by 6 inches, and was smooth and polished within. It is well shown in his figure (l. c. pl. 21) ; but the "valvule frangée aux embouchures des cornes de la matrice" is not quite like the valve in my specimen. In the text he says, "Deux trous au dedans...étoient entourés par un appendice de la membrane interne ...en manière de la frange ou de pavillon." It would appear, then, that in his animal there was no "corpus uteri," such as that

Fig. 7.

a. Uterus and vagina of African Elephant (about half natural size), viewed from behind. The vagina (Vag.) and urino-genital canal (u.g.) have been laid open from behind. (Corn. ut.) Cornua uteri cut short above. Ut. True uterus, formed by the coalescence of the two cornua, but not marked off externally from the conjoined cornua by any constriction. o. $u$. Abore this is the valve-like structure corresponding to the Os uteri. Ur. Prominence on which the urethra opens; above it are seen the Malpighian canals; below the letters is the papilla-like free point (vide fig. 8). Ves. Bladder.
$b$. Section of the conjoined uterine cornua, half the natural size, to show the distinctness of the two tubes internally at this point.

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which exists in mine, but that the two cornua opened separately into the "corps ovale" ( = secondary vagina). Mayer apparently (l. c. pl. 6. p. 38) found a similar arrangement in E. indicus. Hunter, Owen, and Miall and Greenwood all indicate an arrangement like that which obtained in mine ${ }^{1}$.

Fig. 8.


Opening of urcthra ( $\mathbf{U}$ ) into the urino-genital canal, about natural size (somewhat diagrammatic). The walls of the urino-genital canal are cut close round the urethral eminence. M.C. Malpighian canals; below (anterior to) the letters is seen the constriction separating the vagina from the urino-genital canal; on the top of the urethral eminence is seen the small free point; below it is the cul-de-sac of the urino-genital canal.
N.B. In the natural position the lower parts of the figure are anterior, the upper parts posterior.

The secondary vagina, which lies behind the neck of the bladder, is separated by a constriction, leaving only a very small opening, from the urino-genital chamber, which is marked off by the livid blue colour of its mucous membrane from the parts already described. On each side of this median constriction lies a small obliquely-placed slit, about $\frac{1}{4}$ inch long, and admitting a probe for about the same distance into the small sacs (canals of Malpighi), of which they are the openings. Exactly the same arrangement occurs in the Indian

[^26]Elephant. There is no trace of any hymen-like organ dividing this median constriction into two, such as noticed by Miall and Greenwood (l. c. pl. iv. fig. 3, h). This point about corresponds with the entrance of the genital organs into the pelvis.

Perrault describes and figures (pl. 22) in his example two "valves sigmoildes," which guarded the "orifice interne de la matrice," and also a "rebord qui s'avançoit au-devant du col de la matrice de la longueur d'environ deux pouces." What the two sigmoid valves are I do not see, as in his figure he indicates the two Malpighian canals as well. The " rebord" probably corresponds to the tumid rounded eminence (fig. 8, p. 434) about $l$ inch long, terminating above and behind in a little point, on which the urethra opens by a somewhat narrow aperture, just below and in front of the opening into the secondary vagina ${ }^{1}$. In front of this eminence the urino-genital canal, as the remaining part of these organs may be called, is produced into a small cul-de-sac. The total length of this canal is about 20 inches $^{2}$; the clitoris, which resembles the same organ in E. indicus, and which has similar relations to the urino-genital canal, is about 15 inches from the attachment of its crura to the pelvis to its extremity. The glans clitoridis is about 2 inches long, rounded anteriorly, flattened and grooved posteriorly, where it is in contact with the urino-genital canal. There is a well-marked preputial-like reversion of the integuments round the glans, as in $E$. indicus.

The brain was removed with but little injury; but its description must be deferred till some future occasion.

As will be seen from the foregoing account, but little difference, on the whole, exists in the visceral anatomy of the only two remaining species of Proboscideans. What differences there are chiefly relate to the stomach, liver, and female organs; but, till more specimens of $E$. africanus have been dissected, it is impossible to say how many of the points above noticed are due to individual peculiarities or those of age and the like. There appears, therefore, little ground, from an anatomical point of view, to separate Loxodon as a genus from Euelephas.

[^27]5. Note on the Number of Anal Plates in Echinocidaris. By F. Jefrrey Bell, B.A., Magdalen College, Oxford, Zoological Department, British Museum, F.Z.S.
[Received April 23, 1879.]
If any one anatomical fact was thought to be certain with regard to the Echini, it was the presence, as a constant mark of differentiation, of four plates and four plates only in the anal region of the species of the genus Echinocidaris. Thus not only does the diagnosis of Desmoulins (1835) include the words " pièces terminales anales au nombre de quatre seulement," and that of Gray (1835, Arbacia) "anus valvis quatuor spiniferis tectus," but the definition given by Prof. Alex. Agassiz ${ }^{1}$ of the family Arbaciadæ states among other characters that "the anal system consists of only four large triangular plates." Prof. Troschel, in an elaborate articie on the genus ${ }^{2}$, exhibits not the slightest doubt as to the validity of this character, and expresses himself in the following words:-"Das Periproct ist durch vier dreieckige Platten geschlossen" ${ }^{3}$. In a later publication than his 'Revision' (in the Zoological Results of the Hassler Expedition ${ }^{4}$ ), Prof. Alex. Agassiz sounds the first inharmonious note. Troschel (so certain was he of the great value of these four anal plates) had, on account of the presence of five anal plates in some Parasalenia, separated them from the Echinocidaridæ, in which family, as he imagined, Agassiz had placed them. Roused, apparently, by his criticism, the American naturalist took the opportunity afforded him by the arrival of additional specimens of $\boldsymbol{E}$. dufresnii to point out " that it is quite remarkable that in the few specimens existing in the British Museum and in our collection, there should be two specimens having fire anal plates instead of the normal number of four in the other species of the genus" ${ }^{5}$. As there are two specimens in the British-Museum collection in which there are five anal plates, and as, on the other hand, the collection made by Dr. Cunningham, " of quite a number of specimens," passed, as Prof. Agassiz informs us, through his hands before the 'Revision' was published, and that without the peculiarity in question being there noticed, it would be possible to read the (not too perspicuous) sentence which I have just quoted in any one of the three following ways:-
(1) Both the specimens referred to are in the British Museum; (2) neither specimen is in the British Museum; or (3) there is, to Prof. Agassiz's knowledge, one specimen in each of the collections mentioned. I am inclined to think that this last construction is the one which the words were meant to bear ; and I am supported in this belief by the difference between the two specimens from Dr. Cun-

[^28]ningham's collection, one of which bears evident marks of having undergone examination.

It is obvious that the question could not be left in this state. It seemed now necessary to see how far the number of anal plates varied in various species, and whether the character in question had not been definitely attained to by this species only, or whether in other species also there was at times a return to the possession of the large number of plates which are so commonly found in nearly all Echinida.

With this object in view, I have examined all the specimens of the genus Echinocidaris in the Museum ; and the accompanying Table will, I think, show that the work was worth the doing. In addition to the nine specimens here noted, there is a specimen of E. pustulosa ("grandinosa") in which only three plates are present: one of these is very small; and it is also evident that two have dropped away. I have been enabled to examine some fifty-four specimens in which the anal plates are preserved; and the "number of specimens" in the following list gives the number of specimens in the set from a given locality or collection.

| Name of species. | Locality. | No. of specimens. 5 | Varieties. |  |
| :---: | :---: | :---: | :---: | :---: |
| E. dufresnii | Port Otway. |  | One with five ana | plates. |
| " | Shell Bay. | 3 | One with five | ", |
| ... | Sandy Point. | 1 | One with three | " |
| " | Otter Islands. | 1 | One with three |  |
| E. stellata | ? | 1 | One with five | " |
| E. nigra .............. | Coquimbo. | 1 | One with five | " |
| " (or sp. closely | allied)? | 10 | One with six | " |
| - (or | ? | 1 | One with ten | " |
|  | ? | 8 | One with three |  |

In the three specimens of $E$. dufresnii and the one specimen of $E$. pustulosa (juv.) received from the 'Challenger' Expedition, the number of anal plates is normal.

With regard to this Table we have to note (1) the reduction of the plates below the normal number, as obtaining in three specimens not all of the same species; (2) that the specimen of E. pustulosa (grandinosa) already referred to, and that of E. nigra from Coquimbo prevent our limiting the possession of five plates to E. dufresnii; while the specimens with six and with ten plates are most remarkable, inasmuch as in both cases there are two plates which retain the proper Echinocidarid character. No normal specimen seems yet to have been observed so young as not to have attained its four anal plates. In conclusion I think it well to abstain for the present from any speculation on the matter, and shall be satisfied if I direct the attention of echinologists to the point in question.

May 20, 1879.

Prof. W. H. Flower, LL.D., F.R.S., President, in the Chair.

Mr. Sclater made some remarks on the animals and other objects observed in the Zoological Gardens of Rotterdam, Amsterdam, Cologne, Frankfort, and Antwerp, which he had just visited.

At Rotterdam Mr. Sclater had examined with great interest an example of his recently described Plectropterus niger (P. Z. S. 1877, p. 47 , pl. vii.), being the third known individual of this peculiar species. This bird had been received from Zanzibar from Hr. H. Jansen, and so confirmed the habitat of this species as spoken of by Mr. Trimen (P.Z. S. 1879, p. 5).

At Amsterdam the series of Parrots of the genus Chrysotis lately assembled by Mr. Westerman had been studied with much interest. It contained an example of the recently described Chrysotis bodini of Finsch (P. Z. S. 1873, p. 569, pl. xlix.), being the second known specimen of this near ally of C. festiva; also two examples of the rare C. erythrura, Kuhl, the first that had ever come under Mr. Sclater's observation. At the time he wrote his 'Papageien' Dr. Finsch was not autoptically acquainted with this fine species.

Among the Antelopes in the Zoological Garden at Cologne was a fine young female of Hippotragus equinus.

In the new and excellently arranged garden at Frankfort-on-theMain Mr. Sclater had been muchinterested with the construction of the Aquarium, finished about two years ago, and now in excellent working order. The motive power used for raising the water was a gasengine. The sea-water was entirely artificial, but was very clear; and the fishes, both from the Mediterranean and North Sea, appeared to be in excellent health.

At Antwerp Mr. Sclater's attention had been principally devoted to the New Lion-house just completed. Its dimensions were slightly in excess of that of the Society, and the out-door cages and in-door cages were arranged on the same side, facing south; otherwise the principles of the two buildings were nearly similar, although the building at Antwerp was much more highly ornamented.

Prof. Owen, C.B., F.R.S., read a memoir in which an account was given of a portion of a mandible and teeth of a large extinct Kangaroo of the genus Palorchestes, recently discovered in the ancient fluviatile drift of Queensland, which was proposed to be called $P$. crassus.

This paper will be published entire in the Society's 'Transactions.'

The following papers were read:-

## 1. Descriptions of New Species of Coleoptera of the Family

 Halticidæ. By Martin Jacoby.[Received April 28, 1879.]
Genus Notozona, Clark.

1. Notozona bivittata, sp. nov.

Ovate, elongate, very convex, black; head and thorax rufous; elytra black, striate-punctate, each elytron with a longitudinal stripe from base to apex, near the lateral margins, bright flavous.

Length $3 \frac{1}{2}$ lines.
Head convex, minutely punctured, vertex smooth, labrum and antennæ davous. Thorax about three times as broad as long, sides rounded, anterior angles produced into a subacute tubercle, hinder angles obtuse; posterior margin not lobed in the middle; upper surface with a deep round forea near each side, distinctly and rather closely punctured throughout. Elytra impressed, each with eleven rows of punctures, the intervals also minutely punctured, shining black, each elytron with a flarous band from the base to the apex, running parallel with the lateral margin, and curving round with it towards the suture, near the apex. Underside (with the exception of the sides of the breast, the coxæ of the legs, and the thighs, which are flavous), black; tibiæ and tarsi black.

Hab. Peru?

## Genus Disonycha.

## 2. Disonycha erichsoni, sp. nov.

Elongate, parallel, black, shining; the last three joints of the antennæ, the abdomen, and three trausverse narrow bands across the elytra yellowish white.

Length 3 lines.
Head rather depressed, black, shining, a short elongate fovea near each ege. Antennæ longer than half the body, the second joint short, the third of double the length, the fourth longer than the third; black, with the exception of the last three joints, which are flavous testaceous. Thorax rather convex, the angles thickened, the anterior ones slightly produced outwards, an obsolete transverse depression extends near the base across the disk; latter impunctate, shining black, the angles obscure testaceous; scutellum elongate triangular, black. Elytra broader than the thorax, rather convex, narrowed near the apex, the latter rounded, surface very minutely punctured, shining black; the base, a narrow band immediately below the middle, connected with the base anteriorly and laterally, and a band near the apex yellowish-white. Underside and legs black, abdomen flavous.

Hab. Peru.
Three specimens in my collection.
3. Disonycha tristis, sp. nov.

Orate, conrex, black, opaque. Thorax testaceous, with five piceous spots; elytra black, opaque, alutaceous, with two very narrow longitudinal flavous vittæ, joined at the apex.

Length 3 lines.
Head deeply and very closely punctate, with a transverse fovea between the eyes, and a short longitudinal raised elevation towards the vertex; antennæ with the fourth joint longer than the third, elongate to the fourth joint, from there with distinctly shorter and thicker joints, black, base and underside of first three joints testaceous. Thorax rather narrow, transverse, base sinuate each side, surface finely and irregularly punctate, testaceous, four transversely placed spots near the anterior margin and another near the base piceous; scutellum opaque; elytra a little widened posteriorly, rather convex, finely alutaceous, black, without any gloss, with two very narrow longitudinal vittæ, of which one is placed near the sutural, the other near the lateral margin, and which are joined near the apex, of a flavous testaceous colour. Below and legs black, also opaque.

Hab. Brazil.
This species may be distinguished from others similarly marked by the coarse punctuation of the head, the opaque colour of the elytra, and the very narrow vittæ of the latter.

## Genus Nephrica, Harold.

## 4. Nephrica marginata, sp. nov.

Elongate-orate ; black, very shining. Head, thorax, and lateral margins of the elytra, as well as the apex of latter, light testaceous.

Length $3 \frac{3}{4}-4$ lines.
Head impunctate, eyes moderately deep, emarginate, kidueyshaped; base of labrum and the palpi dark piceous; antennæ robust, third and fourth joints equal, the two basal joints stained below with flarous, the rest black. Thorax narrow, its sides broadly margined, the anterior angles convex, obtusely rounded outwards, basal margin rather deeply concave at either side, surface irregularly depressed, with a short oblique groove near the posterior angles ; disk almost impunctate, with a row of deeper punctures running parallel with the lateral margins. Scutellum smooth, broad, apex rounded; elytra rather depressed below the base, distinctly margined and very minutely punctate, of a very shining deep black colour, the entire lateral margins narrowly, as well as the apex more widely, light testaceous-coloured. Underside and legs black, claws not swollen.

Hab. Peru.
Two specimens in my collection.
Genus Номорнета, Erichs.
5. H. variabilis (aquatorialis, Harold?).

Elongate, subparallel, black, above flavous; elytra with the lateral
margins, an oblique transverse band before, another more horizontal band behind the middle, fuscous or ferruginous.

Length $4 \frac{1}{2}$ lines.
$\boldsymbol{V} a r$. a. The anterior transverse band of the elytra curved in form of a crescent.

Var.b. The dark colour of the elytra predominating, so as to surround three flavous patches on each elytron.

Var. c. Elytra fuscous, with eight flavous spots.
Var. $d$. Elytra fuscous, with two large flavous patches.
Head smooth, impunctate, with a large flavous patch in front, as well as two small spots below the antennæ of the same colonr. Antennæ robust, black ; all the joints, with the exception of the second one, which is very small, subequal. Thorax transversely convex, laterally narrowly marginate; the anterior angles not toothed, but acutely produced almost to the end of the eyes, their apex much thickened ; surface extremely finely punctate, almost smooth ; scutellum small, piceous; elytra also nearly impunctate, slightly narrowed at the base, shining flavous; the suture, to a greater or smaller extent, the external margin, the base more or less, and two transverse bands (one oblique before the middle, the second behind) fuscous.

In var. $a$ the anterior band does not touch the suture, but curves down and outwards, so as to form a crescent. In the other varieties the dark colour predominates in one case to an extent so as to surround four flavous patches on each elytron, in another variety leaving only two large flavous spots, of which one is situated in the middle near the lateral margin, the other near the apex. Underside and legs black or dark brown, covered with yellowish pubescence; claw-joint moderately thickened.

Hab. Venezuela, Columbia, Brazil; var. d, Mexico.
This species bears a close resemblance to H. 8-guttata, Fab. ; but the larger size, the colour of the transverse bands, and the absence of the small shoulder-spot will distinguish it from that species. It is also known in collections, I believe, under the MS. name of insolita, Chev. ; 6-signata, Dej.

## 6. Номорheta albofasciata, sp. nov.

Ovate, elongate, black, shining ; a frontal patch, two spots below the antennæ, thorax and abdomen flavous testaceous or reddish brown. Elytra metallic violaceous blue or black; a slightly curved transverse band across the middle, and a transverse subquadrate patch near the apex of each elytron, white.

## Length 3 lines.

Head bluish black, vertex impunctate, shining, a row of rather deep punctures round the orbit of the eyes, a transverse spot between the latter testaceous; antennæ rather short, black, base of the second joint testaceous. Thorax with the lateral margins slightly sinuate, the anterior angles produced and thickened, and the posterior margin distinctly and obliquely sinuate at each side ; surface impunctate; scutellum black, smooth; elytra convex, mar-
ginate, impunctate, black or violaceous blue ; a transverse band from the margin to the suture, situated at the middle, slightly convex anteriorly, and narrowed towards the suture, and a transverse subquadrate patch, widened towards the suture, white. Underside black, abdomen flavous; claws scarcely thickened.

Hab. Cache, Costa Rica. Collected by Mr. Rogers.

## Genus Asphera, Chev.

## 7. Asphera apicalis, sp. not.

Ovate, convex, black; clypeus and sides of thorax testaceous. Elytra purplish, the extreme lateral margins and the apex more or less flavous testaceous.

Length 3-4 lines.
Head with a few rather deep punctures, deeply transversely depressed, with a short longitudinal groove between the eyes, the space in front of the latter rather swollen. Clypeus light testaceous. Antennæ rather long, the fourth and fifth joints the longest, of equal length, the basal three joints piceous, the rest black. Thorax narrowed from base to apex, its sides broadly margined, anterior angles acute, but not produced ; surface impunctate, black, the sides light testaceous; scutellum black, broadly triangular. Elytra closely and irregularly punctured, the interstices transversely and longitudinally wrinkled, to a less extent towards the apex, of a purplish colour; the apex with a triangular space extending to a greater or smaller degree upwards, as well as the extreme lateral margins, flavous testaceous. Underside and legs black. Metatarsus as long as the two following joints, claw-joint moderately swollen.

Hab. Brazil.

## 8. Asphera balyi, sp. nov.

Light fulvous below; head and elytra dark metallic green, shining ; thorax and two spots on each elytron testaceous.

Length $3 \frac{1}{2}$ lines.
Head with a deep transverse depression, impunctate, lower face testaceous; antennæ piceous, basal three joints testaceous. Thorax with the anterior angles not mucronate, but obtusely rounded, sides regularly rounded and broadly flattened, base with an obsoletely depressed transverse narrow groove, posterior margin sinuate at each side, surface very minutely punctured; elytra narrowly margined, throughout finely punctured, very shining dark metallic green, the extreme lateral margin, a transversely placed oval-shaped spot in the middle, and a smaller one of the same shape near the apex light testaceous. Underside fuscous or ferruginous; knees and the tibiæ piceous. Metatarsus as long as the two following joints united, claw-joint moderately swollen.

Hab. Peru.

## 9. Asphera amazonica, sp. nov.

Elongate, subparallel, light flavous; antennæ and legs fulvous;
elytra with a large semitriangular patch at the base, and another from the middle to nearly the apex, of a brownish purplish colour.

Length $2 \frac{1}{2}$ lines.
Vertex of head smooth, impunctate, limited in front by four transversely placed deep punctures, and from the clypeus by several deep indentations; apex of jaws black; antennæ robust, all the joints, except the second, of equal length, slightly diminishing, however, towards the apex, of a uniformly fulvous colour, and closely pubescent. Thorax transversely subquadrate, the sides nearly parallel and narrowly thickened, but not depressed; anterior angles convex, but not produced outwards; surface impunctate, shining, of a very light testaceous colour; scutellum fulvous; elytra rather convex, distinctly margined, very minutely punctate, of the same colour as the thorax; each elytron with a large patch at the base, rounded anteriorly, and not touching either the margin or the suture, and another one triangularly shaped, the point directed towards the apex, of a reddish-brown colour, with a very distinct purplish gloss. Taking these patches as the ground-colour, they would be limited by the suture (widened anteriorly), a narrow band across the middle, and by the lateral margins of a light flavous colour. Underside testaceous, legs flavous, claw-joint not swollen. Metatarsus as long as the two following joints united.
Hab. Amazon. In my collection.
This species is closely allied to $A$. nobilitata, Fabr.; but the want of the transverse band on the thorax, together with the different shape of the latter, as well as the shape of the patches on the elytra, will distinguish it from that species.
10. Asphera pallida, sp. nov.

Broadly ovate, black; apex of abdomen and the thorax more or less fulvous; elytra pale testaceous, shining, impunctate.

Length $4 \frac{1}{2}$ lines.
Head shining black, impunctate, with the usual transverse depressiou; antennæ of half the length of the body, uniformly black, covered thickly with whitish hairs. Thorax comparatively wide, about twice as broad as long, its sides erenly rounded, narrowly margined, but each side rather indistinctly limited by the more convex disk, the anterior angles very acute and distinctly produced in form of a short tooth, basal margin very slightly sinuate at each side, almost straight. Surface scarcely visibly punctate, of a lighter or darker flavous colour; scutellum shining black; elytra slightly wider at the base than the thorax, widened till behind the middle, from there rounded to the apex, distinctly margined, smooth and shining, of a light testaceous colour, more or less stained obsoletely with fuscous in some specimens. Underside and legs shining black, the latter closely pubescent; apex of abdomen fulvous. Posterior thighs very moderately thickened; metatarsus longer than the following joints, the claw simple, not thickened.

Hab. Costa Rica. Collected by Mr. Rogers.

## Genus Edionychis, Erichs.

## 11. Edionychis quadrifasciata, sp. nov.

Broadly ovate, black, above testaceous; a transverse band on the disk of the thoras, and four others across the elytra, metallic violaceous blue.

Length 4 lines.
Head impunctate, deeply transversely impressed between the eyes, shining, piceous, lower part of face flavous, apex of labrum piceous; antennæ black, the first three joints flavous, stained with piceous above, the first joint elongate, the third and fourth joints subequal. Thorax very narrow, about four times as broad as long, its sides broadly margined and evenly rounded; anterior angles outwardly produced, their apex rounded, basal margin sinuate on either side, disk impunctate or scarcely visibly punctured, flavous testaceous; a black narrow band, not touching either side, extends transversely across the disk; scutellum black, smooth, broad, its sides rounded and its apex obtuse. Elytra narrowed at the base and towards the apex, finely but distinctly and moderately closely punctured, of a testaceous colour ; a transverse hand at the base, one immediately before, another behind the middle, as well as a fourth band near the apex, metallic violaceous or greenish blue; none of these bands extend quite to the lateral margins; and the intervals between them are of about half the width of the bands themselves. Underside and legs black, the margins of the abdominal segments obscure flavous; posterior thighs very thickened; the first joint of the tarsi shorter than the two following ones united; the claw-joint very swollen.

Hab. Peru. In my collection.

## 12. Edionychis fusconotata, sp. nov.

Ovate, widened behind, obscure piceous below, above flavous testaceous ; each elytron with two small spots at the base, a transverse larger one in the middle, and another near the apex, fuscous.

Length 2 lines.
Head distinctly punctured, with a strongly-marked transverse groove; antennæ with joints three and four of equal length, the first five joints flavous, the rest piceous-coloured; anterior angles of the thorax toothed, the posterior margin nearly straight, surface impunctate, testaceous; elytra narrowed at the base, rather flattened, more convex behind the middle, distinctly punctured, the interstices slightly wrinkled, of a flavous or testaceous colour, each elytron with four fuscous spots, of which one (the smallest) is placed at the humeral callus, another (larger one) near the scutellum, a more trans-versely-shaped one at the middle, slightly hollowed out at its posterior margin, and the fourth (generally the largest) also transversely placed at a little distance from the apex. Underside obscure piceous, the four anterior legs entirely flavous.

Hab. Rio Janeiro.
13. Edionychis transversalis, sp. nov.

Orate, flarous-testaceous; a transverse subquadrate band at the
base of the elytra, connected by a longitudinal lateral stripe with another band across the middle, black.

Length 3 lines.
Head impunctate, with only a few punctures round the eyes, and the usual transverse groove; antennæ entirely pale testaceous. Thorax with the sides broadly flattened, and the anterior angles produced into a short tooth, surface impunctate; scutellum testaceous; elytra rather convex, distinctly margined, minutely punctured throughout, of the same colour as the thorax, with a transverse subquadrate black band at the base, the posterior margin of which is obliquely eut, and including a small spot of the ground-colour ; a narrow lateral stripe connects this band with another fascia placed at the middle of each elytron, which has the inner margin slightly hollowed out, and is in some specimens almost connected along the suture with the basal band. The prosternum is distinctly raised in shape of a ridge, and, like the entire underside and the legs, of a pale testaceous colour.

Hab. Nicaragua. Collected by Mr. Janson.

## 14. Edionychis insularis, sp. nov.

Ovate, convex ; obscure ferruginous below ; antennæ, tibiæ, and the two pairs of anterior legs black. Thorax and elytra pale testaceous, the latter with two spots below the middle and the apex violaceous black.

Length 3 lines.
Head with several deep punctures near the eyes, and a wellmarked transverse groove between the antennæ; lower half of the face testaceous, the vertex and the labrum and palpi blackish piceous with a greenish gloss; antennæ black, their two basal joints testaceous below. Thorax of the usual shape, with the anterior angles produced in form of a short tooth directed outwards; surface impunctate, pale testaceous; scutellum black; elytra widened behind, rather convex, distinctly punctate, the punctuations diminishing in depth towards the apex, but strongly marked in two longitudinal rows below the humeral callus, of the same colour as the thorax, an irregularly shaped small roundish spot below the middle, and a still smaller one at the extreme apex of each elytron, of a violaceous black colour.

Hab. Mexico.
Approaching in colour and markings E. bipunctata, Chev.; but this species has no apical spot on the elytra, and the legs and breast are black.

## 15. Edionychis nicaraguensis, sp. nov.

Ovate, convex, dark ferruginous below; head, thorax, and elytra flavous-testaceous; the base and shoulder of each elytron, two spots below the base, and two transverse fasciæ behind the middle dark ferruginous.

Length 3-4 lines.
Head with several deep punctures on the vertex, and a cruciform
depression ; antennæ and lower part of face obscure ferruginous, the third joint of former not much longer than the second, the fourth joint the longest. Thorax with the anterior angles but slightly produced and rounded; surface finely punctured, shining testaceous or flavous. Elytra widened behind, rather deeply and very closely punctured, with a distinct longitudinal depression in the middle of the base; the latter narrowly ferruginous, which colour also extends in form of a longitudinal short streak down the shoulders to about one third the length of the elytra; another sutural semisquare spot is placed below the scutellum, while a transverse short fascia occupies the middle, and another similar-shaped spot is placed near the apex of each elytron. Neither of these markings touch the suture or the lateral margins. Claw-joint strongly inflated.

Hab. Irazu Mountain, Costa Rica, and Nicaragua.

## 16. Edionychis seftemmaculata, sp. nov.

Piceous below; lower part of vertex, thorax, and elytra testaceous, the latter with seven black patches, viz, two at the base, one common to both elytra before the middle, the other four at the middle and before the apex respectively.

Length 3 lines.
Vertex impunctate, lower part of the latter, as well as that of the clypeus, testaceous; antennæ piceous, basal joints paler. Thorax rather convex, sides broadly margined, the anterior angles produced into a short tooth; surface minutely punctured, testaceous; scutellum obscure piceous: elytra narrowed at base and apex, broadly margined, with two short longitudinal depressions at their posterior half, more distinctly punctured than the thorax, of a light testaceous colour, with the patches of the following shape-the basal one obliquely cut at its posterior margin, the sutural one of triangular shape, followed closely by a transverse quadrate fascia, and the apical one also of a transversely subquadrate shape; none of these markings touch the sutural or the lateral margins. Claw-joint greatly dilated.

Hab. Peru.
2. On a Fourth Collection of Birds made by the Rev. G. Brown, C.M.Z.S., on Duke-of-York Island and in its vicinity. By P. L. Sclater, M.A., Ph.D., F.R.S., Secretary to the Society.
[Received May 2, 1879.]
(Plates XXXVI., XXXVII.)
I have now again the pleasure of laying before the Society a series of bird-skins collected by our excellent correspondent Mr. Brown on Duke-of-York Island and on the adjacent parts of New Britain and New Ireland. Though many of these specimens belong to species


O


1 MYZOMELA CINERACEA.
2.DONACICOLA SPECTABILIS
3.MUNIA FORBESI.
$\omega$
represented in the former collections ${ }^{1}$, there are several novel and interesting birds in the present consignment, to which I wish to draw special attention, and which show that the avifauna of this district is by no means yet completely known to us.

The total number of skins in the present Collection, including some just previously received in a letter, is 59 , belonging to 41 species. Every skin being labelled with an exact date and locality, it will be advisable to give a complete list of the species.
*1. Graucalus sclateri, Salvad

* 2. rark

2. Graucalus sublineatus, sp. nov.
3. Dicrurus lemostictus, Scl.

* 4. Pachycephala melanura, Gould
* 5. Myzomela sclateri, Forbes.
* 6. Myzomela cincracea, sp. nov.
* 7. Myzomela erythrina, Ramsay

8. Philemon cockerelli, Scl.

* 9. Donacicola spectabilis, sp. nov.
*10. Munia forbesi, sp. nov.

11. Dendrochelidon mystacea (Less.)
*12. Collocalia, sp. inc.
*13. Caprimulgus macrurus
*14. Eurysiopodus sp. inc. (pullus)
12. 

*15. Alcyone pusilla (Temm.) .................. Wood Harbour, New Ireland.
16. Halcyon sanctus, Vig. and Horsf. ......... Duke-of-York group.
*17. Scythrops nove-hollandice ...... ........... Duke-of-York group.
18. Cacomantis sp. inc. (jr.)..................... Duke-of-York group.
*19. Chrysococcyx lucidus (Gm.) ............... New Ireland.
20. Lorius hypenochrous, Gray ............... New Britain.
21. Trichoglossus massene, Bp. ............... New Ireland.
22. Ninox variegata (Q. et G.) ............... Topaia, New Ireland.
*23. Ninox jacquinoti, Bp......................... New Britain.
*24. Henicopernis longicauda (Garn.) ......... New Britain.
25. Baza reinwardti (Müll. et Scl.) ......... New Ireland.
*26. Falco lunulatus, Lath. ..................... Duke-of-York group.
*27. Astur torquatus (Temm.) ................... New Ireland.
28. Astur etorques (Salvad.)..................... New Britain.
29. Carpophaga van-wycki, Cassin ............ Duke-of-York group.
30. Edirhinus insolitus (Schl.) ............... Duke-of-York group.
31. Phlogcenas johannce, Sclater ............... Duke-of-York group.
32. Macropygia carteretia, Bp.................. New Britain and Duke-of-York group.
33. Macropygia nigrirostris, Salvad.

Dike-of-York group.
*34. Excalfactoria chinensis (Linn.)
*35. Amaurornis moluccana (Wallace)
Duke-o York group.
36. Charadrius fulvus (Gm.) .................. Makado, Duke-of-York group.
37. Agialitis dubia (Scop.).................... Topaia, New Ireland.
38. Numenius uropygialis, Gould ............ Dnke-of-York group.
39. Totanus incanus (Gm.) ..................... Duke-of-York group.
40. Tringoides hypoleucus (Linn.) ............ Duke-of-York group.
41. Sterna fuliginosa (Gm.)...................... Duke-of-York group.

* The species thus marked have not been represented in Mr. Brown's former collections.

1. Graucalus sclateri, Salvad.; Sharpe, Cat. iv. p. 40.

A female of this species, differing from the type (now in the Bremen Museum), which is doubtless a male, in its ashy grey lores ${ }^{1}$ See P. Z. S. 1877, p. 96, 1878, p. 289, and 1878, p. 670.
and front. In the typical specimen the lores and front are quite black. In other respects the two skins do not materially differ, regard being had to the fact that the type was formerly preserved in spirit.
2. Graucalus sublineatus, sp. nov. (Plate XXXVI.)

Cinereus; remigibus et rectricibus nigris, illis extus cum tectricibus majoribus anguste albo marginatis; abdomine albo regulariter transfasciato; subalaribus albis cinereo transfasciatis; remigum pagina inferiore albicante ; rostro et pedilus nigris. Long. tota 9 , alce $5 \cdot 4$, caudae $4 \cdot 3$.
Hab. Noтa Hibernia (Brown).
Obs. Sp. forma et statura G. lineati et ejusdem coloris, sed loris vix nigricantibus et fasciis abdominis diversa.

Of this apparently new species of Graucalus, one specimen, marked male, is in the collection, obtained in the district of Topaia, New Ireland, in September 1878. The irides are described as "yellow;" and the bird is said to be also met with in New Britain.
4. Pachycephala melanura, Gould, B. Austr. ii. pl. 61.

From Palikuüru Island (' a small island in midchannel between New Britain and Duke-of-York Island '") Mr. Brown sends five examples of a Pachycephala which I do not venture to separate from P. melanura of North Australia. Two adult males agree closely with a skin of $P$. melanura from Cape York in the collection of Messrs. Salvin and Godman, except in having the outer edgings of the secondaries rather more greyish. Of three examples marked "female," all have the abdomen yellow and back olive, and one has brown-chestnut margins to the secondaries and wing-coverts. It is possible these may be really young males, as the female of the CapeYork bird (in Mus. S.-G.) is of a much paler and more uniform colour, with only a wash of yellowish below on the breast and crissum.

Mr. Brown in his MS. noted this species as "abundant" in Palakuüru, and "eyes and legs black" in both sexes.

I do not know Pachycephala citreogaster (!), Ramsay, P. L. S. N. S. W. i. p. 67, described from a spirit-specimen from New Britain, unless it be referable to another stage of plumage of this species.
5. Myzomela sclateri, Forbes, anteà, p. 275, Pl. XXV. fig. 2.

Mr. Brown now sends a pair of this fine new Myzomela, Mr. Forbes's type of which was received in a letter from the same correspondent. Like the type, they were obtained on the island of Palakuïru in June 1878. The female may be diagnosed as follows:-

Supra saturate olivacea; pileo, alis et cauda nigricantibus, his extus olivaceo limbatis; subtus grisescenti-flavida, gula coccineo vix tincta.
6. Myzomela cineracea, sp. nov. (Plate XXXVII. fig. 1.)

Saturate cineracea unicolor; subalaribus et remigum marginibus
internis albis; rostro et pedibus nigris. Long. tota 5.5 , ala $2 \cdot 8$, cauda $2 \cdot 4$, tarsi 0.8 , rostri a rictu (lin. dir.) $1 \cdot 05$.
Hab. Nova Britannia (Brown).
A single male example of this apparently distinct Myzomela was obtained by Mr. Brown in New Britain in May 1878. The species may be placed best, I think, in Mr. Forbes's section A. $\beta$. $a$ (antec̀, p. 268), following M. nigrita and M. pammelana.
7. Myzomela erythrina, Ramsay, Pr. L. S. N. S. W. ii. p. 107 (?).

A single specimen of a Myzomela, obtained in New Ireland in September 1878 , appears to agree best in dimensions with $M$. coccinea of Ramsay, though in colouring perhaps rather coinciding with M. erythrina, described in the same paper. Mr. Ramsay himself confesses his doubts as to whether these supposed species are really different; but I will adopt the latter name, as the locality coincides.

Prof. Salvadori has been kind enough to compare this specimen with his example of M. cruentata, Meyer ${ }^{1}$, of New Guinea, with which Mr. Forbes (anteì, p. 280) thought Mr. Ramsay's species might prove identical. But Prof. Salvadori tells me the present bird is "positively different" from M. cruentata, being a " larger bird with a stouter bill, and of a very different red."
9. Donacicola ${ }^{2}$ spectabilis, sp. nov. (Plate XXXVII. fig. 2.)

Brunnea; pileo, nucha et capitis lateribus nigris; tectricibus cauda superioribus et rectricum mediarum marginibus pallide castaneis; subtus alba; gula, ventre imo et crisso cum femoribus nigris; subalaribus ochraceo-albis; rostro et pedibus nigris. Long. tota $3 \cdot 4$, alae $1 \cdot 8$, caudae $1 \cdot 2$.
Hab. Nova Britannia (Brown).
This Finch, of which there is a single skin in the present collection, is perhaps not very far from Donacola flaviprymna, Gould, B. Austr. iii. pl. 96, but is immediately recognizable by its black head and neck.

## 10. Munia forbest, sp. nov. (Plate XXXVII. fig. 3.)

Testaceo-rufa, subtus paulo dilutior; capite undique cum gula, hypochondriis et ventre imo cum femoribus et cauda tectricibus productis nigris; rostro et pedibus nigris. Long. tota 4, ala 2 , caude acuminatea $1^{\circ} 5$; rostro crassiusculo.
Hab. Nova Hibernia (Brown).
A single example of this Finch, obtained in the Topaia district of New Ireland in September 1878, is in the collection. It is a rather thick-billed species, belonging to the group of $M$. malacca. I propose to name it in compliment to Mr. W. A. Forbes, F.Z.S., who has paid much attention to the Ploceidæ, and will, I hope, some day give us a monograph of them.

[^29]Proc. Zool. Soc.-1879, No. XXIX.
15. Alcyone pusilla (Temm.) ; Gould, B. Austr. ii. pl. xxvi.; Sharpe, Kingf. p. 53, pl. xvi.

A single specimen of this bird "from Wood Harbour, at the north end of New Ireland" is rather larger than North-Australian skins in the British Museum with which I have compared it, and has the blue flanks connected by an imperfect breast-band. The latter, however, is a somewhat variable character.

## 22. Ninox variegata.

Noctua variegata, Q. et G. Voy. de l'Astr. Zool. i. p. 166 et Atlas, pl. i. fig. 2.

Athene variegata, Scl. P. Z.S. 1869, p. 123 et 1878 , p. 290.
Ninox solomonis, Sharpe, P.Z. S. 1876, p. 673, pl. lxii.
Ninox novce-britannic, Ramsay, Pr. L. S. N. S. W. ii. p. 105.
One specimen, marked female, from the Topaia district of New Ireland and obtained in 1878, agrees with the individual from the Solomon Islands, which I have compared with the type in the Paris Museum. N. novce-britannia is, no doubt, identical.
23. Ninox jacquinoti.

Chevêche rayée, Hombr. et Jacq. Voy. au Pôle Sud, Atl. pl. iii. fig. 1.

Athene jacquinoti, Bp. Consp. i. p. 42 (1850).
Athene taniata, Jacq. et Puch. Voy. au Pôle Sud, Zool. iii. p. 50 (1853).

Ninox teniata, Sharpe, Cat. Birds, ii. p. 186.
A single female specimen, obtained in New Britain in May 1878, I refer somewhat doubtfully to this species. The upper surface is rather spotted than barred; and there are some irregular shaft-stripes and edgings on the white abdomen. I shall take an early opportunity of comparing this specimen with the type at Paris*.

## 24. Henicopernis longicauda.

Mr. Gurney, who has kindly examined this specimen, states that although Mr. Sharpe agrees with him in believing it to be $H$. longicauda in immature dress, they have neither of them seen an example previously in similar plumage.
25. Baza reinwardti.

Mr . Gurney has kindly sent me the following note on this specimen :-
"The Baza probably does not differ specifically from $\boldsymbol{B}$.reinwardti; but on comparing it with seven adults from other localities (ranging from New Guinea northwards), I find that it differs from them all in having the brown colour on the back somewhat less extended, and in the transverse bars on the under surface being a pure grey without admixture of brown, or with scarcely any, instead of having a decided brown tint as in all the others.
"Mr. E. P. Ramsay has sent me a copy of an article on the Zoology of New Guinea, in which he speaks of the New Ireland race

[^30]


of this bird as differing from New-Guinea specimens in the markings of the wings and tail; but, judging from the series at the British Museum, I do not think that these are constant characters."
29. Carpophaga yan-wycki.

Of this and the other Pigeons of Duke-of-York Island, Mr. Brown writes as follows :-
"Of your new Carpophaga melanochroa I have only obtained one skin. C. vanwycki and C. rubricera are our commonest Pigeons, and can be got in any numbers. If you wish for any specimens I can easily get them, as we are shooting them every day. Edirhinus insolitus is also very abundant; I have tried several times to rear some for transmission to you, but have not yet succeeded in keeping them for more than a few months.
35. Amaurornis moluccana (Wallace).

Porzana moluccana, Wallace, P. Z. S. 1865, p. 480.
Gallinula ruficrissa, Gould, B. Aust. Suppl. pl. 79.
Amaurornis moluccana, Salvadori, R. Accad. Sci. di Torino, vol. xiv.
I have not been able to make a comparison; but I suppose that the Duke-of-York bird is referable to this southern form of $A$. olivacea (Meyen) of the Philippines,
> 3. Notes on the Anatomy of Gelada rueppelli. By A. H. Garrod, F.R.S., Prosector to the Society,

[Received May 7, 1879.]

## (Plate XXXVIII.)

Having had the opportunity of dissecting the adults of both the sexes of Gelada rueppelli, the female of which lived a short time in the Society's Gardens, where it died, I desire to record some points in the anatomy of the species which appear to be of interest.

The following are measurements from the skins, except when otherwise indicated:-

|  | ठt adult. | 오 adult. |
| :---: | :---: | :---: |
|  | inches. | inches. |
| From margin of upper lip, over head and along back, to base of tail... | 28.75 | $29 \cdot 2$ |
| Same measurements from body with skin removed... | $24 \cdot 5$ | 25 |
| Tail, without hairy tuft | 24.75 | 25 |
| Tuft of tail | 8 | $3 \cdot 5$ |
| From wrist to end of nail of middle digit of hand. | 5 | 4.5 |
| From heel to end of nail of middle digit of foot... | 7 | 6.25 |
| From angle of axilla to end of nail of middle digit of hand | 16.5 | $10 \times 1$ |
| From mid-perineum to end of nail of middle digit of foot | 9 |  |
| Nail of middle digit of hand along convexity . | $1 \cdot 1$ | $1 \cdot 15$ |
| Nail of middle digit of foot along convexity .......... | 1.01 | 1.01 |

With reference to the male, its general colour is a dark sooty chocolate-brown. The shoulder, forearin, back of hand, and instep, as well as most of the tail, with the exception of its end, are black. The palest brown is found on the abdomen, though this is very dark. A few white hairs mixed with the brown-black of the tailtuft give that a lightish tint. The longest hair is that between the shoulders, where it reaches as much as eleven inches. This lengthy hair extends upwards over the occiput quite forward to the superciliary ridge, and downwards to the loins, below which it rapidly reduces before the base of the tail is reached. Laterally the long hair extends over the shoulders, and less considerably under the arms, towards the lateral margins and to the surface below the nude chest-space. The hair on the abdomen is about $2 \cdot 75$ inches long, that outside the thighs 4 inches, that on the tail an inch, except the end tuft, where it reaches 3.5 inches.

The characteristic nude chest-space is double in the male, being formed of two median triangular isosceles areas reversely directed, with their apices approximate, but separated by an interval, 1.5 inch in length, of hair-covered skin. The base of the very obtuseangled upper triangle, which is margined by black hair, is five and a half inches from the middle of the lower lip, and is situated opposite the larynx, its length being $3 \cdot 75$ inches, and its depth not being more than an inch. The lower triangle is also very obtuse-angled, with its base, slightly concave downwards, six inches long.

Although the two nude triangles above described do not meet, they tend to form an hour-glass surface of florid skin, $7 \cdot 75$ inches along each lateral curve from horn to horn. The hair bordering it is an inch long or so and iron-grey in tint, from the almost equal admixture of black and white hairs. There is no carunculation of the skin in the nude spaces or at their borders. The pair of nipples are closely approximate, not being more than a quarter of an inch apart in the dried skin. They are situated in the nude area of the lower triangle, an inch above its base.

In the female the general tint is much the same as that of the male; the hair is very much shorter and less faded at the tips. The interscapular hair is the longest, reaching nearly four inches, whilst that of the loins is not so black as in the male.

The pectoral nude space is in the female carunculated all along its lateral and inferior borders. The two triangles which go to form it join apically by an isthmus $1 \cdot 3$ inch broad. The marginal hair is not mixed with white. The caruncles are numerous, and about a quarter of an inch in breadth, being ovate and flattened. The nipples are situated as in the male, and are an inch apart:

In both sexes the face is nude below the line of the frontal eminences, aud laterally from points a little less than half an inch outside the outer canthus of each eye, the nude spaces running straight downwards in the direction of the angles of the mouth, just before reaching which they turn and include the chin.

The ischial callosities, which are subcircular, and a little less than two inches in diameter. are situated in a naked area which is carun-
culated in the female. This area extends forwards for three and a quarter inches, broad opposite the mons veneris, which is therefore nude, the anterior border being non-carunculated, and gradually lost in the sparse hair of the abdomen.

Osteological comparisons between Gelada and its allies are very attractive, but do not lead to very definite results. Those most important in my estimation will be here recorded.

The following are measurements of the larger bones in the male:-

$$
\begin{aligned}
& \text { Length of humerus. inches. } \\
& \text {," radius. . . . . . . . . . . . . . . . . . . . . . . . . } \quad 7 \cdot 1 \\
& \text { " ulna ....................... } 8 \cdot 35 \\
& \text { ", femur...................... } 7 \cdot 45 \\
& \text { ", tibia ........ ............ } \quad 7 \cdot 6 \\
& \text { " fibula ..................... } 7 \cdot 0 \\
& \text { " scapula ...................... } 525 \text { (extreme) }
\end{aligned}
$$

There are 13 pairs of ribs, of which 5 are false. The sacrum consists of three vertebre. The clavicles form a single curve; and the anterior margin of the manubrium sterni is not much thickened.

My opportunities for examining the skulls of adult specimens of Monkeys being but few, it is impossible to generalize to any extent with safety. Cercopithecus differs from Macacus and Cynocephalus in not possessing a fifth lobe to its mandibular third molar. In Gelada this extra lobe is large, as is the anterior talon on the maxillary molars, which are small in Cynocephalus, and much smaller still in the Macaques I have examined. In Gelada the upper incisors are at right angles to the alveolar margins of the premaxillary, which is the case in Macacus ; in Cynocephalus and Cercopithecus they converge as they descend.

The profile view of the Gelada's skull exhibits the great anterior development of the sharp median portion of the supraorbital ridge and the deep concavity of the nasal contour. In Gelada, Cercopithecus, and Cynocephalus the nasal bones are separate, elongate, and narrow, appearing superficially upon the skull as high as the supraorbital frontal ridge. In Macacus they fuse, and form a short broad triangle whose apex does not reach the frontal bone, the maxillaries meeting above it.

In Gelada there is no trace of any groove or foramen for the supraorbital vessels and nerve. This is also the case in Cercopithecus. In Macacus and Cynocephalus, however, the groove is very deep, almost forming a foramen. The malar foramen is also wanting in Gelada. Its presence in allied genera is uncertain. There is a foramen in the fronto-malar suture.

In Macacus and Cynocephalus the anterior palatine foramina open into an osseous depression, which is continued for some distance fowards, almost to the alveolar margin. In Gelada they open directly upon the surface of the palate.

In Macacus and in Cercopithecus a powerful transverse ridge of bone is seen to form the posterior boundary of the osseous palate. This is not seen in Gelada or in Cynocephalus.

In Cynocephalus the mastoid process of the temporal bone is fairly developed. In Gelada, Cercopithecus, and Macacus it is obsolete.

In Cynocephalus and MIacacus the hamular process of the internal pterygoid plate of the sphenoid bone is much more superficial, and is placed more forward than in Gelada.

The left lung is two-lobed, the lower being slightly the larger. The upper is nearly divided transversely into two moieties, of which the lower is a little the smaller.

The right lung has four lobes, the (bifid) azygos being the smallest, the middle next in size, elongate and triangular. The obliquely cut upper lobe is smaller than the subquadrate largest lower lobe.

There are three circumvallate papillæ at the base of the tongue, arranged in the characteristic $V$.

The following are intestinal mcasurements:-

|  | Male. inches. | Female inches. |
| :---: | :---: | :---: |
| Small intestine | 90 | 129 |
| Large intestine | 58 | 51 |
| Cæcum | 3 | 3 |

The stomach nuch resembles that of man in shape, being a little more elongate. There is no appendix vermiformis to the sacculated cecum, which does not differ from that of the lower Old-World Monkeys. The colon is sacculated throughout.

The spleen is three inches loug, one and a half inch broad, being suboblong and slightly bifid at one extremity.

The kidneys are ovate, not reniform, and with but a single pyramid in each.

There is an os penis three quarters of an inch long. The vagina is very hirsute, with large broad transverse rugæ. The uterus is pyriform.

To understand the bearing of the details of the anatomy of the liver of the Gelada, it will be necessary to view the peculiarities of the organ in allied genera. This the inspection of a large number of species enables me to do.

In the genus Macacus the liver is comparatively uncomplicated. The right and left lateral fissures are well marked, the umbilical fissure being less considerable and less constant in depth. The abdominal surfaces of the right and left central lobes are frequently
connected by a bridge of hepatic tissue. The inferior margin of the right central lobe is straight, and at right angles to the axis of the gall-bladder, which latter organ is deeply imbedded in a cystic fossa, never deep enough to appear on the diaphragmatic surface. The fundus of the gall-bladder never reaches the inferior margin of the organ, though it approaches very near to it. There is no trace of a cystic fissure. The interval between the inner border of the cystic fossa and the umbilical fissure is always broad, a quadrate lobule intervening. The left central is generally the smallest of the four main lobes, it being vertically elongate. The left lateral lobe is shaped much like the sector of a quarter of a circle, with the apes directed to the portal fissure. This apex is often simple; but when not so a slight fissure runs for a short distance from the superior border of the lobe, not far from the apex, parallel to the left lateral fissure. The right lateral lobe is subquadrate in form ; its surface presents no irregularities, as a rule; but when present they take the form of deep semilunar incisions on its abdominal surface. The abdominal margins of the unbilical fissure frequently present smali lobelets of a bluntly conical form, with their apices directed downwards. These are most frequently situated on the left central lobe, but sometimes on the right, sometimes on both. The caudate lobe is elongatedly subfusiform, without any renal depression; its apex reaches as far as the extreme right margin of the right lateral lobe. The Spigelian lobe is well marked, being small and thin; its shape is that of the tip of the compressed finger of a glove ; it is directed backwards.

The genus Cercopithecus differs from Macacus in the following respects:-The inferior margin of the right central lobe is rarely anything approaching a straight line at right angles to the axis of the gall-bladder; a slight notch often also indicates the rudiment of a cystic fissure. The imbedded fundus of the gall-bladder is likewise generally visible on the diaphragmatic surface of the right central lobe. The interval between the left margin of the cystic fossa and the umbilical fissure is narrow, and often not more than a sharp vertical ridge of hepatic tissue. The apex of the left lateral lobe (directed, as in Macacus, towards the portal fissure), when complicated, is rendered so by a short fissure running from the superior border of the lobe, not parallel to the left lateral fissure, but downwards and inwards, so as to produce a subtriangular lobelet, in which the free margin is directed horizontally upwards. When complicated the right lateral lobe develops lobules on its abdominal surface, not semilunar incisions. The caudate lobe runs to the extreme margin of the right lateral lobe, as in Macacus. The Spigelian lobe is frequently absent, and when present is irregular and much smaller than in Macacus.

In the genus Cynocephalus the peculiarities of Cercopithecus are observed, except that the caudate lobe is very short, only extending half across the right lateral lobe horizontally. The Spigelian lobe is also well developed, quite as much or eren more so than in Macacus, it being thicker than in that genus.

In Gelada the right and left central lobes are proportionally larger than in the genera above described. Otherwise it most resembles Cercopithecus, differing from it in that the cystic fissure is shallow, at the same time that the fundus of the gall-bladder does not so nearly approach the inferior border of the right central lobe. It resembles Cercopithecus in that the Spigelian lobe is absent, at the same time that the caudate lobe is long, in both which respects it contrasts strongly with Cynocephalus. The only lobelet is one on the right border of the umbilical fissure, which is Macaque-like. It differs from Macacus in the obliquity of the inferior border of the right central lobe, and in the nearness of the gall-bladder to the umbilical fissure, as well as in the absence of a Spigelian lobe and the large size of the central lobes.

The brain of Gelada rueppelli is particularly instructive when compared with the beautiful series of figures in Gratiolet's 'Mémoire sur les Plis Cérébraux de l'Homme et des Primatès.' Its different aspects are represented, natural size, on Plate XXXVIII. Its most marked feature is the relatively small size of the occipital lobe, which is about as large as in the Semnopitheci, smaller than in the Cynocephati, and much smaller than in Macacus as well as Cercopithecus. In the two last-named genera this lobe is unconvoluted, or very slightly so. In Gelada there is a simple horizontal sulcus ( $h, h$ ) a short distance above its lower border, running from the posterior surface some way forward, but not so far as to meet the posterior transverse sulcus ( $c, c$ ). In Cynocephalus the occipital lobe is more elaborately convoluted.

An inferior horizontal occipital sulcus, parallel to that just described, runs so far forward as to join the major oblique temporoparietal sulcus ( $b, b$ ). This is a condition recorded by Gratiolet in Semnopithecus maurus only, the sulcus generally turning upwards to end independently.

The major oblique temporo-parietal sulcus ( $b, b$ ) commences below, near the inferior rounded margin of the temporal lobe, and runs upwards as well as backwards to near the middle line of the brain. It is joined by the prolongation upwards of the Sylvian fissure ( $a, a$ ), two thirds from its lower end, it being bent slightly forward at the point of junction.

Surrounding the upper end of this last sulcus, but not meeting it, is one whose posterior limb ( $c, c$ ) forms the anterior boundary of the occipital lobe, the posterior transverse fissure, whilst its anterior limb $(g, g)$ runs forwards, downwards, and outwards, to end independently as in allied Pimates. Where these two limbs meet a snall sulcus runs inwards to the middle line, becoming conspicuous on the median aspect of the hemisphere.

The prolongation upwards and backwards of the Sylvian fissure on the outer surface of the brain meets the major oblique temporoparietal sulcus as above mentioned. Whether or not it should meet it is uncertain in allied species of the same genus according to Gratiolet. It is peculiar, however, in that from a little above and below its middle it sends forward small branches $(e, e$ and $n, n)$. In
the Cynocephali alone is any thing of this kind seen, and in them the lower of these two sulci only ( $n, n$ ).

The anterior transverse (parietal) fissure ( $d, d$ ) commences externally between the two small sulci just described ( $e, e$ and $n, n$ ). After running forward and upward it bends, turning slightly backwards to the middle line, where it is continued downwards upon the median surface of the hemisphere for a short distance, as in no species described by Gratiolet.

The three-way convolution of the frontal lobe ( $f f f$ ) resembles that in the Cynocephali-the Semnopitheci, Macaci, and Cercopitheci almost or entirely lacking its posterior limb, which is well represented in the Geladas and Baboons.

Small independent sulci are more numerous than in Macacus and Cercopithecus-about as many as in the Cynocephali, with which the Gelada most agrees in size.

Correlation of the facts above recorded makes me place Gelada along with Cercopithecus and Cynocephalus away from Macacus. Its affinities with Cercopithecus seem to me more intimate than with Cynocephalus, to which genus it most certainly does not belong.

## EXPLANATION OF PLATE XXXVIII.

Brain of Gelada rueppelli, natural size.
Fig. 1. Right hemisphere, outer aspect.

| 2. | inner aspect. |  |
| :--- | :--- | :--- |
| 3. | $"$ | superior aspect. |
| 4. | " | inferior aspect. |

4. Notes on and Description of the Female of Ceriornis blythii, Jerdon. By Lieut.-Col. H. H. GodwinAusten, F.Z.S.
[Received May 15, 1879.]
(Plate XXXIX.)
I have much pleasure in exhibiting the female of the rare Ceriornis blythii, which up to the present time was unknown ${ }^{1}$. For the acquisition of this bird, and our further knowledge of the species, I am indebted to Capt. W. Brydon, of the 42 nd Assam Light Infantry, who obtained several of this species in the Aughami Naga hills. He tried very hard to bring two of them to England alive,

[^31]but without success; one, which he brought safely down to Calcutta and embarked on board ship, died from accidental exposure to seawater after leaving Colombo. The history of the first discovery of this bird was given by Dr. Jerdon in the 'Proceedings of the Asiatic Society of Bengal,' 1870, p. 59 ; and he then very appropriately named it after one who had laboured so long and so ably at Indian ornithology.

Curious to say, the first bird ever obtained from the natives was brought to England alive, together with the still very rare and then new species, Lophophorus sclateri, and both were finally deposited in the Society's Gardens, where they lived a short time. The only other specimen I know of the latter bird was also obtained by Capt. Brydon at Saddya, and is now in the Indian Museum, Calcutta.

A full account of both species, by Mr. P. L. Sclater, is to be found in the P. Z. S. for 1870, p. 162, with figures drawn by Mr. Keulemans.

In Elliot's 'Monograph of the Phasianidæ,' a splendid drawing is given of the male of C. blythii, unfortunately represented sitting on a pine tree ; no pines, however, are to be found in that portion of the Burrail range occupied by this bird, although Pinus lihasiana comes in at a lower altitude in the more open country further east and west.

## Ceriornis blythir 9 . (Plate XXXIX.)

Ceriornis blythii, Jerdon, P. A. S. B. 18j0, p. 60.
ㅇ (by dissection, Brydon). Head above black, with ear-coverts and a broadish line down the side of the upper neck of the same colour ; above the eyes a dark orange-red line commences, and extends back beyond the occiput. The back is uniformly and finely mottled with umber-black and ochre, some of the feathers on the upper margin having two small terminal chestnut spots, with a minute white central and terminal ocellus between them. This spotting disappears towards the upper tail-coverts, which are tipped with rusty brown. The tail is irregularly barred with mottled ochre and black. Chin and throat whitish, each feather narrowly margined black. The nape and upper breast of a rich orange-chestnut colour, somewhat duller than in the male, followed posteriorly by plumage of a pale umber ground, more or less finely mottled with the umber-black, which increases on the flanks, while some of the feathers have terminal ashy spots margined black, and white-shafted. These feathers on the abdomen merge into featbers dark-tipped as seen against the paler hue of that part. The thighs are narrowly barred dull black and ochre, a few of the thigh-coverts tipped dull white. The wing is more richly mottled with ruddy ochre and black, the former colour merging into siennabrown on the indistinct barring of the primaries. No spurs.

Dimensions: wing $9 \cdot 75$, tail $6 \cdot 5$, tarsus 3.5 inches; of a male in my possession, which was the second specimen obtained, the wing is 10.9 inches.

In my 4th List of Birds from N.E. Frontier (J. A. S. B. 1874,
p. 172), the true habitat of this species is recorded, viz. the Burrail range, at from 6000 to 10,000 feet.

The following extracts from a letter written by Lieut. Macgregor, of the 44th Sylhet Light Infantry, on the habits of Ceriornis are very interesting; and I cannot do better than give the observations in his own words :-"This bird inhabits the high ranges of the Naga hills; it is found at altitudes ranging from 9000 to 5000 feet, most frequently on the Burrail range, near Khonomah. The Nagas say that it does not migrate, but in the winter months it descends from the higher ranges down to 5000 feet. This is the season that specimens of the bird are generally obtained. The modus operandi is as follows:-Nooses are placed in the paths that the birds are known to frequent, and a large number of men are employed as beaters: they drive the birds before them slowly and quietly up to the traps (if they made too much noise probably the birds would take to flight). The specimens that I have now in my possession eat worms and a kind of red berry. One that I had last year in the Naga hills used to eat dhan (unhusked rice). Out of three that were brought away from the hills only one arrived alive in Calcutta; but this was in the hot weather. The young female has a plumage very like that of a hen Floriken (Sypheotides bengalensis); when it gets older it assumes a plumage more like the cock, becoming red on the throat and on the back. The cry of the birds is like the sound 'ank' repeated several times. The Nagas give the bird the name of 'Née.' The Nagas say that the Argus lays three eggs; but as this was in answer to a leading question, I cannot vouch for it."

As Polyplectron chinquis and two species of Ceriornis are mentioned in a paper by Mr. Sclater read before this Society a short time ago, as laying only two eggs, it is very probable that the Naga information is accurate; for these people have a wonderful knowledge of all the beasts and birds and of their habits. In such forests, and exposed to so much danger from many formidable enemies, the parent birds can seldom rear more than two at a time : they are driven to roost in the low trees in comparative safety; and in such a position the hen conld only take one chick under each wing. A greater number of eggs could be only a waste of life, and would, if hatched out, only encumber the mother, and possibly lead to her own destruction ; for it must be remembered that in dense forests, cats and other small predatory mammals have the great advantage of being able to stalk their prey, and approach unseen to within a yard or two.

## June 3, 1879 .

Prof. Flower, LL.D., F.R.S., President, in the Chair.
The Secretary laid upon the table two volumes of original drawings of the birds of India, which had been deposited in the Society's Library by Brigadier-General Andrew Cooke M‘Master.

The two volumes contained about 270 figures of the birds of the Iudian Peninsula, mostly named and arranged after Jerdon's ' Birds of India,' and would be of great use in determining Indian birds.

The drawings were stated to have been mostly made by soldiers in General M'Master's house at Secunderabad, under his superintendence; but some had been executed by the native artists of 'Southern India at Trichinopoly and Bangalore.

Mr. C. L. Jackson, F.Z.S., exhibited the skull of the female Sealion (Otaria stelleri?) which was lately living in the Southport Aquarium, and which had been killed by the male suddenly jumping from the rock and striking against her.

Mr. Sclater laid before the meeting a small collection of birds lately furwarded to him by Dr. Adolf Döring, Professor of Chemistry in the University of Cordova in the Argentine Republic, and made the following remarks on them:-
(1) Lophospingus pusillus (Burm.) ; Cab. Journ. f. Orn. 1878, p. 195.

I quite agree with Dr. Cabanis that the proper situation for this bird is not with Gubernatrix, as placed by Burmeister, but I rather question whether it ought not to be in the same genus as Coryphospingus griseo-cristatus (Lafr. et d'Orb.).
(2) Tenioptera murina (Lafr. et d'Orb.) ; Scl. P. Z. S. 1872, p. 541 ; Cab. l. c. p. 196.

Agrees with Mr. Hudson's skins from the Rio Negro of Patagonia.
(3) Cnipolegus cinereus, Scl. P. Z. S. 1870, p. 58; Cab. l. c. p. 197.

A female of this interesting species, of which I described the male from a single skin in the collection of the Smithsonian Institution.
(4) Habrura minima (Gould); Cab. et Heine, Mus. Hein. ii. p. 53 .

Hapalura minima, Cab. J. f. O. 1878, p. 197.
This is the first example I have ever been able to procure of this scarce and delicate little Tyramine bird.
(5) Furnarius tricolor, Düring; Cab. J. f. O. 1878, p. 196. This little species, which is quite new to me, is even rather smaller than $F$. minor, Pelzeln, and quite different in colour.
(6) Synallaxis orbignii (Reichenb.); Scl. P. Z. S. 1874, p. 22.

Dr. Döring's skin is marked " $S$. fugax, sp. nov.," but agrees well with one in my collection (ex Mendoza, S. crassirostris, Landbeck) which I refer to S. orbignii (Reichenb.).
( $/$ ) Synallaxis sclateri, Döring; Cab. J.f. O. 1878, p. 196.
This species, which Dr. Döring has done me the honour to call after me, is certainly very nearly allied to my $S$. hudsoni (P. Z. S. 1874, p. 25), and may be the same. Unfortunately I have mislaid the typical specimen of $\boldsymbol{S}$. hudsoni, and cannot make the necessary comparison. There is a faint tinge of yellow on the throat of $\mathcal{S}$. sclateri; this was certainly well marked in my S. hudsoni.
(8) Phacellodomus sibilatrix, Döring, MS.

I have already a Bolivian example of this species in my collection, but had confounded it with P. frontalis, as likewise Lafresnaye and D'Orbigny seem to have done. It appears distinguishable from $\boldsymbol{P}$. frontalis by the rufous colour on the bend of the wing.
(9) Nothoprocta doeringi, Cab. J. f. Orn. 1878, p. 198.

This species is closely allied to N. pentlondi (Gray), of Bolivia, and to $N$.punctulata (Gray), of Chili. Specimens of all three species are in the Paris Museum.

The following papers were read :-

1. A Description of the Vessels of the Neck and Head in the Ground-Hornbill (Bucorvus abyssinicus). By W.Otrley, F.R.C.S., Demonstrator of Anatomy at Univ. Coll. Lond.
[Received May 17, 1879.]

In a paper read before this Society in 1876 (see P. Z. S. 1876, p. 60 ), Mr. Garrod drew attention to a peculiarity in the vessels of the neck of the Ground-Hornbill, and pointed out that the carotid arteries, instead of being found in their usual place in the middle of the neck and in the hypapophysial canal, were replaced by two vessels which accompanied the pneumogastric nerves as far as the head. This peculiarity had not been observed in any other bird, the nearest approach to it being found in some Parrots, where such a vessel is found on one side of the neck, while the carotid artery of the other has its normal position. Though at first inclined to suppose that these aberrant arteries were really carotids, Mr. Garrod felt some doubt on the point,
and was kind enough to give me an injected specimen, the arteries of which are described in this paper, in order to determine the question.

The results of this examination show that, besides the possible varieties in the arteries of the neck enumerated by Barkow in his admirable paper in Meckel's 'Archiv' for 1829, there is a further variety which he had not calculated upon.

Meckel classifies these possible varieties in the following manner :-

1. Both common carotids may run up the side of the neck. (Not yet observed.)
2. One common carotid may be in the middle line and one on the side of the neck.
a. The left superficial.
b. The right superficial. (Not yet found.)
3. Both may be in the middle line.
a. The left covering the right. (Usual.)
b. The right covering the left.
4. They may unite in the middle line and divide again above.
a. Both equal in size. (As in the Common Bittern.)
b. Left may be smaller. (As in Phonicopterus, observed by Garrod.)
c. Right may be smaller. (As in Cacatua sulphurea, observed by Meckel.)
The variety which is met with in Bucorvus, however, is of a different nature. Here there are two superficial arteries accompanying the pneumogastric nerves, and they end above by anastomosing with the vertebral arteries. But they are not carotid arteries ; for there remain two fine cords, the obliterated common carotids, which are attached below to the vertebral arteries, and which run inwards to the middle line and continue up the neck in the hypapophysial canal, covered over by fascia, but in no place by a bony arch. Opposite the body of the fourth cervical vertebra both these fine cords leave the canal, and, bending outwards beneath the œesophagus, end by joining the vertebral arteries again very soon after these have turned forwards, when they hare escaped from their bony canal, and just beyond the point where the internal carotid arteries are given off.

The superficial arteries are then the enlarged representatives of the anastomosing ascending and descending cervical arteries, which usually are branches of the common carotid and superior thyroid arteries respectively; and their relatively large size is to be accounted for by the obliteration of the common carotids.

As a result of this arrangement of the vessels of the neck, the origin of the arteries for the supply of the head differs from that usually met with ; and the second drawing shows the course of these vessels, which hardly differed from one another on the two sides, except as regards the size of one or two of the trunks.

## Description of the Vessels.

The innominate arteries are given off from the aorta as usual ; and after a short course upwards, across the bronchi, both arteries break
up into numerous branches, which closely resemble one another on the two sides. In the plan (fig. 1) certain vessels are drawn on one side, others on the other, for the sake of greater distinctness.
The first branch given off, P , is the large artery to the pectoralis primus, from which comes off an internal mammary, IM., and

Fig. 1.


Plan of the innominate arteries and their branches.
another small vessel to the sternum. Opposite the same point the innominate gives off a branch X , which supplies the gland lying on the vertebral artery and anastomoses in its substance with a branch
from the comes nervi vagi, 2, and which also furnishes several branches to the syrinx and its muscles. And, lastly, the innominate divides into subclavian and vertebral. From the former, S, only one branch, the acromial thoracic, at, is seen to spring, before the artery escapes from the thorax. The latter, V, soon sends a branch downwards, D, which runs with the recurrent laryngeal nerve, and ends by supplying the bronchus, the lung-substance, and the œsophagus. The next branch, 2, is the comes nervi vagi, which runs up the neck with the ragus nerve, and ends by anastomosing with the vertebral. In its course it supplies:- $(a)$ a branch to the thyroid gland, $G l ;(b)$ a series of vessels forwards to the oesophagus, where they form loops and supply several branches to the trachea as well as to the skin; (c) near the head a small offset to the internal pterygoid muscle. After this the vertebral gives off a suprascapular artery, $S s$, and a superior intercostal (which from its lying behind the vertebral cannot be represented) to the upper three spaces; and between these two and the branch 2 a white thin cord springs from the inside of the vertebral, and, crossing, inwards beneath the comes nervi vagi, gets beneath the œsophagus to the hypapophysial canal. Here it is joined by its companion of the opposite side ; and these cords run up the neck side by side till near the fourth cervical vertebra, when they bend outwards, get from beneath the pharyns, and end by joining the vertebral trunk (as seen in the second plan of vessels), just after this artery has sent off that branch which furnishes the internal carotid.

It thus appears that the two true carotids are obliterated, while their duty is performed by a superficial vessel on each side, which, accompanying the vagus as it does, might be called the comes nervi vagi, though by its position in the neck this vessel rather resembles the true carotid of Mammalia. These vessels did not differ much in size ; the right was somewhat larger ; but the vertebrals were almost precisely symmetrical.

As a result of this change in the vascular supply of the neck, the arrangement of the vessels in the upper part of the neck and in the head was a good deal modified. In the place of an anastomosis between the vertebral and an occipital branch of the carotid, the vertebral, which is large, turns forward and completes an arch with the superficial comes nervi vagi, whose concavity is joined by the obliterated carotid, while its convexity furnishes the branches for the head.

The following is a short description of their course and distribution (vide fig. 2, p. 465). After the vertebral artery has turned forwards out of the canal in the cervical transverse processes, its first branch (18) is distributed to the muscles attached to the back of the head. Another small branch (11) is given downwards to reach the digastric and internal pterygoid. A large vessel (10) then comes off, which soon enters a bony canal behind the tympanum (the limits of which are marked by the transverse lines in the plan), and divides into two ( 20,21 ); the upper vessel (20) turns behind the fenestra ovalis (F O), and, then emerging from its canal, furnishes a large offset to the orbital plexus;
it is continued through this plexus and divides almost immediately into two branches ( 14,15 ), both of which supply the contents of the orbit, and eventually anastomose with the ethmoidal artery; 14 runs near the roof of the orbit, 15 under the optic nerve. The orbital plexus (17) furnishes two small branches (12, 13) to the eyelids and the muscles of the eye, a vessel (16) which runs in front of the quadrate bone, and ends in the muscles attached to the mandible, and a descending branch ( $8^{\prime}$ ), the course of which will be presently described.

Fig. 2.


Plan of the arteries for the supply of the head and neck. Right side.
The vessel 21 is the internal carotid; opposite the mark 2 a large offset is sent to the maxillary plexus (M.Pl.), which is joined on its way by a communication from the internal maxillary artery (7). After giving off this large branch the internal carotid continues its tortuous course through a special bony canal till it reaches the interior of the cranium. A small nerve (a branch of the facial) crosses the internal carotid artery on its outer side where the communicating offset leaves that vessel.

The next branch of the vertebral is the internal maxillary (7), a large vessel which runs above the internal pterygoid muscle. Its first branch (9) ends in muscular offsets.

The next (8) emerges from behind the triangular tendon of the external pterygoid, is joined by a communication from the orbital

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plexus ( $8^{\prime}$ ), and, accompanying the inferior dental nerve, ends in the mandible. After this the internal maxillary artery breaks up into the maxillary plexus, which furnishes many branches to the internal pterygoid and to the muscle which depresses the upper jaw. The plexus is joined by a branch from the palatine artery (5), and furnishes a large offset (19), which is partly distributed to the olfactory mucous membrane, partly (23) ends by anastomosing with the common trunk formed by the union of the palatine arteries.

The next branch of the vertebral (6) is a small vessel which supplies the internal pterygoid, and, turning across the spine behind the pharynx, ends by joining its fellow of the opposite side.

The next (5), the palatine artery, furnishes branches to the internal pterygoid, and runs along the lower surface of that muscle. In front it meets and joins its fellow, the left being considerably the larger. The common trunk thus formed is joined by an offset from each maxillary plexus, and soon breaks up into larger branches; it is distributed to the lower surface and the interior of the beak.

The last branch of the vertebral, before it joins the comes nervi vagi, is the lingual artery (3). This supplies the inuscles above the hyoid bone, and the mucous membrane of the mouth; it joins its fellow at the symphysis, and ends in the substance of the mandible.

The obliterated carotid (car) is seen joining the vertebral, close to the origin of the branch 10 .

After the internal carotid (21) has given off its branch to the maxillary plexus, itruns along its canal to enter the skull on the side of the sella turcica (vide fig. 3, p. 467) ; it at once sends a branch backwards (25), which probably anastomoses with that of the other side. This vessel, the only representative of a basilar artery; runs backwards in a groove on the upper surface of the basisphenoid, supplying the medulla; the artery on the right side is considerably larger than that on the left. The next large branches are distributed on the outer surface of the optic lobes and the hemispheres; and finally the artery divides into the middle cerebral (28) and the ethmoidal (26). The latter soon enters the orbit, where it has been already described as anastomosing with branches 14 and 15 . It helps to supply the olfactory mucous membrane, and gives offsets to the bony expansion on the top of the head and the skin in front of the eye (29).

The principal differences between the arteries of the head in Bucorvus and those of birds generally are therefore:-1st, the absence of any considerable superior thyroid artery; this vessel is replaced by branches from the comes nervi vagi. 2nd, the absence of any artery which could be called focial. Its place is taken by branches from the maxillary plexus and from the ophthalmic artery. It may be added that Barkow calls that artery facial which, following Bauer's description, I have named internal maxillary; also that the artery which Barkow names ethmoidal $\mathrm{O}_{\text {wen }}$ calls ophthalmic, and Bauer internal ophthalmic. In this case, and in the names given to all the other branches to the head, I have used those which were originally employed by Barkow.

I hate not attempted to suggest ony theory to account for the
singular fact that in this bird, and in this bird alone, so far as is at present known, such a remarkable event should occur as the complete obliteration of the principal vessels for the supply of the head.

The presence of two quite distinct vestiges of the missing arteries, in the shape of the two fine cords, which have been already described, would seem to indicate that this obliteration must have occurred after the arteries in question had been fully formed and for some

Fig. 3.


Plan of the internal carotid and its branches, with the arteries in the orbit (enlarged). Right side.
time in use. The manner in which the obliterated cord joins the vertebral artery above suggests that the vessel from which the internal carotid springs was originally a direct continuation of the common carotid trunk. And the alteration that would be necessitated by the obliteration of the main artery would be simple. The vessel which extends from 10 to the vertebral canal would then have been the occipital, which normally should anastomose with the vertebral in this position, while the part from 10 to 2 would be the external carotid, giving the usual branches. It seems probable therefore that at some time in the history of this bird the distribution of its vessels differed but little from that usually met with; but this fact perhaps adds to the difficulty of accounting for the change that has taken place. The theories hitherto proposed to account for such obliterations of the vessels of the neck in birds have only dealt with a change affecting one side of the body. This is the only instance which I am acquainted with of the symmetrical closure of two such important arteries at a period which, if I am correct in my supposition, was subsequent to their full development and functional activity.

# 2. On the Specifrc Identity of the British Martens. By Edward R. Alston, F.L.S., F.Z.S., \&c. 

[Received May 20, 1879.]
Two European species of Martens have been generally recognized by naturalists since the days of Albertus Magnus and Agricola, although some writers, including Linnæus himself, regarded them as identical. It is only of late years, however, that their specific distinctness has been finally proved; and before considering the question of the identity of the British Martens, it will be well to point out the true synonymy and diagnostic characters of the species in question, concerning which some confusion still appears to exist.

Several systematic writers, especially in Germany and America, have assigned the Linnæan title Mustela to the Martens instead of to the more truly typical Weasels, on the ground that this had been done by Cuvier. But the names Putorius and Mustela were only employed by the great French zoologist to mark sous-genres, and were not used binomially to indicate distinct genera ${ }^{1}$. The first definite separation was made three years later by Nilsson, who gave the generic title of Martes to the present group ${ }^{2}$; and thus both priority and propriety sanction the restriction of the name Mustela to the true Weasels and Ermines. There has also been some difference of opinion as to the specific name which should properly be given to the Mustela martes of Linnæus. Many writers have employed abietum, apparently on the ground that it was used as a varietal name by Linnæus himself. This, however, is not the case: the varieties abietum and fayorum were not accepted by him; he merely says that such a distinction was recognized by the peasants ${ }^{3}$. Moreover, if abietum be used, the universally known name of foina for the allied species would have to be withdrawn in favour of fagorum. The earliest equivalent to Mustela martes appears undoubtedly to be Nilsson's Martes sylvatica; and the synonymy of the two species should therefore stand thus:-

## I. Martes sylvatica.

Mrustela martes, Linnæus, Syst. Nat. (12th ed.), i. p. 67 (1766).
Martes sylvatica, Nilsson, Faun. Skand. (1st. ed.) i. p. 41 (1820).
—_vulgaris, Griffith, Curier's An. Kingd. v. p. 123 (1827).
——abietum, Fleming, Brit. Animals, p. 14, ex Ray (1828). - sylvestris, Nilsson, Faun. Skand. (2d ed.) i. p. 171, ex Gesner (1847).
${ }^{1}$ 'Règne Animal' (1 $1^{\text {re }}$ éd., 1817), i. pp. 147, 199.
${ }^{2}$ Skand. Fauna (1st ed. 1820), i. p. 41. The genus Martes has been quoted by Lilljeborg and some others as instituted by "G. Cuvier, 1797;" this error appears to have originated in a misunderstanding of the Freuch plural Martes in the 'Tableau Elementaire.'
${ }^{3}$ "Varietas duplex rusticis: Fagorum gutture albo ; Abietum gutture flavo." Syst. Nat. (12th ed.) i. p. 67.
II. Martes foina.

Mustela foina, Erxleben, Syst. Reg. An. p. 458 (1777) ${ }^{1}$.
Martes foina, Nilsson, Faun. Skand. (1st ed.) i. p. 38 (1820).
——fagorum, Fleming, Brit. Animals, p. 14, ex Ray (1828).
The cranial and dental characters by which Martes sylvatica and M. foina may be recognized were first pointed out by Dr. R. Hensel in $1853^{2}$, further elaborated by Blasius in $1857^{3}$, and recently revised by Dr. Elliott Coues in comparison with their American congeners ${ }^{4}$. At various times I have carefully compared the descriptions of these writers with a great number of skulls; and although many of the distinctions which they have pointed out are merely comparative, and though some of them prove to be inconstant when a large series of specimens are examined, yet I have never found the slightest difficulty in separating the species by the following external and internal characters:-

Martes sylvatica. Outer fur rich dark brown, under-fur reddish grey, with clear reddish-yellow tips; breast-spot usually yellow, varying from bright orange to pale cream-colour or yellowish white. Breadth of the skull (see fig. 2, p. 471) across the zygomatic arches rather more than half the length; the arches highest posteriorly, whence they slope rather suddenly downwards and forwards. Sides of muzzle nearly parallel; anterior opening of nares oval ; postorbital process about equidistant between the frontal constriction and the anterior root of the zygoma. Palate comparatively narrow, with a distinct azygos process on its posterior margin. Upper premolars placed regularly in the line of the series; the fourth as long as the upper molar is broad, its inner cusp large and placed nearly at right angles to the axis of the tooth. Upper molar broader than long, its flattened inner portion considerably longer and larger than the outer part; in the latter the external tubercle fills the space between the anterior and posterior tubercles, so that the external outline of the tooth is simply convex, not emarginated. First lower molar with a slightly developed inner tubercle at the base of the main cusp.

Martes foina. Outer fur dull greyish brown, under-fur greyish white; breast-spotsmaller than in M.sylvatica, pure white. Breadth of the skull (see fig. 1, p. 470) across the zygomatic arches much more than half the length; the arches regularly curved, broadest and highest near their middle. Sides of muzzle slightly converging; anterior opening of nares broader than in II. sylvatica, heart-shaped; postorbital process nearer to the frontal constriction than to the anterior root of the zygoma. Palate comparatively broad, truncated posteriorly. Upper premolars crowded, and often placed diagonally, their anterior extremities being directed inwards; the fourth considerably longer than
${ }^{1}$ Dr. Elliott Coues, in his 'Fur-bearing Auimals' (p. 77) gives M. foina as instituted by "White, Phil. Trans. lxiv. 1774, 196", having seemingly been misled by some reference to Gilbert White's celebrated Monograph of the House-
${ }_{2}^{2}$ Arch. f. Naturg. xix. i. pp. $17-22$, pl. ii.
${ }_{4}^{3}$ Säugeth. Deutschi., pp. 211-219.
${ }^{4}$ Fur-bearing Animals, pp. $74-80$, pls. iii., iv.
the upper molar is broad; its inner cusp smaller, and placed more diagonally than in M. sylvatica. Upper molar subquadrate, its flattened inner portion hardly longer or larger than the outer part, in which the external and anterior tubercles are placed close together, the external outline of the tooth being distinctly emarginated between them and the posterior tubercle. First lower molar with a welldeveloped inner tubercle at the base of the main cusp.


Skull of M. foina.
As Blasius has remarked, the differences of proportion are less conspicuous when a skull of an aged example of M. foina is compared with that of a young M. sylvatica than when individuals of the same age are contrasted; nevertheless they are always present to an appreciable degree. In his figures Blasius has represented a further distinction, in the form of the transverse ridges of the soft palate; but I have not had an opportunity of testing the constancy of this feature; nor have I sufficient materials for any original observations on the distinctive marks of the American and Siberian Martens, as to which I can ouly refer the reader to the descriptions of Drs. Coues ${ }^{1}$ and Middendorff ${ }^{2}$. On the whole it may be said

[^32]that the most striking and trustworthy of the characters enumerated above are, externally, the colour of the under fur, and, internally, the comparative breadth of the skull and the shape of the upper molar ${ }^{1}$.

Having thus cleared the ground as to the synonymy and distinguishing marks of the two European Martens, we come to the question whether both of them inhabit our own islands. Every

$$
\text { Fig. } 2 .
$$



Skull of M. sylvatica.
work hitherto published on the British fauna has either stated or assumed that both forms are natives; and almost every one has represented the white-breasted Martes foina (the Common Marten of the Continent) as being also the prevailing species in Britain. Several, however, of our best zoologists have expressed grave doubts as to the specific distinction of the two forms, or have even denied that they could be separated as constant varieties. This will be evident from a glance at the pages of the principal writers on the subject.
${ }^{1}$ It should be observed that Dr. Severtzoff has stated that our European
Martens are "not fully differentiated "in Eastern Turkestan, and has described
some skins which he saw there as a new species, Mustela intermedia (Turke-
stanskie Jevotnie, p. 80 ; Aun. \& Mag. Nat. Hist. 4th ser. xviii. p. 46); but as
he obtained no skulls, much weight camnot be laid on his observations.

Passing over the older writers, who merely copied the accounts of Gesner and Aldrovandus, we may come at once to Pennant, who describes Mustela foina as "The Martin," distinguishing "The Yellow-breasted Martin" as a distinct species, of which he says that it "is found in Great Britain; but is much less common in England than the former; it is sometimes taken in the counties of Merioneth and Caernarvon, where it is distinguished from the other kind by the name of bela goed, or Wood Martin, it being supposed entirely to inhabit the woods, the bela graig to dwell only among the rocks. Though this is so rare in these parts, yet in Scotland it is the only kind; where it inhabits the fir forests, building its nest at the top of the trees" ${ }^{1}$.

Pennant was followed by subsequent writers without much additional information being supplied. Thus Bingley states that the "Common Martin" is "not very uncommon in many of the southern parts of Great Britain and Ireland ;" while "Pine Martins are sometimes, though rarely, observed in the wooded and thinly inhabited districts of Wales and Scotland, and two or three of the northern counties of England " ${ }^{2}$.

Fleming gives the habitat of Martes fagorum as "In woods and rocks in the south of Scotland and England ;" that of M. abietum, " in the wooded districts of Wales and Scotland;" but adds that " the characters of these two species are ill-defined".".

The Rev. L. Jenyns in his excellent 'Manual' considered that Mustela foina was " more generally diffused " than M. martes, which, he says, "inhabits the fir-woods of Scotland: occurs also sparingly in the west of England " ".

Edward T. Bennett, then Secretary of this Society, discussed the question of the distinction of the Beech and Pine Martens in 1835, evidently inclining to the belief that they were specifically identical, and referring two British specimens then in the Society's Museum to the former and two others to the latter race ${ }^{5}$. What was the ultimate fate of these examples I know not; but it is to be remarked that no exact localities are mentioned, and that the supposed "Beech Martens" had "dirty-white breasts:" not improbably they were faded specimens.

Two years later appeared the first edition of Mr. Bell's standard work, in which he gave separate figures and descriptions of the two Martens, but "with the precaution of a protest against being considered as decidedly supporting the opinion that they are essentially different." No new information was here given as to the supposed distribution of the animals in this country ${ }^{6}$. In Scotland, however, the elder Macgillivray had better opportunities for observation, and a comparison of specimens convinced him of "the indivisibility of the species." Young specimens, he says, have yellow throats, and

[^33]are the Pine Martens of authors; while " in old individuals the whole fore-neck and part of the breast are white, or greyish white, or pale grey mottled with brownish. The yellow colour on the throat fades in specimens kept in Museums, so as at length to be scarcely perceptible" ${ }^{1}$. In Ireland W. Thompson came to similar conclusions, observing that "all the native specimens which have come under my own notice were yellow-breasted (Martes abietum), with the exception of one, which had the breast white (M. foina), and was killed in the county of Antrim." He adds that he had long since remarked that the yellow colour gave place to white with advancing age, and explained the greater number of yellowbreasted specimens obtained by their comparative immaturity ${ }^{2}$.

The author who has most recently treated of the question is Mr. Bell. In his revised second edition of the 'Quadrupeds' he fully accepts the specific distiuction of the two forms, regarding which he was formerly so doubtful, and quotes a letter from Mr. R. T. Vyner, who "concludes that the Beech Marten is at present much less common than the Pine, and is, indeed, very nearly extinct in England, which is accounted for by its habit of leaving its summer haunts of woods and rocky places, to inhabit, in the winter, farm buildings, faggot-stacks, and other similar localities, and thus becoming exposed to various means of destruction. The Pine Marten, on the contrary, continues to inhabit, at all seasons of the year, its accustomed retired haunts, rarely, if ever, intruding into the immediate purlieus of human habitations" ${ }^{3}$.

It will thus be seen that the later and better-informed English faunists gradually approached agreement as to the existence of only one species of Marten in Britain, and that some of them drew the natural though erroneous deduction that Martes sylvatica and M. foina were specifically identical. The fact is, as I believe, that M. foina is not, and never was, a member of the British fauna. During the last ten years I have missed no opportunity of examining native Martens, and have endeavoured to trace out every supposed "Beech Marten" that I could hear of. I have thus seen a very large number of specimens from various parts of England, Wales, Scotland, and Ireland; and every one has proved to be M. sylvatica. The late Mr. Blyth, who paid some attention to this question, assured me, shortly before his death, that his investigations had led him to the same result; and I bave been unable to find any competent observer acquainted with the true characters of the species, who has ever seen an authentic British-killed specimen of M. foina. Macgillivray and Thompson were certainly correct in saying that the pale-chested individuals which have usually received that name in this country are merely aged examples of the Pine Marten, or specimens which have faded in museums. Nor does there appear to be the slightest evidence in favour of Mr. Vyner's suggestion that M. foina has been recently exterminated in this country. Such a fate has not overtaken the species on the Continent, where it holds

[^34]its own fully as well as its ally ; and a subfossil skull found in Burwell Fen, Cambridgeshire, and exhibited to this Society in 1873, by Mr. J. W. Clark ${ }^{1}$, is certainly referable to M. sylvatica. The true Beech Marten is undoubtedly a more southern species than its congener, finding its northern limits in Denmark and the Baltic Provinces; for Professor Lilljeborg has proved that it is not, as had been stated, a native of Sweden ${ }^{2}$. Until an authentic British specimen has been produced, it must also, I think, be struck out of the lists of the British fauna.

I will conclude with a few remarks on the present distribution of the Pine Marten in Britain, much of the information being gleaned from the pages of the 'Zoologist.' Although greatly reduced in numbers by persecution, it still maintains its ground in the wilder districts of Scotland, the north of England, Wales, and Ireland, and occasionally specimens are killed in counties where the species was thought to have been long extinct. In Scotland it is still found, though comparatively rarely, in the Lews and in most of the Highland mainland counties, being perhaps most abundant in Sutherland and Ross-shire, especially in the deer-forests. In the Lowlands a Marten is now a very great rarity; but a fine example was killed in Ayrshire in the winter of 1875-76. In the north of England, Mr. W. A. Durnford says ${ }^{3}$, the species is "still plentiful;" in the wilder parts of Cumberland, Westmoreland, and Lancashire, and in Lincolnshire, several have been recorded, the latest, killed in 1865, by Mr. Cordeaux ${ }^{4}$. In Norfolk one was shot last year ${ }^{5}$; and I have myself examined a fine example, which was shot in Hertfordshire, within twenty miles of London, in December 1872. In Dorsetshire the last is said to have been killed in $1804^{6}$; but a specimen occurred in Hampshire about forty years ago ${ }^{7}$, and another in Surrey in 1847. A Marten is said, by the Rev. C. A. Bury, to have been "seen" in the Isle of Wight ${ }^{8}$; and one was recorded from Cornwall, by Mr. E. Hearle Rod ${ }^{9}$; but this proves on investigation to be an error, the specimen having been brought from North Wales, where Martens appear to be still not very rare. In Ireland the following counties were enumerated by Thompson as habitats of this species-Donegal, Londonderry, Antrim, Down, Armagh, Fermanagh, Longford, Galway, Tipperary, Cork, and Kerry ${ }^{10}$. The Cat-crann is probably now a rarer animal in Ireland than it was when Thompson wrote; but it still exists in various districts, especially in co. Kerry, whence the Society has received several living examples; and Professor A. Leith Adams states that it has been seen of late years even in co. Dublin ${ }^{11}$.

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3. On the Terrestrial Mollusca collected in Costa Rica by the late Dr. W. M. Gabb, with Descriptions of new Species. By George French Angas, C.M.Z.S., F.L.S., \&c.
[Receired May 26, 1879.]
(Plate XL.)
At the request of Mr. Thomas Bland, of New York (who has obligingly forwarded to me for examination the collection of landshells made in Costa Rica by the late Dr. Gabb), I have undertaken, as far as practicable, to give in the following paper a list of the species obtained in that country by Dr. Gabb, together with descriptions of such as appear to be new to science.

Mr. Bland has also been good enough to furnish me with notes regarding the habitats of the various species, together with drawings of several of the animals, taken from nature by Dr. Gabb; and these he has supplemented with some important remarks of his own. Although in some instances the number of specimens of a species sent is sufficient to form a good series for critical examination, in others there are but one or two examples available; therefore where there is any doubt in determining a species it will be marked with a ?. Through the liberality of Mr. Thomas Bland I have been enabled to place the type specimens(together with examples of most of the species sent), in the national collection in the British Museum.

Previous to Dr. Gabb's decease, several of the Mollusca collected by him in Costa Rica, and preserved in spirits (together with his original drawings of the animals), were submitted by him to Mr. W.G. Binney for examination. In a paper just published in the 'Annals of the New York Academy of Sciences' (vol. i. pl. 11), Mr. Binney gives descriptions and figures of two new genera and species, viz. Velifera gabbi and Cryptostrakon gabbi. He also figures the lingual dentition and the animals in motion. Furthermore, he figures the animals and the lingual dentition of Limax semitectus, Mörch, and of a species of Tebennophorus, which he supposes to be T. costaricensis of Mörch.

The species placed in my hands by Mr. Thos. Bland are as follow, viz. :-

1. Helix (Oxychona) zhorquinensis, n. sp. (Plate XL. fig. 1.)

Shell scarcely rimate, conically trochiform, rather thin, under the lens very minutely transversely shagreened upon the lower whorls and on the base, pale yellowish green, with a single narrow chocolate band in the middle of the three or sometimes four lower whorls, and a still narrower band of the same colour next below the sutures; whorls 6 , nearly flat, sharply keeled at the periphery ; sutures, the last three keeled and white; nucleolar whorls nearly smooth and shining, with a purplish-black line at the sutures, and spreading over
the apex, which is somewhat obtuse; base very slightly convex; aperture very oblique, subquadrate; outer lip expanded and sinuous above, with a produced horizontal beak at the periphery, arcuate and somewhat reflexed below.

Diam. maj. $13 \frac{1}{2}$, min. 10, alt. 10 lin.
Hab. Along the Zhorquin river, Costa Rica.
"Animal very slender, nearly white, pale brownish on head and top of body" (Gabb).

Five adult and three young specimens found, all of the same coloration.

This very remarkable and elegant shell is the gem of the collection. It belongs apparently to the same section as $H$. bifasciata from Brazil.
2. Helix esopus, Angas, P.Z.S. 1878, p. 72, pl. 5. figs. 11, 12.

Some of the specimens show a dark band round the umbilical region, and are larger than the type specimen figured in the Zoological Society's 'Proceedings,' whilst one of them shows traces of concentric lines, especially towards the front of the last whorl.

The nearest ally to this species is $H$. triplicata, Martens, which, however, is smaller, and differs in the shape of the peritreme.
"The animal is grey above, with the foot nearly white" (Gabb).
Found in the coast region and to the hills of Uren, at an altitude of 3000 feet. The type specimen was found at Buena Vista at a similar altitude.

Seventeen specimens found, five only unbleached.
3. Helix mac-neili, Crosse, Journal de Conch. vol. xxi. p. 67.

Of this small species only three fresh specimens and a few dead ones were found.
"Animal dark brown ; tail and foot slightly lighter; upper tentacles long" (Gabb).

Coast region and lower hills, from Parismina to the hills of Zhorquin.
4. Helix costaricensis, Roth ; Pfr. Mon. Hel. iv. p. 302 ; Pfr. Novitat. i. 21. 15-17.

This is an extremely variable species, both in colour and form as well as in size; still I cannot detect in the series before me any differences that would amount to specific characters. The base is insariably white, with a dark-brown umbilicus, and the umbilical region tinged with bright yellow. The three principal varieties appear to be :-1st, large, depressed, white, with two or three narrow dark-brown bands; 2nd, small, depressed, with the upper surface light or dark brown throughout, or zoned with both colours; 3rd, medium in size, much more conical, with two broad bands of light brown, or all light brown above. This last variety was described by me in this Society's 'Proceedings' for 1878, under the name of Helix boucardi, from specimens brought home by Mons. Boucard from the region
of Navarro, and found on the leaves of trees. I now consider it (after a careful examination of all the specimens) to be an extreme variety of $H$. costaricensis.
"Animal dark grey above, foot white" (Gabb).
High hills only; commonest in Cabecar.
About a dozen living and a number of dead specimens found, varying in size and coloration.
5. Helix (Solaropsis) tiloriensis, n. sp. (Plate XL. fig. 2.)

Shell minutely and profoundly umbilicated, depressedly globose, thin, ornamented with oblique transverse rows of minute granules, from which spring very short, erect, dark brown bristles ; pale brown, with one narrow band of dark chestnut towards the basal portion of the last whorl, and another similar band above near the suture-the space between it and the suture, as well as the upper whorls, being crossed with wavy dark chestnut markings, whilst the central portion of the body-whorl is ornamented with light brown transverse angular markings that form a very narrow indistinct band in the middle of the whorl. Whorls $4 \frac{1}{2}$, the last very large and rounded, the upper whorls flat; spire concavely depressed ; aperture broadly crescent-shaped; outer lip arcuate, a little reflexed; columellar margin slightly expanded over the umbilicus.

Diam. maj. 9, min. $7 \frac{1}{2}$, alt. 5 lin.
Hab. Hills between the rivers Tilorio and Zhorquin.
Only three specimens found.
This species comesnearest to H. andicola, Pfr., from South America; but the latter has the spire raised above the plane of the last whorl, the granules much more numerous, and not set in regular oblique rows, and has also a different style of coloration.

## 6. Bulimus gabbi, n. sp. (Plate XL. fig. 3.)

Shell imperforate, somewhat elongately ovate, moderately solid, faintly, obscurely, longitudinally striated, shining, straw-colour ; the entire peritreme bright rose-colour ; whorls 5 , convex; spire shorter than the aperture ; aperture large, effuse, oblique; outer lip somewhat thickened and expanded.

Var. a. Pinkish brown, obscurely banded with darker brown, and freckled and spotted with white.

Var. b. Opaque white, marked with a few irregular bands of dark brown arrow-shaped spots.

Var. c. White, with two or three brown bands spotted with white.
Diam. 7 , alt. $10 \frac{1}{2}$ lin.
$H a b$. On the ground, upon the flanks of Pico Blanco, at an altitude of from 3000 to 6000 feet.
"Foot broad, pointed, and very flat. Animal varies with the colour of the shell from white to ash-colour, greenish white, or light brown" (Gabb). (Plate XL. fig. 3 a.)

This pretty species was sent as "B. irazuensis?, Angas," but is totally distinct from it, the only character in common being the rose-coloured peritreme.
7. Bulimus josephus, Angas, P.Z.S. 1878, p. 73, pl. 5. figs. 13, 14.

Very few specimens found.
"On the lower hills, Talamanca" (Gabb).
My type specimens were obtained on the trunks of acacia trees, San José, Costa Rica.
8. Bulimus attenuatus, Pfr. Mon. Hel. iii. p. 336 ; Chemu. ed. Nov. 30. 9, 10.
"Dota, a high hill region south of San José" (Gabb).
This species is closely allied to B. costaricensis, Pfr., but is more elongated, and has a twist on the columella, with a somewhat different style of painting.

Three specimens only.
9. Bulimus costaricensis, Pfr. Mon. Hel. vi. 47; Novitat. iii. 95. 11, 12.

Costa Rica.
The specimens are all poor and in bad condition.
10. Bulmus tripictus, Albert, Mal. Blätt. iv. 1857, p. 97 ; Pfr. Mơn. Hel. iv. p. 48.
B. rhodotrema, Martens, Mal. Bl. 1868, p. 156 ; Pfr. Novitat. iii. 101. 10, 11.

Costa Rica. A very beautiful little, thin, globose species, pale greenish yellow, ornamented with three dark-brown transverse bands of oblique stripes and spots, with the lip and columella rose-colour.

## 11. Bulimus zhorquinensis, n. sp. (Plate XL. fig. 4.)

Shell somewhat broadly perforate, elongately ovate, moderately solid, rather coarsely and irregularly obliquely striated, especially towards the base of the last whorl, crossed here and there with single or double narrow impressed lines, between which are rows of numerous short descending striæ; whitish or pale brown, painted with narrow, distant, longitudinal darker brown flames; whorls 7, rather convex; spire sharply conical; sutures impressed; apex strawcoloured; aperture large, ovate, effuse, pale lilac-brown within; outer lip white, very much expanded, flattened and a little recurved; columella triangularly flattened and expanded over the umbilical region, ending in a blunt rounded callus interiorly.

Diam. 12, alt. 23 lin.
Hab. "Middle Zhorquin to Cuabre, low hills and flat ground" (Gabb).
This fine shell (of which only three specimens were obtained) resembles B. expansus, Pfr., in shape, but wants the sharp longitudinal sculpture and the dark purple mouth. "It is also allied to B. pallidior", Sow., from "Central America;" but that shell is entirely white, and with a much less expanded lip. It is somewhat like B. excelsus, Gould, which, however, is much narrower, and has
a smaller lip and is of a brown colour, with distant white longitudinal zones. Another of the same group is B. lilacinus, Rve., also from " Central America," which is white, with violet columella; and still another is B. liliaceus, Guild., which is from the West Indies, and is a less solid shell, more contracted, with the aperture less rounded at the base, has a pink tinge, and a much smaller umbilicus, and the outer lip not nearly so much expanded as in B. zhorquinensis.

## 12. Bulimus citronellus, n. sp. (Plate XL. fig. 5.)

Shell elongately ovate, minutely perforated, rather thin, very finely and closely transversely sculptured with delicate impressed strix, pale yellow or citron-colour throughout; whorls 7, flatly convex; apex conical; sutures impressed, white; aperture ovate; outer lip thin, slightly expanded towards the base; columella triangularly flattened over the perforation.

Diam. 6, alt. 12 lin.
Hab. "Uren to Lipurio, low hills" (Gabb).
"Animal white ; upper tentacles very long; arboreal" (Gabb).
Only two specimens.
13. Bulimus maculatus, Lea, Trans. Am. Phil. Soc. 1839, p. 86, pl. 22. fig. 112.

## Costa Rica.

The specimen in the British Museum is from Chiriqui Mountain, "Central America."

A small elongate species, pale yellow, banded with light and dark purplish brown.

## 14. Bulimus corneus, Sow.

Shell rimate, ovate, rather thin, irregularly finely obliquely striated, pale brown throughout; whorls 6 , moderately convex; spire equal in length to the aperture; sutures impressed; aperture ovate; outer lip thin, simple ; columellar, margin slightly expanded over the perforation; margins united by a thin callus.

Diam. 5, alt. 9 lin.
Hab. Tilorio and Zhorquin rivers" (Gabb).
"Animal small, yellowish white; tail does not reach to the apex of the shell; tentacles short, dark " (Gabb).

A small species of simple aspect, of a uniform pale-brown colour, allied to $B$. behrendti, Pfr.
15. Glandina lignaria, Reeve.

Achatina lignaria, Reeve, Conchol. Icon. Achatina, pl. 8. fig. 27 (1849).

Glandina sowerbyana, form A, Strebel, Mexik. Land- und Süssw.Conch. ii. Taf. v. figs. $10 a, 106$.

Euglandina lignaria, Crosse et Fischer, Expéd. Scient. du Mesique, Mollusca, pl. 3. fig. 1.

Two specimens found.
"Only in high country, as high as 6000 feet, Costa Rica" (Gabb).

Dr. Gabb gives the following notes respecting the animal :-" Head and appendages and all the upper surface black; upper margin of foot yellowish brown. Entire surface granulated and corrugated. A groove around the anterior and inner base of each upper tentacle, becoming parallel and running posteriorly to the shell, leaving a median linear ridge. Lateral appendages in part retractile, and, when at rest, curved backwards against the sides of the head. Their front edges acute, posterior edges thicker and rounded. On expanding, first the upper tentacles are protruded, then the lower, and finally the lateral appendages. Sole of the foot perfectly black. On being disturbed the animal withdraws into the shell, all except the foot, which remains outside with its edges corrugated. Doubtless in dry weather the whole could be retracted; but the specimen which I drew could not."

## 16. Glandina sowerbyana, Pfr. <br> Achatina (Glandina) sowerbyana, Pfr. P.Z.S. 1846, p. 32. <br> Achatina sowerbyana, Reeve, Conch. Icon. Achatina, pl. 8.

 figs. $26 a \& b$.Glandina sowerbyana, form B, Strebel, Mexik. Land- und Süssw.Conch. ii. Taf. v. A. fig. 10 m .

Only two specimens found.
Although Strebel considers G. lignaria, Reeve, to be only a variety of this species, I am inclined, with MM. Crosse and Fischer, to regard it as distinct. G. sowerbyana is much more ovate, has a shorter spire and a larger aperture, with a coarser granulated sculpture and a more solid texture than G. lignaria, which is more fusiform, thinner, and very finely granulated. The same differences of character are also strongly marked in the young shells.

Locality similar to that of the last species.

## 17. Glandina aurata? Morelet.

Glandina aurata, Morelet, Test. Noviss. i. no. 20, p. 12 (1849).
Glandina aurata, Crosse et Fischer, Expéd. Scient. du Mexique, Mollusca, pl. 3. figs. 7, $7 a$.

Costa Rica.
Only one specimen obtained, with the living animal (Plate XL. fig. 6.)

This shell is more like G. aurata of Morelet than any other ; indeed I cannot detect any specific difference.
18. Glandina isabellina, Pfr., var.

Achatina isabellina, Pfr. P.Z.S. 1846, p. 32 ; Reeve, Conch. Icon. Achatina, pl. 21. fig. 95.
"Several specimens met with, but few in good condition. Rare; from the hills, Costa Rica" (Gabb).

This appears to be a variety of $G$. isabellina, Pfr., with the last
whorl somewhat broader and the aperture more effuse than in the Mexican specimens in the British Museum. This species is allied to G. conularis, Pfr., and G. obtusa, Pfr., the former of which is from Mexico, and the latter from Nicaragua. The Costa-Rica specimens are larger than the typical ones. The delicate concentric lines (seen through the lens) by which the whorls are crossed are characteristic of this species.

The animal, which is of the same pale isabelline colour as the shell, is entirely retractile.

## 19. Glandina aurantiaca, n. sp. (Plate XL. fig. 8.)

Shell fusiformly oblong, moderately thin, smooth, shining, bright tawny orange, darker towards the base of the columella; whorls $5 \frac{1}{2}$, slightly convex ; spire papillose, obtuse; sutures impressed, and of a dark purple colour; columella slightly oblique, shortly truncated in front; outer lip moderately arcuate, simple, not effuse towards the base; aperture elliptically oblong, half the length of the shell, pale rosy purple within.

Diam. 5 alt. 11 lin.
"From the hilly country," Costa Rica.
This species, of which only a single example was found, is somewhat allied to G. isabellina, Pfr., but is smaller, of a different colour and texture, and quite smooth, with no traces of the fine concentric lines characteristic of that species; and, moreover, it has the sutures banded with purplish brown.
20. Glandina (Oleacina) anomala, n. sp. (Plate XL. fig. 9.)

Shell elongately oblong, turreted, thin, shining yellewish olivegreen, dark brown towards the apex; whorls 7, very slightly convex, flatly longitudinally striate, the strix becoming obsolete towards the lower portion of the whorls, especially on the last; spire very large and obtuse ; apex rounded, tumid; sutures strongly granulated; columella very slightly arcuate; outer lip simple, nearly straight; aperture small, much shorter than the spire, narrowly subquadrate.

Diam. 6, alt. $17 \frac{1}{2}$ lin.
Hab. "Hilly regions," Costa Rica.
This species, which is allied to G. turris, Pfr., and G. pseudo-turris, Strebel, is remarkable for its large swollen obtuse spire and small aperture. The longitudinal striæ do not come quite down to the sutures, as in $G$. turris; and the sutures are strongly granulated.
21. Glandina (Oleacina) mitriformis, n. sp. (Plate XL. fig. 10.)

Shell elongately ovate, turreted, moderately thin, shining, irregularly obsoletely striated, striæ finer and closer on the upper whorls, olive-chestnut, with a narrow yellow zone next below the suture; whorls 5 , slightly convex, the last more than half the entire length of the shell ; spire short, conical, apex rather obtuse; columella slightly arcuate ; outer lip simple, nearly straight ; margins united Proc. Zool. Soc.-1879, No. XXXI.
by a callus; aperture elongately ovate, half the leugth of the shell, lilac within.

Diam. $6 \frac{1}{2}$, alt. 14 lin.
Only one specimen.
Mab. "Middle Zhorquin to Cuabre (low hills and flat ground)" (Gabb).
22. Glandina (Oleacina) strebeli, n. sp. (Plate XL. fig. 11.)

Shell elongately ovate, thin, shining, finely longitudinally striated, the strix nearly obselete on the last whorl, olive-green; whorls $5 \frac{1}{2}$, slightly convex ; spire elongately conical ; apex rounded and blunt ; sutures simply impressed; aperture narrowly elliptical; outer lip thin, nearly straight ; columella arcuate, margins united by a thin callus.

Diam. 5, alt. $11 \frac{1}{2}$ lin.
Mab. "Middle Zhorquin to Cuabre (low hills)" (Gabb).
Not unlike G. turris, Pfr., but only half the length, narrower, more compressed at the base of the aperture, of a different colour, and with a less number of whorls.
23. Streptostyla boucardi, Pfr., var.?

Spiraxis boucardi, Pfr., P. Z. S. 1861, p. 24.
This species approaches very near to S. boucardi, Pfr., of which I am inclined to consider it a variety.

Five specimens were found "on the ridge between Tilorio and Zhorquin" (Gabb).
"Animal light brown above, whitish below and posteriorly; tentacles dark brown; carries the tip of the tail slightly turned up in travelling " (Gabb).

This species must not be confounded with S. bocourti, Crosse \& Fischer.
24. Streptostyla viridula, n. sp. (Plate XL. fig. 12.)

Shell ovate, thin, shining, longitudinally striate at the upper part of the whorls, the strix becoming almost obsolete on the lower half of the last whorl, pale yellowish green throughout; whorls 6 , somewhat convex; spire conoidal ; apex but slightly obtuse; sutures subcanaliculate; outer lip very slightly sinuous, nearly straight in the middle; columella strongly twisted and everted at the base; aperture subauriform, nearly two thirds the length of the shell.

Diam. 5, alt. 8 lin.
Hab. Hills of Uren, Costa Rica.
25. Streptostyla cylindracea, Pfi.?

Achatina cylindracea, Pfr., P.Z.S. 1846, p. 31; Reeve, Conch. Icon. Achatina, pl. 18. fig. 91.
As there is only a single specimen, I hesitate to identify it positively; but it comes nearer to S. cylindracea than to any thing else I cau find.

Costa Rica.
26. Orthalicus zebra, Müll.
O. zebra, Müll. Verm. terr. et fluv. Hist. 138; Recve, Conch. Icon. Bulimus, pl. 15. fig. 90.

Bulimus princeps, Brod.
Bulimus undulatus, Brug.
Bulimus zigzag, Lam.
All poor and dead specimens.
"Rare, in the valley about Lipurio; 200 feet above the sea in Talamanca" (Gabb).
27. Cxclotus boucardi, Angas.

Cyclotus boucardi, Angas, P. Z. S. 1878, pl. 5. figs. 3, 4.
Only a single specimen found, larger than the type, measuring 2 inches across.
"Mouth of Banana River, 5 miles from Limon" (Gabb).
28. Cyclotus irregularis, Pfr.

Cyclotus irregularis, Pfr. P. Z. S. 1855, p. 117.
A large number of specimens. "The commonest shell in Talamanca; coast region, and to 500 feet high on the hills" (Gabb). "Animal pinkish; tentacles bright red " (Gabb.).
There are two well-marked varieties of this species:-one large ( 1 in .10 lines across), bright chestnut, with a pale band at the periphery; the other smaller ( 1 in .5 lines across), pale yellowish olive, with a narrow brown band at the periphery.
It is curious in how many specimens the lower margin of the peritreme appears to have been injured and repair commenced, giving the appearance of a second sinus. Of this remarkable injury, at different ages of the shell, Mr. Bland remarks:-"Examination at the outer edge of the peristome induces me to believe that the animal from time to time produces this injury by grazing, so to say, to satisfy a demand for lime."
29. Cyclotus dysoni, Pfr.

Cyclotus dysoni, Pfr. P. Z.S. 1851, p. 243.
"Only on hills, not common" (Gabb); Cervantes, Costa Rica.
30. Cyclotus translucidus, Sow.

Cyclotus translucidus, Sow.; Pfr., Monog. Pneumon. vi. vol. i. p. 20.

Eight specimens found, all of a somewhat dwarf form as compared with the type. "Lepanta" (Gabb).

## 31. Cyclophorus lutescens, Pfr., var.

Cyclophorus lutescens, Pfr. P.Z.S. 1851, p. 250; Chemn. Conch.Cab. ed. 2, p. 333, pl. 43. figs. 12-14.

> Very few specimens. "Lepanta, Nicoyo" (Gabb). Curiously like Cyclophorus wahlbergi, Benson, from Zululand.
32. Helicina lindeni, Pfr.
H. lindeni, Pfr. Monog. Pneumon. Viv. vol. i. p. 388 ; Chemn. Conch.-Cab. ed. 2, p. 52, pl. 8. figs. 25, 26.

The specimens, of which three were found, are rather larger than the type, which is from Mexico. Costa Rica,
33. Helicina funki, Pfr., large var. (Plate XL. fig. 7, animal.)
H. funki, Pfr. Monog. Pneumon. Viv. vol. i. p. 361.

Many specimens. "Talamanca, all the coast region, and to the lower hills" (Gabb).
" Animal brownish white; head and lower tentacles white ; animal very timid" (Gabb). Much larger than the type, which is from New Granada. Varies in colour from straw-yellow to orange.
34. Helicina lyrata, Pfr.

Helicina lyrata Pfr. Monog. Pneumon. Viv. vol. i. p. 341.
One specimen. Costa Rica.
35. Helicina beatrix, n. sp. (Plate XL. fig. 13.)

Shell conical, solid, shining; as seen through the lens, very finely transversely striated; whorls 6, very slightly convex, the four uppermost chestnut, the fifth dark red, with an opaque whitish band below the suture, the last pale olive-green, with a similar opaque band at the suture; outer lip thickened, a little expanded and reflexed; aperture quadrately semilunate.

Var. Smaller and straw-coloured throughout.
Diam. $4 \frac{\mathrm{I}}{2}$, alt. 5 lin.
Very few specimens. "Found only on the hills up to an elevation of 2500 feet. Animal dark grey above, sides and foot white" (Gabb). Approaches H. heloise, Sallé, but larger and much more conical.

## 36. Succinea undulata, Say.

Succinea undulata, Say, New Terrestrial Shells, p. 24.
"Coast region to lower hills" (Gabb). A dozen specimens. "Animal bright flesh-colour, robust, and marked by a few dark spots; lower tentacles very short" (Gabb).
37. Stenopus Guildingi, n. sp. (Plate XL. fig. 14.)

Shell perforate, globosely conical, thin, shining, very finely obliquely striated, brownish ash-colour ; whorls $6 \frac{1}{2}$, convex, the last with a thread-like keel at the periphery; apex conical; sutures margined; base convex ; aperture crescent-shaped; outer lip arcuate, simple, thin ; columellar margin scarcely dilated.

Diam. 2, alt. $1 \frac{1}{2}$ lin.
Hab. Costa Rica.
This little species differs from S. lividus, Guild., in having the sutures margined with a strongly defined thread-like carina at the periphery, and one more whorl.
38. Stenopus micans, n. sp. (Plate XL. fig. 15.)

Shell narrowly perforate, depressedly conical, thin, shining, nearly smooth, under the lens showing extremely faint oblique lines of growth, light fulvous brown; whorls 5 , very slightly convex, the last bluntly angled at the periphery; sutures impressed; base flatly convex, with just traces of a very faint rudimentary keel between the umbilicus and the periphery ; aperture semilunar ; outer lip simple, thin ; columellar margin very slightly expanded towards the umbilical region.

Diam. 2, alt. $1 \frac{1}{4}$ lin.
Hab. Costa Rica.
This species wants the marginal sutures and the thread-like carina of the preceding one.
39. Stenogyra octona ?, Chemn. (Plate XL. fig. 16, animal.)

This species comes remarkably close to S. octona, Chemn., which has a wide range, being found in Guayaquil, Brazil, and the West-Indian islands. I cannot detect any difference between this species and $S$. trochlea, Pfr., the habitat of which is given as Peru.

Many specimens.
Gabb gives as the habitat "Old Harbour." He describes the animal as " yellowish white, and wrinkled."
40. Stenogyra octonoides, C. B. Ad., =S. contracta, Poey.

Two specimens only. Costa Rica.
41. Stenogyra gabbiana, n. sp. (Plate XL. fig. 17.)

Shell perforate, elongately turreted, moderately thin, pale strawcoloured, sculptured with somewhat distant raised thread-like descending strix, that are strongest on the upper whorls and become evanescent towards the sutures and the base of the last whorl ; whorls 8, convex; apex blunt, papillose; aperture vertical, quadrately semilunar; outer lip arcuate, thin, simple; columellar margin a little expanded over the perforation.

Diam. $1 \frac{1}{4}$, alt. $3 \frac{1}{4}$ lin.
Hab. Costa Rica. A single specimen.
A somewhat sparsely and strongly ribbed species, distinct from $S$. caraccasensis, Reeve, which is described by that author as a Bulimus.
42. Leptinaria interstriata, Tate.

Tornatellina interstriata, American Journ. Conch. 1870, p. 157.
Shell minutely rimate, elongately ovate, turreted, thin, hyaline, ornamented with somewhat distant, raised, slightly curved longitudinal strix, that disappear towards the middle of the last whorl ; whorls 6, convex; apex blunt, papillose; sutures margined ; aperture ovately semilunar; outer lip simple, thin, arcuate ; columella with a single sinuous fold truncated below.

Diam. 1 $1 \frac{1}{4}$, alt. 3 lin. A single specimen.
Hab. Costa Rica.

## EXPLANATION OF PLATE XL.

Fig. 1. Helix (Oxychona) zhorquinensis, n. sp., p. 475.
2. - (Solaropsis) tiloriensis, n. sp., p. 477.
3. Bulimus gabbi, n. sp., p. 477.

3 a. ———, animal, p. 477.
4. - zhorquinensis, n. sp., p. 478.
5. - citronellus, n. sp., p. 479.
6. Glandina aurata?, animal, p. 480.
7. Helicina funki, animal, p. 484.
8. Glandina aurantiaca, n. sp., p. 481.
9. - (Oleacina) anomala, p. 481.
10. - (—) mitriformis, p. 481.
11. - (—) strebeli, n. sp., p. 482.
12. Streptostyla viridula, n. sp., p. 482.
13. Helicina beatrix, n. sp., p. 484.
14. Stenopus guildingi, n. sp., p. 484.
15. Stenopus micans, n. sp., p. 485.
16. Stenogyra octone ?, animal, p. 485.
17. -gabbiana, n. sp., p. 485.


#### Abstract

4. On the Birds collected by the late Mr. T. K. Salmon in the State of Antioquia, United States of Colombia. By P. L. Sclater, M.A., Ph.D., F.R.S., Secretary to the Socicty, and Osbert Salivin, M.A., F.R.S.


[Received May 20, 1879.]
(Plates XLI.-XLIII.)
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IV. List of Species collected by Mr. Salmon ..................................... 491
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## I. Introduction.

The late Mr. Thomas Knight Salmon, of Guildford, was for several years previous to his death, which took place at Guildford on the 5 th of May last, resident at Medellin, the capital city of the State of Antioquia, U.S. of Colombia. Mr. Salmon was a most enthusiastic and energetic collector, and, when not occupied in the service of the Government of the State of Antioquia, deroted all his leisure time to excursions into the country surrounding Medellin, in order to collect specimens of the abundant natural products of the varied fauna of Colombia. In this he was very successful, and transmitted large collections of mammals, birds, insects, and other animals to his agent Mr. E. Gerrard, at various periods from 1872 to 1878 . On his final return to this country last year, Mr. Salmon brought with him, besides a large quantity of bird-skins, a series of 163 nests and eggs. As each nest was numbered to cerrespond with a parent bird, the determination of the species to which they belong has been readily effected.




6



Altogether, in the eight collections transmitted by Mr. Salmon about 3500 specimens of birds have passed through our hands. Some of the new species contained in them have been already laid before the Society ${ }^{1}$. But in justice to Mr. Salmon's memory and in the interests of science, we have thought it right that some further record of so fine and extensive a series (embracing specimens of 468 species) from such a little-known locality should be made. We have therefore compiled the subjoined list of the birds represented in Mr. Salmon's collections, with an indication of the exact localities in which each species was obtained, and an account of the nest and eggs where sent.

Except in the case of some of the very commonest, examples of Mr. Salmon's species have been kept either for the collection of Sclater (Mus. P.L.S.), or for that of Salvin and Godman (Mus. S.-G.), as indicated in the subjoined list. The nests and eggs have been deposited in the British Museum.

We have incorporated into our list Mr. Salmon's valuable M.S. notes on the nests and eggs, and have appended his initials (T. K. S.) to them.

The following is a list of the species new to science discovered by Mr. Salmon :-

1. Catharus phcoopleurus, Scl. et Salv. P.Z. S. 1875, p. $5 \not 41$.
2. Cyphorinus dichrous, Scl. et Salv. infra, p. 492.
3. Setophaya chrysops, Salv. Ibis, 1878, p. 314.
4. Chlorochrysa nitidissima, Scl. P. Z. S. 1873, p. 728.
5. Buarremon elceoprorus, Scl. et Salv, infrù, p. 504.
6. Automolus holostictus, Scl. et Salv. P.Z. S. 1875, p. 542.
7. -ignobilis, Scl. et Salv. infrà̀, p. 522.
8. Grallaria ruficeps, Scl. P. Z. S. 1873, p. 729.
9.     - Alavo-tincta, Scl. Ibis, 1877, p. 445.
10. -rufo-cinerea, Scl. et Salv. infrì p. 526.
11. Chloronerpes dignus, Scl. et Salv P. Z. S. 1877, p. 20.
12. Brachygalba salmoni, Scl. et Salv. infrà, p. 535.
13. Buteo hypospodius, Gurney, Ibis, 1876, p. 73, pl. iii.
14. Tigrisoma salmoni, Scl. et Salv. P. Z. S. 1875, p. 38.

## II. Account of Mr. Salmon's Localities.

The exact localities where Mr. Salmon obtained his birds are mostly marked in the map which we now exhibit (see p. 488), copied from de Greiff's map of the province of Antioquia ${ }^{2}$. As will be scen, they lie mostly on affluents of the Magdalena and Cauca, though one is on the sources of the Sucio, which flows into the Atrato. The following gives such indications of them as we have been enabled to collect, partly from verbal communications with Mr. Salmon, partly from the map and other documents.

[^36]

Antioquia lies on the left bank of the Cauca, some eight or ten miles off.

Cauca. The locality thus indicated is probably intended for the valley of the Cauca, which Mr. Salmon crossed on his routes to Antioquia, and on his expeditions to Concordia and Jerico.

Concordia is some 10 miles off the left bank of the Cauca, at an elevation of 5000 feet, and about 50 miles south-west of Medelin.

Envigado is near the sources of the Rio Poru, a confluent of the Cauca, and lies 12 miles south of Medellin, at an altitude of 5500 feet.

Frontino is on the upper waters of the Sucio, which flows into the Atrato, some 30 or 40 miles west of Antioquia city.

Jerico is on the left bank of the Cauca, south of Medellin. Here the splendid new Tanager Chlorochrysa nitidissima was obtained.

Medellin, the capital of the State of Antioquia, is situated on the Rio Poru, a brauch of the Cauca. Its elevation is about 5000 feet.

Pocune. Rio Pocune is near Remedios, and is a small confluent of the Rio Vagre, which runs into the Neche and so into the Poru. Mr. Salmon's collecting-station here was at an altitude of about 1970 feet.

Remedios (elevation 2360 feet) is far to the north-east of Medellin, and is on the upper source of the Ité, a confluent of the Magdalena.

Retiro lies 25 miles south of Medelliu, beyond Envigado, at an elevation of 8000 feet.

Rio Neche or Nichi is a confluent of the Rio Poru, which it enters at Dos Bocas. Mr. Salmon's collections were made a few miles above the confluence.

Rio Negro is a town on the river of the same name, which runs into the Magdalena. This town is some 25 miles east of Medellin.

Sta. Elena we have not been able to find marked in de Greiff's map. But we ascertain from Mosquera's 'Diccionario geográfico' that it is "a Quebrada" between $5^{\circ}$ and $6^{\circ} \mathrm{N}$. lat. It is therefore probably on the right bank of the Cauca, somewhere between Retiro and Jerico.

San Miguel is also not marked in the map. General Mosquera gives five places of this name in the State of Antioquia.

## III. Short Summary of preceding Authorities on the Brids of Colombia.

Our knowledge of the ornithology of this part of South A merica is mainly due to the large collections of bird-skins made since 1840 by native collectors in the vicinity of Bogotá, the capital of the Confederation, and imported into Europe as merchandise. These skins are of very pcculiar "make," and are well known to all ornithologists.

The circumstances under which these skins are collected, and a full list of the species contained in them as far as they were known
to the author, were given by Sclater in a paper read before the Society in 1855, and in two supplementary communications on the same subject ${ }^{1}$.

An account of the Trochilidx of the vicinity of Bogotá, and of the localities in which they are obtained, has also been given by M. L. de Geoffroy, Secretary to the French Legation at Bogotá, in a paper published in Uricoechea's 'Contribuciones de Colombia a las Ciencias y a las Artes' ${ }^{2}$.

Since Sclater's papers were published, examples of many additional species have been received in "Bogotá" collections; and a complete list of "Bogotá" birdskins would embrace probably 700 species, instead of 510 given in Sclater's papers. Unfortunately, however, no record has ever been made of the exact localities whence these skins are obtained ; and it seems certain that "Bogota'" collections embrace examples of species peculiar to the ralleys on the east side of the Andean range (i.e.from the watershed of the Orinoco), as well as of species from the valleys on the west side and from the elevated districts surrounding Bogotá itself.

Besides "Bogotá skins" and their literature, we have, so far as we know, putting aside occasional notices of individual species, only three authorities on the birds of Colombia to refer to. These are:-

1. Mr. Cassin's Catalogue of the birds collected during the U.S. Survey of the Isthmus of Darien, published in $1861^{3}$. Mr. Cassin enumerated 144 species in this memoir, some of the rarities of which, as hereafter noticed, recur in the present collection from the neighbouring State of Antioquia.
2. Mr. Wyatt's articles on the birds obtained by him during his expedition to the Andes of Ocaña in $1870^{4}$. Mr Wyatt enumerated 210 species as met with by him in this district, some of the more remarkable of which occur also in the present collection.

[^37]3. Messrs. Salvin and Godman's account of the birds collected by Mr. Simon during his exploration of the Sierra Nevada of Santa Marta, now in progress. This was commenced in 'The Ibis' for January last ${ }^{2}$, and will be continued in future numbers, as the work progresses.

## IV. List of Species collected by Mr. Salmon.

## PASSERES.

## Fam. Turdide.

1. Catharus pheopleurus, Scl. et Salv. P. Z. S. 1875, p. 541. Medellin. (Mus. P. L. S. and S.-G.)
"Food, insects. Builds in low bushes. Nest made of moss, grass, and fine roots."

Eggs (no. 28) pale bluish green, spotted with two or three shades of red-brown and lilac spots of various sizes, especially at the larger end : axis $\cdot 95$, diam. $\cdot 72$.
2. Turdus swainsoni, Cab.

## (Mus. S.-G.)

A single skin in the sixth collection, without precise locality.
3. Turdus ignobilis, Scl. P. Z. S. 1857, p. 273.

Turdus leucomelas, Scl. et Salv. Ex. Orn. p. 123 (partim).
Retiro, Cauca, Sta. Elena. (Mus. P. L. S. and S.-G.)
Iris dark.
The eggs (no. 108) are palegreenishblue, thickly spotted, especially at the larger end, with several shades of red-brown; other eggs are nearly uniformly sprinkled with smaller and paler spots of red-brown: axis $1 \cdot 16$, diam. $\cdot 84$.

Under this name (founded originally upon Bogotá skins) we are now inclined to resuscitate a species lately united by us to Turdus leucomelas. The Colombian form is more uniformly dusky beneath, has less white on the throat, and its bill is always black.
4. Turdus gigas, Fraser.

Retiro and Sta. Elena. (Mus. P. L. S. and S.-G.)
"Bill and feet orange ; iris dark: food, worms and berries."
Eggs (no.107) pale greenish-blue, spotted chiefly at the larger end with red-brown spots of several shades; some eggs are paler and the spots more uniform in size and more evenly distributed: axis $1 \cdot 35$, diam. ${ }^{\circ} 95$.
5. Turdus serranus, Tsch.; Scl. et Salv. P.Z.S. 1870, p. 783.

Jerico, Frontino. (Mus. P. L, S. and S.-G.)
Iris dark; food, fruit.

[^38]Eggs (no. 85) pale greenish-blue with blotches of pale red-brown, just as in some specimens of Turdus merula : axis $1 \cdot 17$, diam. $\cdot 8$.
6. Mimus gilvus, Vieill.

Medellin (Mus. S.-G.)
Iris dark.
Eggs (no. 59) pale greenish-blue, spotted chiefly at the larger end with large and small spots of several shades of red-brown: axis $1 \cdot 05$, diam. 8 .

Fam. Cinclide.
7. Cinclues leuconotus, Scl. P. Z. S. 1857, p. 274; Cat A. B. pl. ii. ; Salv. Ibis, 1867, p. 122.

Retiro and Frontino. (Mus. P. L.S. and S.-G.)
Iris dark.

## Fam. Sylivide.

8. Myiadestes ralloides (Lafr. et d'Orb.); Scl. et Salv. Ex. Orn. t. xxvii.

Retiro, Concordia, Medellin, Sta. Elena. (Mus. P. L. S. and S-G.)

Iris red-brown. Found in the deep forest.
Eggs (no. 11) pale reddish white, thickly spotied and freckled with red spots, chiefly at the larger end: axis $\cdot 91$, diam. $\cdot 7$.

Fam. Troglodytide.
9. Cinnicerthia unibrunnea (Lafr.); Scl. Cat. A. B. p. 18.

Retiro, Sta. Elena. (Mus. P. L. S. and S.-G.)
Food, insects.
Mr. Salmon's specimens do not agree absolutely with examples of C. unibrunnea from Ecuador. They are all browner in colour, and the transverse markings of the wings and tail are much more clearly defined. In several specimens many of the feathers of the forehead are white; but as this character is of uncertain amount and absent in the majority of examples, it cannot be deemed a distinctive feature.
10. Cyphorhinus pheocephalus, Scl. P. Z. S. 1861, p. 291.

Remedios. (Mus. S.-G.)
Iris dark ; food, insects.
A species of Western Ecuador.
11. Cyphorhinus dichrous, sp. n. (Plate XlI.)

Obscure fumoso-brunneus in nigrum transeuns, guld, lateribus capitis et cervicis, pectore et ventro medio saturate castaneis; rostro nigro, pedibus corneis. Long tota 5, ala $2 \cdot 6$, cauda 1.5 , tarsi 1.1 : forma typica.

Hab. Remedios, Antioquia (Salmon).
Mus. P. L. S.
A single specimen of this perfectly distinct species of Cyphorhinus was obtained at Remedios. Mr. Salmon notes "iris dark; food
insects." The simple coloration and absence of bars on the wings and tail readily distinguish this bird from its congeners.
12. Henicorhina leucophrys (Tsch.); Salvin, P. Z. S. 1870, p. 181.

Frontino. (Mus. S.-G.)
Food, insects.
Eggs (no. 64) either pure white or spotted with a few minute red spots: axis ${ }^{84}$, diam. $\cdot 6$.
13. Thryophilus nigricapillus (Scl.).

Thryothorus nigricapillus, Scl. P. Z. S. 1860, p. 84.
Remedios, Sta. Elena. (Mus. P.L.S. and S.-G.)
Iris dark. Food, insects.
A species of Western Ecuador.
"The nest is made of soft dry grass, and placed in a low bush." -T.K.S.
14. Thryothorus mystacalis, Scl. P. Z. S. 1860, p. 64.

Sta. Elena. (Mus. P. L. S. and S.-G.)
15. Thryothorus fasciativentris(Lafr.); Scl. et Salv. P.Z.S. 1864, p. 346.

Remedios, Neche. (Mus. S.-G.)
16. Troglodytes solstitialis, Scl. P. Z. S. 1858, p. 550.

Sta. Elena, Neche. (Mus. S.-G.)
Food, insects.
Eggs (no. 72) white, spotted with small red spots, but not nearly so profusely as those of the next species, which resemble the eggs of T. aëdon: axis ${ }^{6} 69$, diam. $\cdot 55$.
"This bird builds its nest in a bole in a wall or bank, or any convenient spot; it is made of soft blades of grass, and has a side entrance. The bird lays two eggs, white, thickly spotted with pale red."-T. K. S.
17. Troglodytes tessellatus (Lafr. et d'Orb.); Salvin, P. Z. S. 1867, p. 135.

Medellin, Concordia. (Mus. P. L. S. and S.-G.)
Eggs (no. 39) white, thickly freckled with red as in T. aëdon: axis $\cdot 77$, diam. 57 .

Fam. Mniotiltide.
18. Siurus noveboracensis (Gm.).

Concordia, Medellin. (Mus. P. L. S. and S.-G.)
Iris dark. Food, insects.
19. Mniotilta varia (Linn.).

Concurdia, Envigado, Sta. Elena. (Mus. S.-G.)
20. Protonotarla citrea (Bodd.).
(Mus. S.-G.)
21. Helminthophaga chrysoptera (Linĭı).

Sta. Elena. (Mus. S.-G.)
22. Helminthophaga peregrina (Wils.).

Concordia. (Mus. P. L. S.)
23. Dendreca blackburnie ( Gm .).

Concordia, Medellin, Sta. Elena, Remedios. (Mus. S.-G.)
24. Dendreca castanea (Wils.).

Remedios. (Mus. P. L. S. and S.-G.)
25. Dendreca cerulea (Wils.).

Medellin. (Mus. S.-G.)
26. Dendrecta estiva (Gm.).

Medellin. (Mus. S.-G.)
27. Geothlypis philadelphia (Wils.).

Sta. Elena, Medellin. (Mus. P. L. S. and S.-G.)
Iris dark. Food, insects.
23. Baslleuterus coronatus (Tsch.); Scl. P. Z.S. 1865, p. 284.

Sta. Elena. (Mus. P. L. S. and S.-G.)
Iris dark. Food, insects. Nest placed in a hole in a bank.
Eggs (no. 35) white, distinctly spotted with red: axis $\cdot 8$, diam. $\cdot 6$.
29. Basileuterus semicervinus, Scl. P. Z. S. 1860, p. 84, 1865, p. 286, pl. x. fig. 1.

Remedios, Neche. (Mus. P. L. S. and S.-G.)
Iris dark.
30. Basileuterus nigricristatus (Lafr.).

Trichas nigri-cristata, Lafr. R. Z. 1840, p. 230.
Sta. Elena. (Mus. S.-G.)
Food, insects.
Eggs (no. 70) white, spotted with red, sometimes with large red blotches: axis $\cdot 8$, diam, $\cdot 6$.
"The nest is placed in a hole in a bank, and built of dry grassblades, and lined with the same. The nest itself is perfectly cupshaped, and covered over the top with grass-blades. Those which I have seen contained ouly one egg, white, spotted rather thickly with small red spots."-T. K. S.
31. Setophaga ruticilla (Linn.).

Concordia, Medellin. (Mụs. S.-G.)
32. Setophaga verticalis, d'Orb. et. Lafr.; Salvin, Ibis, 1878, p. 311.

Concordia, Sta. Elena. (Mus. P. L. S. and S.-G.)
Food, insects.
Eggs (no. 68) white, spotted with red, especially at the larger end: axis $\cdot 72$, diam. $\cdot 78$. Nest open, made of dead leaves and fibres, and lined with fine fibres.
33. Setophaga chrysops, Salvin, Ibis, 1878, p. 314, pl. vii. fig. 2.

Retiro, Sta. Elena, Frontino. (Mus. P. L. S. and S.-G.)
Iris dark. Food, insects.
Eggs (no. 65) white, spotted with red, especially at the larger end: axis 7 , diam. 55. Nest open, made of dead leaves, coarse grass, and fibres, lined with finer fibres.

This species is practically a new discovery of Mr. Salmon's; for although Delattre had previously obtained an example near Popayan, Kaup determined Delattre's specimen as S. flaveola. Mr. Salvin's description and figure were based upon Mr. Salmon's specimens.

Fam. Vireonide.
34. Vireosylvia olivacea (Linm.).

Medellin, Remedios. (Mus. S.-G.)
35. Vireosylvia josephe, Scl.; Baird, Rev. A. B. p. 344.

Concordia, Medellin. (Mus. P. L. S. and S.-G.)
Iris dark. Food, insects.
36. Hylophilus semibrunneus, Lafr. R. Z. 1845, p. 341.

Concordia. (Mus. P.L.S.)
37. Cyclorhis nigrirostris, Lafr. R. Z. 1842, p. 133.

Sta. Elena. (Mus. P. L.S. and S.-G.)
Iris dark.
Fam. Hirundinida.
38. Progne chalybeia (Gm.) ; Scl. P. Z. S. 1872, p. 606.

Remedios. (Mus. P.L.S.)
39. Atticora cyanoleuca (Vieill.) ; Baird, Rev. A. B. p. 309.

Frontino. (Mus. S.-G.)
Iris dark. Food, insects.
Eggs (no. 89) white: axis $\cdot 77$, diam. $\cdot 5$.
40. Atticora tibialis (Cass.) ; Baird, Rev. A. B. p. 301.

Remedios. (Mus. S.-G.)
Iris dark.
"The nest is made of dry grasses, and placed in the hole of a bank."-T. K. S.
41. Stelgidopteryx uropygialis (Lawr.); Baird, Rev. A. B. D. 317.

Remedios. (Mus. S.-G.)
Iris dark. Food, insects.
Eggs (no. 100) white: axis 8 , diam. 57 .
Fam. Cerebide.
42. Diglossa sittoides (d'Orb. \& Lafr.); Sel. Ibis, 1875, p. 208.

Retiro, Concordia.
Iris dark. Food, insects.
43. Diglossa albilateralis, Lafr.; Scl. Ibis, 1875, p. 216, pl. v. figs. 1 and 2.

Iris dark. Food, insects.
Retiro, Medellin, Sta. Elena. (Mus. P. L.S. and S.-G.)
Eggs (no.56) greenish blue, thickly marked at the larger end with red-brown spots: axis $\cdot 72$, diam. $\cdot 51$. Nest open, made of moss, fibres, and rootlets, lined at the bottom with moss.
44. Diglossa brunneiventris, Lafr.; Scl. Ibis, 1875, p. 211.

Sta. Elena. (Mus. P.L.S. and S.-G.)
The occurrence of this Diglossa so far north is quite new to us; but we find no difference between Mr. Salmon's skins and Peruvian examples obtained by Jelski.
45. Diglossa personata (Fraser); Scl. Ibis, 1875, p. 218.

Retiro, Sta. Elena. (Mus. P.L.S. and S.-G.)
Iris red. Food, insects.
Eggs (see Plate XLII. fig. 1) pale greenish blue, thickly spotted with brown spots, especially at the larger end: axis 8 , diam. 6 . Nest open, made of dead grass, fibres, and a little moss, and lincd with feathers.
46. Diglossopis cerulfscens, Scl.; Ibis, 1875, p. 219.

Sta. Elena. (Mus. S.-G.)
Iris red. Food, fruit and insects. Builds in low bushes.
Eggs (no. 13) pale greenish blue, blotched with red-brown spots, chiefly at the larger end: axis $\cdot 75$, diam. $\cdot 57$. Nest open, made of moss, fibres, and dead grass, and lined with fine fibres.
47. Conirostrum albifrons, Lafr. R. Z. 1842, p. 301.

Sta. Elena, (Mus. S.-G.)
Iris dark. Food, insects.
48. Dacnis cayana (Lim.); Scl. Ibis, 1863, p. 313.

Remedios.
49. Dacnis ceerebicolor, Scl. Contr. Orn. 1851, p. 106, et Ibis, 1863, p. 314.

Remedios. (Mus. P. L. S.)
Iris dark.
The single (male) example is not quite so bright in colour as the typical specimen from Bogotá in Sclater's collection.
50. Dacnis egregia, Scl. P.Z.S. 1854, p. 251, et Ibis, 1863, p. 316 .

Remedios, Neche. (Mus. S.-G.)
51. Dacnis venusta, Lawr.; Scl. Ibis, 1863, p. 315.

Remedios. (Mus. S.-G.)
Iris dark. Food, fruit.
The extension of this species so far south is quite a new fact. Panama and Costa Rica are its previously known localities.

Besides these three species of Dacnis, Mr. Salmon sends a single skin from Remedios (Mus. P. L. S.), of what seems to be the female of an unknown member of this genus.
52. Chlorophanes atricapilla (Vieill.).

Concordia, Remedios. (Mus. S.-G.)
Iris dark. Food, fruit \&c.
53. Careba cerulea (Linn.).

Remedios, Medellin. (Mus. S.-G.)
Iris dark. Food, insects.
54. Certhiola mexicana, Scl.; Finsch, Verh. z.-b. Ges. in Wien, 1871, p. 772.

Remedios, Medellin. (Mus. S.-G.)
Iris dark. Food, insects.
Eggs (no. 50) dirty white, thickly spotted with red-brown, especially in a zone round the larger end : axis $\cdot 65$, diam. $\cdot 5$.
"The nest is made of fine dry grasses; it is oval-shaped, with a side entrance, and generally placed at the extremity of a bough, but not banging."-T. K. S.

Fam. Tanagride.
55. Procmias tersa (Linn.).

Procnias occidentalis, Scl. P. Z. S. 1854, p. 249, et nobis (passim). Remedios. (Mus. S.-G.)
Iris dark. Food, fruit and insects.
After comparing a number of specimens of Procnias from different localities, we have come to the conclusion that the grounds for keeping separate the western form are untenable. Salvin has already adopted this view (Ibis, 1879, p. 199).

Proc. Zool. Soc.-1879, No. XXXII.
56. Chlorophonia pretrii (Lafr.); Scl. Cat. A. B. p. 55.

Sta. Elena. (Mus. S.-G.)
Iris dark. Food, fruit.
57. Euphonia nigricollis (Vieill.); Scl. Cat. A. B. p. 56.

Medellin. (Mus. S.-G.)
Iris dark. Food, fruit.
58. Euphonia minuta (Cab.); Scl. Cat. A. B. p. 57.

Remedios. (Mus. S.-G.)
Iris dark.
59. Euphonia trinitatis, Strickl. Contr. Orn. 1851, p. 72.

Remedios. (Mus. P.L.S.)
We must refer Mr. Salmon's single skin to this species. It is rather larger and of a deeper violet on the back than typical specimens from "Trinidad" collections, and in the latter respect agrees with a specimen from Sta. Marta in Sclater's collection.
60. Euphonia xanthogastra, Sund.; Scl. P.Z. S.1856, p. 275.

Concordia. (Mus. S.-G.)
61. Euphonia fulvicrissa, Scl. P. Z. S. 1856, p. 276.

Remedios, Neche. (Mus. S.-G.)
Iris dark.
62. Chlorochrysa nitidissima, Scl. P. Z.S. 1873, p. 728, et Ibis, 1875, p. 466, pl. x.

This is one of the finest of Mr. Salmon's discoveries. Besides the original specimen (in Sclater's collection), Mr. Salmon has recently sent home another example from Jerico (Mus. S.-G.).

Mr. Ridgway writes that examples of this species have lately been received in the U.S. from Colombia, and are in his own and Mr. Lawrence's collection.
63. Diva vassori (Boiss.) ; Scl. P.Z.S. 1856, p. 264.

Sta. Elena. (Mus. S.-G.)
64. Calliste aurulenta (Lafr.); Scl. Mon. Call. p. 29, pl. xiv. fig. 2.

Concordia, Frontino. (Mus. P. L. S. and S.-G.)
Iris dark.
65. Calliste icterocephala (Bp.); Scl. l.c. pl. xvii.

Frontino. (Mus. S.-G.)
Iris dark.
66. Calliste vitriolina (Cab.); Scl. l.c. pl. xviii.

Medellin, Concordia. (Mus. S.-G.)
Food, fruit.
Eggs (no. 26) pale greenish, thickly spotted and blotched with
lilac-brown marks, especially in a zone round the larger end : axis $\cdot 89$, diam. $\cdot 61$. (See Plate XLII. fig. 2.) Nest open, made outwardly of moss, and lined with fine roots, fibres, and horsehair.
67. Calliste gyroloides (Lafr.) ; Scl. l.c. pl. axvi.

Concordia, Remedios. (Mus, P. L. S. and S.-G.)
Iris dark. Food, fruit.
68. Calliste ruficervix (Prév.); Scl. l.c. pl. xxxii.

Concordia. (Mus. S.-G.)
69. Calliste atricapilla (Lafr.) ; Sel. l.c. pl. xxxiii.

Retiro, Concordia, Frontino. (Mus. P. L. S. and S.-G.)
Iris dark. Food, fruit.
Eggs (no. 77) pale greenish, thickly spotted with dark red-brown spots, especially at the larger end: axis $\cdot 75$, diam. ${ }^{\circ} 61$.
70. Calliste nigriviridis (Lafr.); Scl. l.c. p. 76.
C. cyanescens, Scl. l.c. p. 79, pl. xxxp.

Sta. Elena, Envigado. (Mus. P. L. S. and S.-G.)
Iris dark. Food, insects.
Eggs (no. 91) pale greenish, thickly spotted and blotched with lilac-brown marks, especially in a zone round the larger end: axis $\cdot 82$, diam. $\cdot 58$.
71. Calliste inornata, Gould, P. Z. S. 1855, p. 158; Scl. l.c. pl. xlv.

Nichi. (Mus. P. L. S. and S.-G.)
Iris dark.
72. Calliste larvata, Du Bus; Scl. l.c. pl. xxxvi,

Remedios. (Mus. S.-G.)
Iris dark. Food, fruit.
The extension of this Central-American species so far south is new to us, and noteworthy. Its previously recorded range was from Tabasco to Panama.
73. Calliste cyaneicollis (Lafr. et d'Orb.); Scl. l.c. pl. xxxviii.

Concordia, Frontino. (Mus. P. L. S. and S.-G.)
Iris dark. Food, fruit.
74. Calliste labradorides (Boiss.); Scl. l.c. pl. xixis.

Concordia, Sta. Elena. (Mus. P.L.S. and S.-G.)
Iris dark. Food, fruit.
75. Calliste venusta, Scl. l.c. pl. xliv. fig. 2.

Frontino. (Mus. P. L. S. and S.-G.)
Iris dark. Food, fruit.
76. Iridornis dubusia, Bp.; Scl. P. Z. S. 1856, p. 244.

Sta. Elena. (Mus. S.-G.)
Iris dark. Food, fruit.
77. Iridornis porphyrocephala, Scl. P. Z. S. 1856, p. 243.

Medellin. (Mus. P. L. S. and S.-G.)
Iris dark. Food, fruit.
78. Pecilothraùpis palpebrosa (Lafr.).

Tanagra palpebrosa, Lafr. R. Z. 1847, p. 71.
Sta. Elena. (Mus. P. L. S. and S.-G.)
Iris dark.
Mr. Salmon's skins belong to the true $P$. palpebrosa of Colombia and Ecuador, and agree with Bogotá specimeus. P. lacrymosa of Peru is distiuct. (Cf. Cab. Journ. f. Orn. 1873, p. 317.)
79. Buthraupis cucullata (Jard.); Scl. P. Z. S. 1856, p. 239. Concordia. (Mus. S.-G.)
80. Compsocoma sumptuosa (Less.); Scl. P. Z. S. 1856, p. 238.

Retiro, Medellin, Sta. Elena. (Mus. P. L. S. and S.-G.)
Iris dark.
We are of opinion that C. cyanoptera, Cab. (Journ. f. Orn. 1866, p. 235), can hardly be maintained as distinct. One of Mr. Salmon's skins comes very near this form, having the edgings of the primaries almost as blue as the wing-coverts; others rather resemble the true C. sumptuosa. We likewise refer skins from Venezuela (Göring) to this species.
81. Dubusia tentiata (Boiss.) ; Scl. P.Z.S. 1856, p. 237.

Sta. Elena. (Mus. S.-G.)
We question the distinctness of $\boldsymbol{D}$. selysia, Bp., of Ecuador.
82. Tanagra cana, Sw.

Medellin. (Mus. S.-G.)
Iris dark. Food, fruit. Builds in orange-trees.
Eggs (no. 22) rich brown, densely blotched with darker spots, especially at the larger end: axis $\cdot 92$, diam. ${ }^{\circ} 68$.
83. Tanagra palmarum (Max.).

Remedios. (Mus. S.-G.)
Iris dark. Food, fruit.
Eggs (no. 92) pale whitish, very thickly freckled with red-brown spots : axis ${ }^{\prime} 95$, diam. $\cdot 65$.
"The nest is placed in the fork of a shrub or low tree, and formed of grass-stalks mixed with roots and fibres, lined, and ornamented on the outside, with green moss. I have never seen more than one egg, although I have examined many nests."-T. K.S.
84. Tanagra cyanocephala (d'Orb. et Lafr.)

Tanagra maximiliani, d'Orb. Voy. p. 276, pl. xxiii. fig. 2.
Retiro, Sta. Elena. (Mus. P. L. S. and S.-G.)
Iris dark. Food, fruit. Builds in high trees.
Eggs (no. 24) pale whitish, thickly blotched with spots of various sizes of red-brown: axis $1 \cdot 04$, diam. $\cdot 71$.

To this species should be united Tanagra auricrissa, Scl., of Bogotá, and T. subcinerea, Scl. (P. Z. S. 1861, p. 129), of Venezuela, as has been already done, Nomencl. p. 21. After comparing a large series, we find no sufficient grounds of separation.
85. Rhamphocelus dimidiatus (Lafr.); Scl. P.Z.S. 1856, p. 129.

Antioquia, Remedios, Neche. (Mus. S.-G.)
Iris dark red. Food, fruit.
Eggs (no. 94) pale greenish blue, spotted and streaked with large spots and fine lines of dark brown : axis $\cdot 91$, diam. $\cdot 65$.
"The nest is placed in low bushes, and is composed of small twigs, dead leaves, moss, and lichens."-T. K. S.
86. Rhamphocelus flammigerus (Jard.et Selb.); Scl. P.Z. S. 1856, p. 131.
Medellin. (Mus. P. L. S. and S.-G.)
Iris dark. Food, fruit. Builds in orange-trees and bushes.
Eggs (no. 20) pale greenish blue, sparsely spotted with large darkbrown spots and blotches: axis 1•05, diam. $\cdot 75$. (See Plate XLII. fig. 3.)
87. Rhamphocelus chrysonotus, Lafr.; Scl. P. Z.S. 1856, p. 131 .

This species was omitted from the "Nomenclator," but seems distinguishable from $R$. icteronotus and $R$. flammigerus, as already pointed out. Mr. Salmon's specimens (in his 8th collection) have no exact locality attached to them.
88. Rhamphocelus icteronotus, Bp.; Scl. P. Z. S. 1856, p. 131.

Remedios, Neche. (Mus. S.-G.)
Iris dark red. Food, fruit.
Eggs (no. 93) similar to those of R. flammigerus, but smaller : axis $1 \cdot 0$, diam. $7 \cdot 2$.
"The nest is made of small twigs, moss, and dead leaves, lined with fibrous roots, and is placed in low bushes, orange-trees, \&c. It varies very much in appearance, some being plain clumsy structures, whilst others are prettily ornamented with leaves and lichens."T. K. S.
89. Pyranga rubra (Linn.).

Remedios. (Mus. S.-G.)
Food, fruit.
90. Pyranga estiva (Gm.)

Concordia, Frontino. (Mus. S..G.)
Iris dark.
91. Pyranga testacea, Sci. et Salv. P. Z.S. 1868, p. 388.

Concordia, Medellin. (Mus. S.-G. and P. L. S.)
Mr. Salmon's skins appear to be referable to this Central-American form rather than to the Brazilian P. saira.
92. Pyranga rubriceps, Gray ; Scl. P. Z. S. 1856, p. 125.

Medellin, Sta. Elena. (Mus. S.-G. and P. L. S.)
Iris dark.
In the female of this species, of which Mr. Salmon has sent a single specimen (Mus. P.L. S.), the scarlet colour is confined to the summit of the head and the throat, instead of pervading the upper back and breast as in the male.
93. Orthogonys olivaceus, Cassin, Pr. Ac. Sc. Phil. 1860, p. 140, et ibid. 1864, pl. ii.

Remedios, Neche. (Mus. S.-G. and P.L. S.)
Iris dark. Food, fruit.
Mr. Salmon has sent home two skins of this remarkable biril, which upon the whole has, we think, been correctly assigned by Mr. Cassin to Orthogonys, though not quite typical in form. It has proportionally shorter wings and tail. Mr. Cassin's specimens were obtained during the Atrato Expedition on the river Truando. With this exception no other examples, so far as we are aware, are known.
94. Phenicothraupis gutturalis, Scl. Ann. Nat. Mist. xiii. p. 95 (1854); Wyatt, Ibis, 1871, p. 326.

Remedios. (Mus. P. L. S. and S.-G.)
Iris dark. Food, fruit.
Eggs (no. 96) pale greyish white, mottled, especially at the larger end, with red-brown and lilac spots: axis $1 \cdot 1$, diam. $\cdot 71$. (See Plate XLII. fig. 4.)
"The nest is cup-shaped, rather deep, and loosely made of coarse roots and fibres, lined with fine stalks, \&c. of ferns, and placed in low bushes by the side of mountain-streams." - T. K. S.
95. Phenicothraupis cristata, Lawrence, Ann. Lyc. N. H. New York, xi. p. 70 (1875).

Frontino. (Mus. P. L. S. and S.-G.)
Tris dark.
Two examples of this species, which, though like P. rubica and its allies in coloration, differs, as Mr. Lawrence remarks, in its well-developed crest.
96. Eucometis cassini (Lawr.).

Tachyphonus cassini, Lawr. Ann. L. N. Y. vii. p. 297.
Eucometis cassini, Scl. et Salv. P. Z. S. 1864, p. 351, pl xxx.; Salvin, P. Z. S. 1867, p. 139.

Neche. (Mus. S.-G.)
Iris dark. Food, froit \&c.
Mr. Salmon's skins agree with Central-American examples of this species, which had not been previously received from any place south of Panama.
97. Creurgops verticalis, Scl. P. Z. S. 1858, p. 72, pl. cxxii. Sta. Elena. (Mus. P. L. S. and S.-G.)
Mr. Salmon sends examples of both sexes of this little-known Tanager, originally described from a Rio-Napo skin. The female, hitherto undescribed, is rather smaller than the male, and has the vertical spot only faintly indicated.
98. Tachyphonus melaleucus (Sparm.) ; Scl. P. Z. S. 1856, p. 113.

Medellin, Remedios. (Mus.S.-G.)
Iris dark. Food, fruit. Builds in high grass.
Eggs (no. 19) pale salmon-colour with a few large isolated darkbrown spots : axis $1 \cdot 0$, diam. 71 . (See Plate XLII. fig. 5.)
99. Tachypionus luctuosus (Lafr. et d’Orb.) ; Scl. P. Z. S. 1856, p. 114.

Remedios, Neche. (Mus. S.-G.)
Iris dark. Food, fruit \&c.
100. Tacifyphonus xanthopygius, Scl. P.Z. S. 1856, p. 116.

Remedios. (Mus. S.-G. and P.L.S.)
Iris dark.
Originally described from Bogotá skins, but extends north to Panama (P. Z. S. 1864, p. 351).
101. Tachyphonus delattrii (Lafr.); Scl. et Salv. Ex. Orn. p. 67 , pl. $x x x i v$.

Remedios, Neche. (Mus. S.-G. and P. L. S.)
Iris dark. Food, fruit.
102. Nemosia albigularis, Scl. P. Z. S. 1855, p. 109, pl. xcix.

Remedios. (Mus. S.-G.)
Iris dark.
Agrees with Bogotá skins.
103. Chlorospingus flavipectus (Lafr.) ; Scl. P.Z. S. 1856, p. 90 .

Retiro, Concordia, Sta. Elena. (Mus. P. L. S. and S.-G.)
Iris white. Food, fruit \&c.

Eggs (no. 53) white, spotted, with pale red spots : axis 82 , diam. -63. (See Plate XLII. fig. 6.)
104. Chlorospingus atripileus (Lafr.) ; Scl. P.Z.S. 1856, p. 91.

Mpdellin, Sta. Elena. (Mus. S.-G.)
105. Chlorospingus rubrirostris (Lafr.) ; Scl. P. Z. S.1856, p. 92 .

Sta. Elena. (Mus. S.-G.)
Eggs (no. 15) pale greenish white, spotted thickly at the larger end with reddish lilac: axis 91, diam. $\cdot 68$.
106. Chlorospingus ignobilis (Scl.): Scl. et Salv. P. Z. S. 1870, p. 784.

Sta. Elena. (Mus. S.-G.)
107. Chlorospingus verticalis (Lafr.) ; Scl. P. Z. S. 1856, p. 93 .

A single skin in Mr. Salmon's sixth collection without exact locality. (Mus. S.-G.)
108. Buarremon assimilis (Boiss.) ; Scl. P. Z. S. 1856, p. 85. Medellin, Sta. Elena. (Mus. S.-G.)
109. Buarremon brunneinuchus (Lafr.) ; Scl. P. Z. S. 1856, p. 85 .

Concordia, Medellin, Sta. Elena. (Mus. S.-G.)
Eggs (no. 34) nearly white, faintly tinged with very pale greenish blue: axis $1 \cdot 4$, diam. $7^{\circ} 6$.
110. Buarremon gutturalis (Lafr.).
B. chrysopogon et B. gutturalis, Scl. P. Z. S. 1856, p. 86.
B. gutturalis, Salv. Ibis, 1874, p. 122.

Medellin, Remedios. (Mus. S.-G.)
Eggs (no. 21) very pale greenish blue : axis $1 \cdot 0$, diam. $\cdot \%$.
111. Buarremon eleoprorus, sp. nov.

Supra obscure olivaceus, subnigricans; pileo rufo-castaneo; capitis
lateribus nigris; lororum macula parva flava; alis caudaque
nigris; speculo alari albo; subtus late flavus; lateribus et
crisso in olivaceum transeuntibus; rostro corneo, pedibus cory-
linis. Long. tota $7 \cdot 0$, alce $2 \cdot 8$, caudac $3 \cdot 0$.
Hab. Medellin et Sta. Elena in Statu Antioquiæ reipubl. Colombianæ.

Mus. S.-G天. et P. L. S.
Obs. Aff. B. latinuche ex Peruviâ, sed maculâ lororum flavâ et colore dorsi olivaceo nec nigro distinguendus.

Iris dark ; fruit in stomach.
Eggs (no. 36) reddish white, spotted and blotched with red and pale reddish lilac: axis 95 , diam. $\cdot 7$. (See Plate XLII. fig. 7.)
112. Buarremon castaneiceps, Scl. P. Z. S. 1859, p. 441, et 1860, p. 86.

Frontino. (Mus. S.-G.)
Eggs (no. 79) white, thickly spotted at the larger end with red: axis $1 \cdot 4$, diam. $\cdot 75$.
113. Arremon spectabilis, Scl. P. Z. S. 1854, p. 114, pl. lxvii.
A. spectabilis et A. erythrorhynchus, Scl. P. Z. S. 1856, pp. 82, 83, et Cat. A. B. p. 93.

Remedios. (Mus. P. L. S. and S.-G.)
This species extends from Eastern Peru through Ecuador into Colombia. A. erythrorhynchus, founded on Bogotá skins, is, we believe, identical.
114. Psittospiza riefferi (Boiss.) ; Scl. P. Z. S. 1856, p. 78.

Euvigado, Concordia, Medellin, Remedios, Sta. Elena. (Mus. P. L. S. and S.-G.)

Eggs (no 61) pale grey, thickly freckled with lilac-grey spots : axis $1 \cdot 2$, diam. ${ }^{\circ} 82$. (See Plate XLII. fig. 8.)
"This bird builds a nest of considerable size, made of green moss, lined thickly within, and on the outside prettily oruamented with long tapering green ferns. I have seen but one egg in a nest, but cannot speak positively as to the number generally laid."-T. K. S.
115. Saltator magnus (Gm.) ; Scl. P. Z. S. 1856, p. 70.

Remedios, Medellin, Neche. (Mus. S.-G.)
Iris dark.
Eggs (no. 97) pale greenish blue, with a zone of black spots and hair-lines round the larger end : axis $1 \cdot 13$, diam. $\cdot 78$.
"The nest is composed of small sticks and fern-stalks, and placed in low underwood."-T. K. S.
116. Saltator atripennis, Scl. Cat. A. B. p. 95.

Medellin. (Mus. P. L. S. and S.-G.)
Iris dark. Stomach contained fruit.
117. Saltator albicollis, Vieill. ; Scl. P. Z. S. 1856, p. 73.

Medellin, Remedios, Sta. Elena. (Mus. S.-G.)
Eggs (no. 25) pale greenish blue, with a zone of fine black lines round the larger end : axis $l^{\circ} \cdot$, diam. $\cdot 7$. (See Plate XLII. fig. 9.)
118. Orchesticus ater (Gm.); Scl. P.Z.S. 1856, p. 67.

A skin in the eighth collection without exact locality. (Mus. S.-G.)
119. Pitylus grossus (Linn.) ; Scl. P. Z. S. 1856, p. 64.

Remedios, Neche. (Mus. S.-G.)

## Fam. Fringillide.

## 120. Hedymeles ludovicianus (Linn).

Several examples without exact localities. This northern species also occurs in Bogotá collections. (Mus. S.-G.)
121. Guiraca cyanoides (Lafr.) ; Scl. et Salv. P. Z. S. 1864, p. 352.

Remedios. (Mus. S.-G.)
122. Oryzoborus occidentalis, Scl. P. Z. S. 1860, p. 276.

Medellin. (Mus. S.-G.)
Iris dark. Seeds in stomach.
To this form of $O$. crassirostris Bogotá skins must also be referred.
Eggs (no. 12) greyish brown, indistinctly blotched with lilac-grey, and strongly marked with dark red-brown marks: axis $\cdot 93$, diam. $\cdot 6$.
" Not a common bird here. I have seen but one nest, which was built in a low bush in a wild swampy place. It was constructed of the stems of coarse grass, lined with a finer kind, and contained two eggs mottled over with light brown with a few irregular blots and dashes of a darker colour. The female was sitting, and the male perched on a bush at a short distance."-T. K. S.

## 123. Oryzoborus funereus, Scl.

Oryzoborus funereus, Scl. P. Z. S. 1859, p. 278, et O. athiops, Scl. P. Z. S. 1860, p. 88.

Medellin. (Mus. S.-G.)
Iris dark. Food, seeds.
Eggs (no. 5) greenish white, thickly marked with brown spots, especially at the larger end: axis $\cdot 73$, diam. $\cdot 55$.

In our 'Nomenclator' we have united these two species of Sclater's, of which the former was founded on Mexican, the latter on Ecuadorian skins. The points of difference given when the latter was described do not hold when a series is compared; and the species must be regarded as extending from Southern Mexico through Central America into Colombia and Ecuador.
"A not uncommon bird in wild uncultirated places, where it makes its nest in low bushes, very slight in structure, of dry grass, and lays two eggs, mottled over with brown of different shades, and a few spots of a darker colour."-T. K. S.
124. Spermophila minuta (Linn.); Scl. Ibis, 1871, p. 3.

Retiro, Medellin. (Mus. S.-G.)
Iris dark. Food, seeds.
Eggs (no. 9) white, clearly marked with several shades of rich redbrown spots : axis $\cdot 65$, diam. $\cdot 51$.
"Builds in low bushes much the same sort of nest as S. gutturalis, but of coarser grass." $-T . K$. S.
125. Spermophila luctuosa, Lafr.; Scl. Ibis, 1871, p. 15. Medellin. (Mus. S..G.)
126. Spermophila gutturalis (Licht.); Scl. Ibis, 1871, p. 15.

Medellin, Envigado. (Mus. S.-G.)
Iris dark. Stomach contained seeds. Nests in low bushes.
Eggs (no. 8) pale greenish white, marked with large blotches of several shades of rich brown: axis $\cdot 7$, diam. ${ }^{\circ} 5$.
"The nest is built at a height of four or five feet, of stems of dry grass rather loosely put together, in which two eggs are laid."T. K. S.
127. Spermophila grisea (Gm.) ; Scl. Ibis, 1871, p. 18.

Envigado, Medellin. (Mus. P. L. S. and S.-G.)
128. Catamblyrhynchus diadema, Lafr. Rev. Zool. I842, p. 301 .

Sta. Elena. (Mus. S.-G.)
129. Volatinia jacarina (Linn.); Scl. Cat. A. B. p. 106.

Medellin. (Mus. S.-G.)
Iris dark; stomach contained seeds; nests on the ground.
Eggs (no. 7) white, spotted with red, chiefly in a zone round the larger end : axis $\cdot 7$, diam. $\cdot 55$.
"This nest is carefully concealed very close to or upon the ground amongst grass or herbage in waste places. It is slightly constructed of dry grass stems, lined with hair, or sometimes with the stems of a small flowering plant.
"The eggs are two in number, pale bluish white, spotted with red brown."-T. K. S.
130. Phonipara pusilla, Sw.; Scl. Cat. A. B. p. 106.

Retiro, Sta. Elena, Medellin. (Mus. S.-G.)
Iris dark.
Eggs (no. 41) white, marked, especially at the larger end, with brown spots: axis $\cdot 68$, diam. ${ }^{\circ} 51$.
131. Zonotrichia pileata (Bodd.) ; Scl. Cat. A. B. p. 113.

Retiro, Envigado, Medellin. (Mus. S.-G.)
Iris dark. Nests in low bushes.
Eggs (no. 14) pale bluish green, thickly freckled with red spots : axis $\cdot 85$, diam. ${ }^{6} 65$.
132. Emberizoides macrurus (Gm.); Scl. Cat. A. B. p. 118.

Antioquia, Medellin. (Mus. S.-G.)
Iris dark; stomach contained insects ; nests in high grass.
Eggs (no. 23) white, sparingly spotted and streaked with black, chiefly at the larger end: axis ${ }^{\prime} 95$, diam. ${ }^{\prime} 69$.

## 133. Euspiza americana (Gm.)

No exact locality given. (Mus. S.-G.)
This northern species also occurs in Bogotá collections.
134. Cerysomitris columbiana (Lafr.); Scl. Cat. A. B. p. 124.

Concordia, Retiro, Sta. Elena, Medellin. (Mus. S.-G.)
Eggs (no.4) pale greenish white: axis $\cdot 65$, diam. 45.
"This species builds a pretty nest, often artfully placed on the branch of a fruit-tree. It is composed externally of dried grass intermixed with moss, cotton, and lichen ; sometimes the cotton abounds: it is very carefully finished and delicately lined with hair. The eggs are three in number, white, slightly tinged with blue, without any spots. It breeds in June and July, and is a very common bird. The young first assume the plumage of the female; and after the breeding-season they are generally seen in flocks of ten or twelve."-T. K. S.
135. Chrysomitris xanthogastra, Du Bus; Scl. et Salv. P. Z. S. 1870, p. 785.

Sta. Elena. (Mus. S.-G.)
This Siskin is widely distributed, extending from Costa Rica into Bolivia. It occurs in Bogotá collections.

Eggs (no. 10) pale greenish white, thickly but faintly freckled with lilac and brownish spots: axis $\cdot 7$, diam. $\cdot 5$.

Fam. Icteride.
136. Ocyalus wagleri (Gray \& Mitch.); Scl. Cat. A. B. p. 127.

Pocune, Remedios. (Mus. S.-G.)
Iris blue.
Eggs (no. 150) pale greenish white, blotched with sepia spots of various sizes : axis $1 \cdot 3$, diam. ${ }^{8} 88$. (Plate XLIII. fig. 3.)
137. Ostinops decumanus (Pall.) ; Salvin, Ibis, 1879, p. 200.

Remedios. (Mus. S.-G.)
Iris blue.
Eggs (no. 149) pale greenish blue, sparsely spotted with darkbrown spots : axis $1 \cdot 3$, diam. 1 .
138. Ostinops guatemozinus, Bp. Compt. Rend. xxxviii. p. 833, et Notes s. 1. Coll. Delattre, p. 10 (1853); Cassin, Pr. Acad. Phil. 1860, p. 138; Scl. et Salv. Nomencl. p. 35.

Remedios. (Mus. P. L. S. and S.-G.)
Iris blue.
Eggs (no. 148) pale pinkish white, sparsely spotted with large red-brown spots: axis $1 \cdot 3$, diam. 1 .

These are the first specimens we have ever seen of this fine species, except the type in the Paris Museum and the specimen in Washing-
ton. It is of the size and structure of $O$. montezuma, from which, and from O. bifasciatus Mr. Cassin has accurately pointed out its differences in a footnote (op. cit. p. 138).

The Paris specimen is from the Magdalena valley (Fontanier), that of Cassin from the river Truando ( $W$ ood ).
139. Ostinops atrocastaneus, Cab. Journ. f. O. 1873, p. 309.

Envigado, Concordia, Frontino. (Mus. P. L. S. and S.-G.)
Iris red.
Eggs (no. 113) reddish salmon-colour, blotched and spotted with large burnt-sienna spots chiefly at the larger end. In some specimens the spots are smaller and darker; in others the ground-colour is much darker and the spots paler and more diffused : axis $1 \cdot 46$, diam. 1.05. (See Plate XLIII. figs. 1, 2.)

Dr. Cabanis has, we think, fairly distinguished this form from the allied O. atrovirens. Specimens from Ecuador (O. atrovirens, Scl. P. Z. S. 1859, p. 140, et 1860, p. 88, nee d'Orb.) are apparently similar ; but the Bogotá bird (O. sincipitalis, Cab. l. c.) is not quite so darkly coloured, although nearer the present form than to the southern O. atrovirens.
140. Cassicus flavicrissus, Scl. P. Z. S. 1860, p. 276.

Remedios. (Mus. S.-G.)
Iris blue.
Eggs (no. 151) white, sparingly spotted with dark brown, chiefly at the larger end: axis $1 \cdot 2$, diam. $\cdot 8$.
141. Cassicus uropygialis, Lafr. R. Z. 1843, p. 290.

Jerico. (Mus, S.-G.)
142. Cassicus leucorhamphus (Bp.); Scl. Cat. A. B. p. 129.

Envigado, Concordia, Sta. Elena. (Mus. S.-G.)
Iris dark.
143. Icterus giraudi, Cassin ; Scl. Cat. A. B. p. 133.

Envigado, Concordia, Medellin. (Mus. S.-G.)
Insects and fruit in stomach.
Eggs (no. 66) pale grey, blotched and streaked with dark brown and grey: axis $1 \cdot 15$, diam. $\cdot 72$.
144. Icterus mesomelas, Wagl. ; Scl. Cat. A. B. p. 133.

Neche.
145. Dolichonyx oryzivorus (Linn.)

Medellin.
146. Molothrus discolor (Vieill.) ; Cassin, Pr. Acad. Sc. Phil. 1866, p. 20 ; Scl. et Salv. Nomencl. p. 37.

Concordia, Medellin, Sta. Elena. '(Mus. P. L. S. and S.-G.)
Eggs (no. 46) pinkish white, thickly freckled with red, especially at the larger end : axis 1 , diam. 8 .

We refer Mr. Salmon's skins to the large form of M. bonariensis thus determined by Cassin. M. atronitens, Cab., of Guiana, is not the same, as supposed by Cassin, but a smaller species, of the same size as M. bonariensis.
147. Hypopyrrhus pyrrhogaster (De Tarr.) ; Bp. Consp. p. 425.

Envigado, Sta. Elena. (Mus. P. L. S. and S.-G.)
Iris white.
Eggs (no. 121) pale greenish grey, spotted and streaked with lilac and dark brown: axis $1 \cdot 22$, diam. $\cdot 82$. (See Plate XLIII. fig. 4.)
"A restless bird, seldom seen alone, but in small parties of six or eight. In the breeding-season, however, its habits are solitary. The nest is composed of large dead leaves and sticks, and is placed loosely in the fork of a small tree."-T. K. S.
148. Cassidiy oryzivora (Lim.) ; Scl. Cat. A. B. p. 142.

Concordia, Antioquia, Remedios.
Iris white.
Eggs (no. 152) white: axis $1 \cdot 45$ and $1 \cdot 15$, diam. $\cdot 93$ and $\cdot 86$.
There is a remarkable difference in the size of the two eggs sent of this species.
149. Cyanocorax incas (Bodd.)

Xanthura yncas, Sharpe, Cat. B. iii. p. 129.
Xanthura incas, Scl. Ibis, 1879, p. 87.
Retiro, Concordia, Sta. Elena. (Mus. P. L. S. and S.-G.).
Iris yellow.
Mr. Salmon's skins have the head quite white, and belong to the typical form from Ecuador and Peru.

Eggs (no. 120) greenish grey, thickly mottled with darker shades of the same colour : axis $1 \cdot 15$, diam. $\cdot 85$.
"Has much the habits of the English Jay, being ever on the move and seldom silent, except when near its nest or when at mischief. It robs the Indian corn-fields before the grain is ripe, but at other times subsists on grubs and insects. The nest is made of sticks and roots, and is placed in a high bush. The number of eggs is four."-T. K. S.
150. Cyanocorax affinis, Pelzeln; Scl. Cat. A. B. p. 45 ; Sharpe, Cat. iii. p. 121.

Cauca, Remedios. (Mus. S.-G.)
Iris yellow.
Eggs (no. 159) clay-brown, thickly spotted, especially at the larger end, with spots of several shades of yellowish brown: axis $\mathrm{I} \cdot 35$, diam. $\cdot 97$.
"The nest is composed of sticks; and all I have seen have been placed with considerable skill in places difficult to find, generally a good way out on a branch. Though a noisy bird at all other times, it is usually quiet when near its nest."-T. K. S.

Fam. Tyrannide.
151. Myiotheretes striaticollis (Scl.), Cat. A. B. p. 197.

Mus. S.-G.
One example in the sixth collection.
152. Ochthodieta fumigata (Boiss.).

Octhocca fumigata, Scl. Cat. p. 198.
Sta. Elena, (Mus. S.-G.)
Iris dark.
153. Ochthecta fumicolor (Scl.), Cat. A. B. p. 198.

Sta. Elena. (Mus. S.-G.)
Iris dark. Food, insects.
Eggs (no. 51) white, with a few small red-brown spots: axis $\cdot 75$, diam, $\cdot 6$.

15̄4. Ochtheca lessoni (Scl.), Cat. A. B. p. 198.
Sta. Helena. (Mus. S.-G.)
Iris dark. Food, insects.
155. Ochtheca cinnamomeiventris (Lafr.) ; Scl. Cat. A. B. p. 199.

Envigado and Sta. Helena. (Mus. S.-G.)
Iris dark. Food, insects.
Eggs (no. 58) white with large red spots, chiefly near the larger end: axis $\cdot 77$, diam. $\cdot 55$.
156. Ochtheca diadema (Hartl.); Scl. \& Salv. Nomencl. p. 42.

Mecocerculus diadema, Scl. Cat. p. 199.
Sta. Helena. (Mus. S.-G.)
Iris dark. Food, insects.
Eggs (no. 73) white: axis 7 , diam. $\cdot 54$.
"The nest is made entirely of moss lined with a few feathers, and is built in a bank, generally into a mass of growing moss. The bird lays four cream-white eggs."-T. K. S.
157. Sayornis cineracea (Lafr.); Scl. et Salv. Nomencl. p. 43.
S. cineracea et $S$. latirostris, Scl. Cat. p. 200.

Medellin, Frontino. (Mus. P. L. S. and S.-G.)
Eggs (no. 81) white: axis $\cdot 8$, diam. ${ }^{\circ} 6$.
After comparing skins from Venezuela, Colombia, and Ecuador, we have come to the conclusion that they are all referable to one species; so that Sclater's S. latirostris, founded on specimens from the last locality, must be suppressed.
158. Copurus leuconotus, Lafr.; Scl. Cat. A. B. p. 204.

Remedios. (Mus. S.-G.)
159. Todirostrum cinereum (Linn.); Scl. Cat. A. B. p. 207.

Medellin, Sta. Elena, Remedios. (Mus. S.-G.)
Iris white. Insects in stomach.
Eggs (no. 83) white : axis ${ }^{\prime} 64$, diam. $\cdot 49$.
160. Todirostrum ruficeps, Kaup ; Scl. Cat. A. B. p. 207.

Frontino. (Mus. S.-G.)
Iris dark. Stomach contained insects.
Eggs (no. 90) white, with a few very pale red spots: axis $\cdot 63$. diam. 48.
161. Euscarthmus granadensis (Hartl.): Scl. Cat. A. B. p. 209.

Retiro, Envigado, Sta. Elena. (Mus. P. L. S. and S.-G.)
162. Hapalocercus acutipennis, Scl. et Salv. P. Z. S. 1873, p. 187.

Medellin. (Mus. S.-G.)
Iris dark.
163. Serphophaga cinerea (Strickl.) ; Scl. Cat. A. B. p. 211.

Envigado, Frontino. (Mus. P.L.S. and S.-G.)
Eggs (no. 84) creamy white : axis $\cdot 64$, diam. $\cdot 5$.
164. Mionectes striaticollis (Lafr. et d'Orb.); Scl. Cat. A. B. p. 213.

Sta. Elena. (Mus. S.-G.)
Insects in stomach.

- Eggs (no. 71) white : axis ${ }^{8}$, diam. ${ }^{\circ} 6$.

165. Mionectes oleagineus (Licht.); Scl. Cat. A. B. p. 213.

Remedios.
Insects in stomach.
166. Leptopogon erythrops, Scl. P. Z. S. 1862, p. 112.

Sta. Elena, Medellin. (Mus. S.-G.)
Mr. Salmon's skins agree with the typical specimens from Bogotá in Sclater's collection.
167. Leptopogon pacilotis, Scl. P.Z.S. 1862, p. 111.

Concordia. (Mus. P. L. S.)
168. Tyrannulus elatus (Lath.); Scl. Cat. A. B. p. 215.

Remedios. (Mus. S.-G.)
169. Tyranniscus nigricapillus (Lafr.) ; Scl. Cat. A. B. p. 213.

Sta. Elena. (Mus. S.-G.)
Iris dark. Stomach contained insects.
170. Tyranniscus chrysors, Scl. P. Z. S. 1870, p. 842.

Retiro, Concordia, Sta. Elena. (Mus. P. L. S.)
171. Elainea pagana (Linn.) ; Scl. P.Z. S. 1870, p. 834.

Medellin. (Mus. P.L. S. and S.-G.)
Mr. Salmon sends us examples, with their eggs, of what he considers two different species; but both of them we refer to E.pagana.

Eggs (no. 1) pale salmon-colour, with a zone of several shades of red spots round the larger end: axis $\cdot 82$, diam. $\cdot 65$.

Eggs (no. 2) smaller, and less spotted: axis $\cdot 72$, diam. $\cdot 58$.
Mr. Salmon's notes on these two forms are as follows:-
"No. 1 builds a similar nest to the Cardinal, but larger, of dried grass, prettily ornamented on the outside with pieces of bark and white lichen, lined with feathers; and the situation also is the same. The eggs, two in number, are white, spotted at the larger end with grey and rust-brown, generally extending in a ring round the egg.
"The bird is easily distinguished from all others by its harsh cry : and it is more restless than any others of the family; it does not sit silently waiting for its prey, but is continually moving about.
"No. 2. The nest of this bird is built of coarse dry grass, lined with finer grass and, generally, with any moss or lichen. It is placed upon a horizontal bough near the extremity, at a normal height. The eggs are only two in number, cream-white, spotted at the larger end with small specks of purple and rust-red, often forming a ring."
172. Elainea frantzif, Lawrence, Ann. L. N. Y. vii. p. 173.

Elainea pudica, Scl. P. Z. S. 1870, p. 833.
Medellin, Sta. Elena. (Mus. P.L.S. and S.-G.)
Iris dark. Food, insects. Nests on low branches.
Eggs (no. 17) white, with a few small red spots near the larger end : axis 77 , diam. ${ }^{5} 59$.

Having now received typical specimens of $E$. frantzii, we find that this Costa-Rican bird is not different from Sclater's $E$. pudica of Veragua and Colombia.
173. Myiozetetes texensis (Giraud); Scl. P.Z.S. 1871, p. 753.

Envigado, Medellin.
Iris dark. Fruit in stomach.
Eggs (no. 37) white, spotted, especially at the larger end, with red : axis ${ }^{-82}$, diam. $\cdot 62$.
174. Rhynchocyclus fulvipectus, Scl. P. Z. S. 1876, p. 92.

Frontino. (Mus. S.-G.)
Stomach contained insects.
Eggs (no. 82) white, with an indistinct zone of small very pale red spots: axis $\cdot 95$, diam. $\cdot 68$.

Originally described from Ecuador specimens (Fraser), but also occurring in Bogotá collections. (Mus. S.-G.)

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175. Myiodynastes audax (Gm.).

Sta. Elena, Frontino. (Mus. S.-G.)
Iris dark.
"The nest is made of fern-stalks and twigs, and is placed in the fork of a tree or high bush. The eggs are two, white, spotted with red."'-T. K. S.
176. Myiodynastes chrysocephalus (Tsch.); Scl. Cat. A. B. p. 223.

Concordia. (Mus. P. L. S. and S.-G.)
177. Cnipodectes subbrunneus (Scl.); Scl. et Salv. P. Z. S. 1873, p. 281.

Remedios. (Mus. S.-G.)
Iris dark.
178. Myiobius barbatus (Gm.).
M. barbatus et M. xanthopygius, Scl. Cat. A. B. p. 225.

Sta. Elena. (Mus. S. G.)
Under the name of M. barbatus we are now disposed to unite the Brazilian and more northern forms kept separate in Sclater's Catalogue. The Panama bird, M. atricaudus, Lawrence (Ibis, 1863, p. 183) is hardly different.
179. Myiobius villosus, Scl. P. Z. S. 1860, pp. 93, 465.

Frontino.
In our ' Nomenclator' we have united this species to the CentralAmerican form M. sulphureipygius, but are now inclined to recognize it as distinct, though very closely allied.
180. Myiobius cinnamomeus (Lafr. et d’Orb.) ; Scl. Cat. A. B. p. 226.

Concordia, Sta. Elena. (Mus. S.-G.)
Mr. Salmon's skins agree with specimens from Bogotá and Ecuador.
181. Myioblus flavicans, Scl. P. Z. S. 1860, p. 464.

Sta. Elena. (Mus S.-G.).
Iris dark ; food, insects.
Mr. Salmon's skins agree with specimens from Ecuador and Bogotá. (Mus. P. L. S.)
182. Myiobius nevius (Bodd.); Scl. Cat. A. B. p. 227.

Medellin. Food, insects ; nests on low branches of trees.
Eggs (no.16) salmon-colour, with large red blotches near the larger end : axis 65 , diam. $\cdot 5$.
"At the extremity of the horizontal branch of a tree I have seen this nest beautifully constructed of coarse grass interwoven like basketwork with other materials, as moss and leaves. The body of the nest is formed of very long grass, which is carried along the
branch for several inches, twisted round and fixed in a very clever manner, as though the bird was afraid it would slip from the end of the bough and fall. The nests which I have seen have always been deep, I suppose to prevent the eggs from falling out when the wind blows, which would of course cause a considerable motion on accoun $t$ of the position in which they are placed. They were also well sheltered from the rain from the leaves above. The eggs are creamcolour with a few rust-coloured spots at the larger end."-T. K. S.
183. Pyrocephalus rubineus (Bodd.); Scl. Cat. A. B. p. 227.

Medellin. (Mus. S.-G.).
Iris dark; food, insects; nests on low trees and shrubs.
Eggs (no. 3) creamy white, with a conspicuous zone round the middle of large red-brown and lilac spots: axis $\cdot 72$, diam. $\cdot 57$.
" This bird builds a pretty nest, the body of which is composed of dry grass, completely covered on the outside with lichen, and lined with feathers.
"The nest is generally placed on an out-spreading branch, and securely attached to the supporting stem by pieces of lichen and bark. It would be often difficult to discover, were it not that the male bird is generally perched silently on a tree or bush near, his beautiful crimson colour forming a conspicuous object amongst the green leaves.
"The female lays two eggs, with a ring of grey and sepia-brown blotches intermixed at the larger end."-T. $K . S$.
184. Empidochanes feecilurus, Scl. P. Z. S. 1862, p. 112.

One example, without exact locality, agreeing with the type in Mr. Sclater's collection. (Mus. S-G.)
185. Contopus ardesiacus (Lafr.); Scl. et Salv. Nomencl. p. 52 .

Medellin and Sta. Elena. (Mus. P. L. S.).
186. Myiarchus tyrannulus (Müll.) ; Scl. et Salv. Nomencl. p. 52.

Myiarchus ferox auctt.
Retiro, Concordia, Sta. Elena.
Iris dark ; food, insects; builds in hollow trees.
Eggs (no. 33) creamy-white, thickly streaked with longitudinal streaks of red-brown and a ferw large lilac blotches near the larger end: axis $\cdot 9$, diam. $\cdot 7$. (Mus. Brit.)
187. Tyrannus pipiri (Vieill.) ; Scl. Cat. A. B. p. 236.

Medellin.
Iris dark.
This northern species descends to the Amazons (P. Z. S. 1866, p. 189) and Bolivia ( $d^{\prime}$ Orb.). It also occurs in Bogotá collections. (Mus. P. L. S.)
188. Tyrannus melancholicus (Vieill.); Scl. Cat. A. B. p. 235.

Retiro, Medellin.
Iris dark ; food, insects ; builds in trees.
Eggs (no. 27) pale salmon-colour, spotted, especially in a zone round the larger end, with red-brown, red, and lilac spots: axis $1 \cdot 0$, diam. $\%$. (Mus, Brit.)
"The nest of this bird is built upon a spreading branch near the top of low trees; it is made of small twigs lined with black dry fibrous roots, and is generally a slight structure. The eggs, two in number, are white tinged with pink, and spotted, mostly at the larger end, with blood-red. In Tierra Fria it breeds in the months of March and April, in Tierra Caliente in May and June. The young resemble the old ones, with the exception of the orange-coloured feathers on the head. It is a noisy, quarrelsome bird, continually attacking and driving away all intruders from its domain."-T. $K . S$.

## 189. Milyulus tyrannus (Linn.).

Retiro, Medellin.
Eggs (no. 55) creamy white, spotted with distinct spots of dark red, especially at the larger end; axis $\cdot 9$, diam. $\cdot 65$. (Mus. Brit.)
"This species builds its nest on the spreading branches of trees, generally at no great height, making it of grass-stalks, roots, and fibres, intermixed with cotton, silk and a variety of other substances; sometimes it is lined with dry roots, at others entirely with grass. The male is almost invariably perched on some conspicuous branch while the female is sitting. Builds always in the open country, never in the forest."-T. K. S.

## Fam. Pipride.

190. Masius coronulatus, Scl. P. Z.S. 1860, p. 91, et Cat. A. B. p. 247, pl. xix.

In 1875 Mr Salmon sent home a single skin of the male of this form, now in Sclater's collection. It differs from typical examples from Ecuador in having the thick flattened horny ends of the feathers which terminate the crest of a pale brown instead of a red colour ; but we are not inclined to separate the form specifically on the faith of this single specimen.
191. Chloropipo flavicapilla (Scl.), Cat. A. B. p. 247.

Medellin. (Mus. S.-G.)
Mr. Salmon's specimens differ from Bogotá skins in having the yellow of the upper surface confined to the crown and nape, the back and cheeks being olivaceous; otherwise the birds agree, and are hardly separable specifically.
192. Pipra auricapilla, Licht.; Scl. Cat. p. 249.

Remedios and Neche. (Mus. S.-G.)
lris white.
193. Pipra cyaneocapilla, Hahn; Scl. Cat. p. 249.

Medellin, Remedios, and Neche. (Mus. S.-G.)
Iris dark.
194. Macheropterus striolatus(Bp.); Scl. Ibis, 1862, p. 176.

Medellin, Remedios, and Neche. (Mus. S.-G.)
Iris dark.
195. Chiromacheris manacus (Linn.); Scl. Cat. p. 252.

Remedios and Neche. (Mus. Brit.)
Iris red.
Eggs (no. 155) reddish white, thickly blotched with longitudinal blotches of dull red, the blotches being almost confluent in a zone round the larger end : axis ${ }^{\circ} 82$, diam. $\cdot 6$. (See Plate XLII. fig. 11.)
"Builds a slight shallow nest of grasses, which is suspended from the fork of a branch in low shrubs."-T. K. S.
196. Chiromacheris vitellina (Gould); Scl. Cat. p. 253.

Cauca, Remedios. (Mus. Brit.)
Eggs (no. 105) creamy white (reddish in some specimens), thickly blotched with chocolate-red: blotches in some specimens almost, in others quite confluent at the larger end: axis $\cdot 85$, diam. $\cdot 6$. (See Plate XLII. fig. 10.)

This is a more southern locality than has yet been recorded for the present species.

## Fam. Cotingide.

197. Tityra personata, Jard. et Selb. ; Scl. Cat. p. 238.

Remedios and Neche. (Mus. Brit.)
Iris dark red. Fruit in stomach.
Egg (no. 95) white: axis 1, diam. $\cdot 8$.
"The nest is placed almost on a level with the entrance in the hole of a decayed tree, and composed of a little dry grass."-T. K. S.
198. Tityra albitorques, Du Bus; Scl. Cat. p. 239 ; Scl. et Salv. P. Z. S. 1867, p. 757.

Remedios. (Mus. P. L. S.)
199. Hadrostomus homochrous, Scl. Cat A. B. p. 240.

Remedios. (Mus. Brit.)
Eggs (no. 103) chocolate-brown, with a zone of indistinct spots round the larger end : axis $\cdot 9$, diam. $\cdot 65$. (See Plate XLII. fig. 12.)
"A large massive nest for so small a bird, has an entrance at the side; but there is nothing artistic or pretty about it ; it is simply a mass of almost any substance that can be found, no doubt made in that way to protect the eggs and young from the heavy rains, it being always placed in a very exposed position at the extremity of the branch of a high tree. The bird seems to take a long time in building its nest; one $\mathbf{I}$ observed was more than a month before it had eggs. I had the pleasure of seeing the first piece of grass placed,
and was surprised at the speed with which the body of the nest was formed; the greater time seemed to be spent in lining and finishing it."-T. K.S.
200. Pachyrhamphus cinereiventris, Scl. Cat. A. B. p. 242. P. dorsalis, ibid. p. 243.

Sta. Elena.
Food, insects.
It is not possible, we think, to keep separate the two forms distinguished in Sclater's Catalogue under the above-given names.
201. Pachyrhamphus cinnamomeus, Lawr. Ann. L. N. Y. vii. p. 295 .

Remedios.
The Brown Becards of this genus have been long a source of trouble to us, the question being whether they are distinct species or females of the group of $P$. niger. Sclater, in his Review of Tityrince ${ }^{1}$, adhered to the former opinion; subsequently ${ }^{2}$ he adopted Dr . Cabanis's view that the brown birds are either females or young males ${ }^{3}$. It will be impossible to decide this question satisfactorily, except by the aid of resident observers; but of late we have been inclined to swing round to Sclater's original theory.

Mr. Salmon's specimens go to support this view, the one marked "male" showing the second spurious primary, the other marked "female" being without it, i.e. having this primary of its normal length.

On the whole we think it best for the present to employ Mr. Lawrence's name for this northern red form (which extends from Guatemala to Colombia), and the term rufus (Bodd.) for the Brazilian bird, which seems to be its southern representative.

If the brown birds are females and young males of the black forms, we ought occasionally to meeat with intermediate specimens. But amongst the multitudes that have come before us no such intermediate specimen has ever occured.
202. Pachyrhamphus versicolor (Hartl.); Scl. Cat. p. 243. (Mus. S.-G.)
203. Lathria fusco-cinerea (Lafr.); Cab. et Hein. Mus. Hein. ii. p. 101 ; Scl. et Salv. Nomencl. p. 56.

Alegria. (Mus. S.-G.)
204. Lathria unirufa (Scl).

Lipaugus unirufus, Scl. Cat. A. B. p. 244.
Remedios, Neche.
Food, insects.
The occurrence of this Central-American species so far south of Panama is new to us; but it has been already recorded by Mr. Cassin from the river Truando (Pr. Acad. Phil. 1860, p. 143).

[^39]205. Aulia rufescens (Scl.).

Lipaugus rufescens, Scl. P. Z. S. 1857, p. 296.
Remedios. (Mus. S.-G.)
A single immature specimen seems to be referable to this CentralAmerican form.
206. Lipaugus holerythrus, Scl. et Salv. P. Z. S. 1860, p. 211.

Neche.
Food, insects.
207. Rupicola sanguinolenta, Gould; Scl. et Salv. Ex. Orn. p. 29, pl. xv.

Concordia, Frontino. (Mus. S.-G.)
Iris yellow.
Eggs (no. 156) pale buff, spotted with various-sized spots of shades from red-brown to pale lilac, chiefly at the larger end: axis $1 \cdot 85$, diam. 1.35.

Mr. Salmon's skins of Rupicola belong to the form described by Mr. Gould as $R$. sanguinolenta, though perhaps not quite so dark as examples from Ecuador. Bogotá skins (Mus. S.-G.) belong to the lighter form, $R$. peruviana.

The egg of Rupicola was obtained by Goudot in Colombia ${ }^{1}$, and is figured by Des Murs in the ' Magasin de Zoologie,' 1843, Ois. pl. 37. M. Des Murs's figure agrees sufficiently well with Mr. Salmon's specimens, which, however, are not so thickly spotted.

Mr. Salmon thus describes his visit to the breeding-place of this bird:-"I once went to see the breeding-place of the Cock-of-theRock ; and a darker or wilder place I have never been in. Following up a mountain-stream in the district of Frontino, the gorge became gradually more enclosed and more rocky, till I arrived at the mouth of a cave, with high rock on each side and overshadowed by high trees, into which the sun never penetrated. All was wet and dark, and the only sound heard the rushing of the water over the rocks. We had hardly become accustomed to the gloom when a nest was found, a dark bird stealing away from what appeared to be a lump of mud upon the face of the rock. This upon examination proved to be a nest of the 'Cock-of-the-Rock' containing two eggs; it was built upon a projecting piece, the body being made of mud or clay, then a few sticks, and on the top lined with green moss. It was about five feet from the water. I did not see the male bird; nor indeed have I hardly ever seen male and female birds together, though I have seen both sexes in separate flocks."
208. Pipreola rieffert (Boiss.) ; Scl. Ibis, 1878, p. 166.

Retiro, Medellin, Sta. Elena. (Mus. S.-G.)
Stomach contained fruit.
Eggs (no. 43) pale salmon-colour, with a few dark red-brown spots: axis 1, diam. 8. (See Plate XLIII. fig. 7.)

[^40]209. Pipreola aureipectus (Lafr.) ; Scl. Ibis, 1878, p. 171.
(Mus. P. L. S.)
Mr. Salmon's skins fully agree with others from Venezuela. We are rather surprised to find this species so far west. We have never seen it in Bogotá collections.
210. Ampelion cinctus (Tsch.); Scl. Cat. p. 253.

Frontino. (Mus. S.-G.)
211. Heliochera rubrocristata (Laff. et d'Orb.); Scl. Cat. A. B. p. 255.

- Sta. Elena. (Mus. S.-G.)

Iris dark ; stomach contained insects.
212. Heliochera rufaxilla (Tsch.)

Ampelion rufaxilla, Cab. in Tsch. Faun. Per. Aves, p. 137, pl. vii. fig. 2.

Heliochera rufaxilla, Scl. et Salv. Nomencl. p. 58.
Sta. Elena. (Mus. S.-G. and P. L. S.)
Iris dark; stomach contained insects.
There is a Bogotá skin of this bird in the Paris Museum.
213. Querula cruenta (Bodd.) ; Scl. Cat. A. B. p. 257.

Pocune, Remedios. (Mus. S.-G.)
Stomach contained fruit.
214. Pyroderus orenocensis (Lafr.) ; Scl. Cat. A. B. p. 259.

Concordia, Frontino, Sta. Elena. (Mus. S.-G.)
Stomach contained fruit.
Eggs (no. 140) pale buff, spotted with various shades from dark red-brown to pale lilac: axis $1 \cdot 9$, diam. $1 \cdot 3$. (See Plate XLIII. fig. 7.)
"The nest, composed of sticks, is generally built rather high in the fork of a slender branch, and is exceedingly slight and small, not much larger than the nest of the Common Ring-Dove. By frightening the bird from her nest, 1 have caused the eggs to fall to the ground. The bird is exceedingly fierce in defending its nest from Hawks. I found the first nest I ever saw entirely from seeing a Red-nceked Fruit-Crow fly out at a passing Hawk." -T. K. S.

## Family Dendrocolaptide.

215. Sclerurus caudacutus, Vieill.; Scl. et Salv. P. Z. S. 1867, p. 573.

Frontino. (Mus. P. L. S.)
Agrees with Bogotá and Cayenne specimens.
216. Synallaxis frontalis, Pelz. ; Scl. P. Z. S. 1874, p. 8.

Concordia, Retiro, Medellin, Sta. Elena. (Mus. S.-G.)
Iris dark ; stomach contained insects.
Eggs (no. 49) white: axis ${ }^{85}$, diam. $\cdot 65$.
217. Synallaxis albescens, Temm.; Scl. P. Z.S. 1874, p. 9. Medellin. (Mus. S.-G.)
Iris dark; stomach contained insects.
Eggs (no.40) of a very pale greenish blue, nearly white : axis 88 , diam. 65 .
" The nest, which is placed in a tree or high bush, 6 or 8 feet from the ground, is made of sticks and twigs; and the eggs are placed on a few small green leaves. It is very much the shape of a pear placed horizontally, with an extended tunnel at the smaller end.
"I have seen the nest as large as that of an English Magpie, and as firmly made, though the bird is not larger than a Sparrow. The body of the nest is composed of sticks, many of them from four to six inches in length and a quarter of an inch in diameter; the tumnel entrance, which is often of considerable length, is composed of fine twigs beautifully interlaced, the entrance only just admitting the body of the bird; it is sometimes straight, sometimes winding. The top of the nest is roofed with a mass of large leaves, a protection against the heavy rains. Altogether it is a remarkable construction ; and it would be interesting to know how so small a bird can carry and fix such large sticks; but the bird at this time is exceedingly shy, always keeping at a distance from its nest when any one is near, even if carefully hidden from view.
"The nest is difficult to approach, being placed where the underwood is very thick; and the eggs can only be obtained by making an opening on one side, which is not an easy operation."-T. K. S.
218. Synallaxis pudica, Scl. P. Z. S. 1874, p. 10.

Remedios. (Mus. S.-G.)
Iris dark; stomach contained insects.
Eggs (no. 99) pale greenish blue : axis $\cdot 85$, diam. ${ }^{\circ} 65$.
219. Synallaxis uniruta, Lafr. ; Scl. P. Z. S. 1874, p. 14.

In Mr. Salmon's third collection (Mus. P. L. S.), without exact locality.
220. Synallayis erythrops, Scl. P. Z. S. 1874, p. 19.

Frontino. (Mus. S.-G.)
Iris dark ; stomach contained insects.
Eggs (no. 87) white : axis 95, diam. •65.
221. Pseudocolaptes boissoneauti (Lafr.); Scl. Cat. A. B. p. 156.

Frontino, Sta. Elena. (Mus. S.-G.)
Iris dark. Food, insects; nests in holes of trees.
Eggs (no. 30) white: axis $1 \cdot 14$, diam. 8 .
222. Thripadectes flammulatus (Eyton); Scl. Cat. A. B. p. 157.

Frontino. (Mus. S.-G.)
Iris dark. Stomach contained insects.
Eggs (no. 86) white : axis $1 \cdot 35$, diam. $\cdot 9$.
223. Automolus holostictus, Scl. et Salv. P. Z. S. 1875, p. 542.

Sta. Elena. (Mus. P. L. S. and S.-G.)
Iris dark.
Eggs (no.60) white : axis $1 \cdot 15$, diam. $\cdot 85$.
224. Automolus ignobilis, sp. nov.

Saturate rubiginoso-brunneus, subtus dilutior; lateribus capitis et gutture toto ad pectus rufescenti variegatis, et striis scapas plumarum occupantibus notatis; cauda obscure castanea unicolori; subalaribus et remigum marginibus interioribus late ochraceo-rufis. Long. tota $7 \cdot 8$, alre $3 \cdot 5$, cauda rectr. ext. $2 \cdot 0$, med. $3 \cdot 0$.
Hab. in St. Antioquiæ, reipubl. Columbianæ.
Mus. P. L. S.
Obs. Sp . colore uniformi, gutture obsoletiùs striato, insignis ; crassitie $A$. cervinigularis et huic quoad dorsi picturam non dissimilis.

Frontino. - Iris dark ; stomach contained insects.
Mr. Salmon obtained but one specimen of this bird, which seems to belong to an unrecognized species.

Though at first we took it for a young A. holostictus, accurate examination convinces us that such cannot be the case; and the bird seemed to be quite in adult plumage. The tail is much shorter than in $A$. holostictus, and the bill shorter, higher, and more compressed. The wings are short and much rounded, the third, fourth, and fifth primaries being nearly equal and longest. On the whole the species goes best next to $A$. rufo-brunneus ${ }^{1}$, of Costa Rica.

Eggs (no. 88) white : axis $1 \cdot 16$, diam. 86.
225. Automolus pallidigularis, Lawr. Anu. L. N. Y. vii. p. 465.

Remedios. (Mus. S.-G.) Iris dark.
This is a Veraguan and Panama species. Its extension so far south is new to us.
226. Philydor erythronotus, Scl. et Salv. Nomencl. p. 160.

Sta. Elena. (Mus. S.-G.)
A single specimen, agreeing with the type (from Bogotá) in Sclater's collection.
227. Anabazenops temporalis, Scl. Cat. A. B. p. 159.

Concordia. (Mus. P. L. S.)
It is perhaps somewhat doubtful whether this species can be kept separate from the Central-American form A. variegaticeps.
228. Xenops rutilus, Licht.
X. rutilus et $X$. heterurus, Scl. Cat. A. B. p. 159.

Sta. Elena. (Mus. S.-G.)
Iris dark. Stomach contained insects.
${ }^{1}$ Philydor rufo-brunnens, Lawr. Ann. Lyc, N. Y. vol. viii. p. 126.
229. Xenops genibarbis, Ill.
X. genibarbis, X. littoralis, et X. mexicanus, Scl. Cat. A. B. p. 159.

Remedios. (Mus. S.-G.)
Iris dark.
It seems impossible to separate satisfactorily the various local forms of this and the preceding species of Xenops; and in our 'Nomenclator' we have reunited them.
230. Sittasomus olivaceus, Max. ; Scl, et Salv. P. Z. S. 1868, p. 630 .

Remedios.
Iris dark. Stomach contained insects.
231. Margarornis perlata (Less.) ; Salvin, Ibis, 1874, p. 322.

Sta. Elena. (Mus. S.-G.)
Eggs (no. 62) white: axis $\cdot 75$, diam. $\cdot 5$.
232. Margarornis brunnescens, Scl. Cat. A. B. p. 161.

Sta. Elena. (Mus. S.-G.)
Iris dark. Stomach contained insects.
233. Glyphorhynchus cuneatus (Licht.); Scl, et Salv. P. Z. S. 1873, p. 270.

Remedios.
234. Dendrocincla tyrannina (Lafr.) ; Scl. Cat. A. B. p. 162. Sta. Elena. (Mus. S.-G.)
235. Dendrocolaptes validus, Scl. et Salv. P. Z. S. 1866,

Concordia, Medellin, Frontino, and Sta. Elena. (Mus. S.-G.)
Iris dark.
Eggs (no. 161) white: axis $1 \cdot 15$, diam. 85 .
"Nest is made in a hole of a tree, and the number of eggs two."
236. Xiphocolaptes promeropirhynchus (Less.) ; Scl. Cat. A. B. p. 163.

Sta. Elena, Remedios. (Mus. S.-G. and P. L. S.)
Iris dark
237. Dendrornis triangularis (Lafr.); Scl. Cat. A. B.

Sta. Elena.
Iris dark.
238. Dendrornis lacrymosa, Lawr. Ann. L. N. Y. viii. p. 467. Remedios. (Mus. P.L.S.)
This Central-American form has not previously been recorded so
far south. The single skin in Mr. Salmon's seventh collection (Mus. P. L.S.) cannot be separated, although the spots on the lower surface are not quite so distinctly rounded.
239. Picolaptes lacrymiger (Lafr.); Scl. Cat. A. B. p. 166.

Medellin, Sta. Elena, Envigado, Frontino. (Mus. S.-G.)
Stomach contained insects.
Eggs (no. 63) white: axis $1 \cdot 05$, diam. 85 .
240. Picolaptes albo-lineatus, Lafr. Rev. Zool. 1850, p. 278; Scl. et Salv. P. Z. S. 1868, p. 167.

Remedios, Sta. Elena. (Mus. P. L.S. and S.-G.)
Mr. Salmon's skin agrees with Bogotá and Venezuelan specimens which we refer to this species.
241. Xiphorhynchus trochilirostris (Licht.) ; Scl. Cat. A. B. p. 167 .

Remedios. (Mus. S.-G.)
Iris dark.
Eggs (no. 156) white, nearly round: axis 1 , diam. $\cdot 84$.
"The only nest I saw was inside a decayed tree, which had been cut off about tbree feet from the ground, and become hollow to the roots, so that the nest had no protection from the rain."-T. K. S.
242. Xiphorhynchus pusillus, Scl.; Salvin, P. Z.S. 1870, p. 193.

Concordia. (Mus. S.-G.)

## Fam. Formicaride.

243. Cymbilanius lineatus (Vieill.) ; Scl. Cat. p. 170.

Remedios and Neche.
Iris red. Stomach contained insects.
244. Thamnophilus transandeanus, Scl. Cat. p. 1 亿2.

Remedios, Neche. (Mus. S.-G. and P. L. S.)
Iris red.
245. Thamnophilus nevius (Gm.) ; Scl. Cat. p. 173.

Neche. (Mus. S.-G.)
Iris white.
246. Thamnophilus doliatus (Linn.); Scl. Cat. p. 173.

Examples of this widely diffused species were in Mr. Salmon's fifth collection.
247. Thamnophilus multistriatus, Lafr.; Scl. Cat. A. B. p. 175.

Concordia, Medellin. (Mus. S.-G.)
Iris white. Food, insects. Nest hanging from trees.
Eggs (no. 31) whitish, thickly spotted and streaked at the larger end with red-brown: axis 1 , diam. ${ }^{\circ} 65$.
248. Dysithamnus semicinereus, Scl. Cat. A. B. p. 177.

Concordia.
249. Dysithamnus unicolor, Scl. Cat. A. B. p. 178.

Sta. Elena. (Mus. S.-G.)
Stomach contained insects.
Eggs (no. 44) creamy-white, sparsely spotted with small red spots, and with a zone of large blotches of the same colour round the middle: axis $\cdot 98$, diam. $\cdot 67$. (See Plate XLIII. fig. 9.)
250. Myrmotherula surinamensis (Gm.); Scl. Cat. p. 179.

Remedios. (Mus. S.-G.)
Iris dark. Stomach contained insects.
Eggs (no. 102) white: axis $\cdot 8$, diam. $\cdot 65$.
"The nest is made of very fine roots and grass, and placed in low bushes. It is a slight network hanging at the end of a thin bough, very deep, and suspended between a fork, with the natural leaves of the shrub or bush above to protect it from the rain.
"The bird is a busy insect-hunter, but difficult to observe on account of its small size and the nature of its haunts."-TT. K. S.
251. Myrmotherula fulviventris, Lawr. Ann. L. N. Y. vii. p. 468 ; Scl. et Salv. P. Z. S. 1864, p. 356 ; Salv. Ibis, 1874, p. 311.

Remedios. (Mus. S.-G.)
252. Myrmotherula melena (Scl.), Cat. A. B. p. 180.

Neche. (Mus. S.-G.)
Iris dark.
253. Formicivora caudata, Scl. Cat. A. B. p. 182.

Sta. Elena. (Mus. S.-G.)
Iris dark.
254. Formicivora consobrina, Scl. Cat. A. B. p. 183.

Pocune. (Mus. S.-G.)
255. Ramphocenus rufiventris (Bp.); Scl. Cat. A. B. p. 184.

Sta. Elena. (Mus. P. L. S.)
Iris red. Food, insects. Nests in low bushes.
256. Ramphocenus cinereiventris, Scl. P. Z. S. 1855, p. 76, pl. lxxxvii.
R. semitorquatus, Lawr. Ann. L. N. Y. vii. p. 469 (1862); Salvin, P. Z. S. 1867, p. 145.

Mus. P. L. S.
A single example of this Ramphoccenus without label is in the eighth collection. The type of Sclater's species was procured near Pasto; and it is of interest to get a specimen from an intermediate locality between that place and Panama, the locality of $\boldsymbol{R}$. semitor-
quatus of Lawrence. An examination of Sclater's type in the Derby Museum, Liverpool, and a comparison of it with the present example and others from Panama, have brought us to the conclusion that Salvin's suspicions (l.s.c.) as to the identity of the two species were well founded. The extent of the slight postocular spot has been somewhat magnified in Sclater's figure; and though this spot is hardly apparent in Mr. Salmon's specimen, it does not seem to us to be sufficient to keep the two birds distinct.
257. Cercomacra nigricans, Scl. P. Z. S. 1858, p. 245.

Remedios. (Mus. S.-G.)
Iris dark. Stomach contained insects.
Eggs (no. 101) mahogany-colour, mottled with darker shades of the same colour: axis $\cdot 85$, diam. $\cdot 6$.
"The nest, made of dry grasses, is placed between a fork at the extremity of the boughs of low bushes." - T. K. S.
258. Myrmeciza exsul, Scl. Cat. A. B. p. 187.

Neche. (Mus. S.-G.)
Iris dark. Stomach contained insects.
259. Pithys leucaspis (Scl.), Cat. A. B. p. 189.

Remedios, Neche. (Mus. S.-G.)
Iris dark.
260. Formicarius hoffmanni, Cab.; Finsch. P. Z. S. 1870, p. 568.

Remedios. (Mus. S.-G.)
Iris dark.
261. Grallaria ruficeps, Sclater, P. Z. S. 1873, p. 279 , et lbis, 1877, p. 444, pl. viii.

Medellin, Sta. Elena. (Mus. P. L. S. and S.-G.)
Iris dark. Food, insects.
Eggs (no. 40) rich dark greenish blue: axis $1 \cdot 45$, diam. $1^{1} 1$. (See Plate XLIII. fig. 5.)
262. Grallaria flavo-tincta, Scl. Ibis, 1877, p. 445, pl. ix.

Frontino. (Mus. P. L. S.)
263. Grallaria rufo-cinerea, sp. nov.

Supra saturate cinnamomeo-rufa, subtus obscure cinerea; capitis et cervicis lateribus dorso concoloribus; remigibus intùs nigris extus rufis; cauda omnino rufo-cinnamomea; rostro nigro; pedibus carneis. Long. tota $6^{\circ} 0$, ale $3 \cdot 4$, caudle 1.8 , tursi 1.7 .
Hab. Sta. Elena in prov. Antioquiæ (Salmon).
Mus. P. L. S.
Obs. Sp. crassitie G. rufulam paulo excedens, coloribus omnino diversa.

Iris dark. Food, insects.
But one example of the fine new Grallaria is in Mr. Salmon's eighth
collection. It must be placed amongst the "uniformes" of Sclater's arrangement (Ibis, 1877) between G. griseinucha and G. rufula.
264. Grallaria ruficapilla (Lafr.); Scl. Ibis, 1877, p. 447.

Concordia, Sta. Elena. (Mus. S.-G.)
Iris dark. Stomach contained insects.
Eggs (no. 111) greenish-blue: axis $1 \cdot 23$, diam. 1•04. (See Plate XLIII. fig. 6.)
"In the morning, and shortly before sunset, may be heard a melancholy cry as this Ant-Thrush creeps amongst the brushwood. Many times have I followed to obtain a specimen, and after a tough scramble of an hour given it up for a bad job. At one time you seem to stand right upon it, and a moment after you hear it 4 yards off; again you reach the spot, and you hear it 20 yards behind you; you return, then it is on the right; soon after you hear it on the left. At first you imagine the bird has the power of a ventriloquist; but by dint of patience and watching you may see it creeping swiftly and silently among the grass and brushwood in places where it has to pass a rather more open spot, and the mystery is explained.
"The nest is also difficult to obtain : it is placed at some height from the ground, and made of a mass of roots, dead leaves, and moss, lined with roots and fibres. The eggs are two in number, rather round and blue."-T.K.S.
265. Grallaricula nana (Lafr.); Scl. et Salv. Nomencl. p. 76.

Grallaria nana, Lafr. R. Z. 1842, p. 334.
Sta. Elena. (Mus. S.-G.)
266. Grallaricula cucullata (Sclater), Scl. et Salv. Nomencl. p. 76.

Conopophaga cucullata, Scl. P. Z. S. 1856, p. 29, pl. 119, et 1858, p. 287, et Cat. A. B. p. 194.
Sta. Elena. (Mus. P. L. S. and S.-G.)
Iris dark. Stomach contained insects.
Eggs (no. 75) pale coffee-colour, spotted and blotched with dark red-brown spots: axis ${ }^{8} 8$, diam. ${ }^{\circ} 65$.

This little bird does not range very satisfactorily either in Grallaricula or in Conopophaga, where it was first placed by Sclater, but is best arranged in the former genus, being not very far in structure from G. favirostris. Mr. Salmon's specimens have the rufous head and throat not nearly so decided as in Sclater's type (which is a Bogotá skin) ; and the tarsi are slightly longer. The rufous wingedgings and the red tint in the middle of the belly are likewise absent in Mr. Salmon's specimen, which, though marked male, must, we think, if really of the same species, be a female. The figure (P. Z. S. 1856, pl. 119) is much too brightly coloured.

Fam. Pteroptochide.
267. Scytalopus magellanicus (Lath.) ; Sclater, Ibis, 1874, p. 193.

Sta. Elena. (Mus, P. L. S. and S.-G.)
Iris dark. Stomach contained insects.
Eggs (no. 69) white: axis $\cdot 9$, diam. ${ }^{7}$.
Mr. Salmon's skins cannot be distinguished from examples from Ecuador in Sclater's collection.
"The nest is placed in a mass of moss on a bank; it is also composed entirely of moss. The female lays two eggs, large for the size of the bird, and white. I was first attracted to this bird by a harsh cry continually repeated near me, and immediately looked round to discover what animal it could be, expecting something of considerable size, but, after carefully searching, saw what appeared a small black mouse creeping along the ground. Upon killing it I found it to be a specimen of this bird."-T. K. S.
268. Acropternis orthonyx (Lafr.) ; Sclater, Ibis, 1874, p. 204.

Sta. Elena. (Mus. S.-G.)
Iris dark. Stomach contained insects.
Fam. Trochilide.
269. Androdon equatorialis, Gould, Ann. and Mag. N. II. ser. 3, vol. xii. p. 247 (1863).

Remedios. (Mus. S.-G.)
A single skin of this remarkable species, which was previously only known as an inhabitant of Ecuador.
270. Glaucis hirsuta (Gm.) ; Gould, H. B. i. pl. v.; Salv. and Elliot, Ibis, 1873, p. 276.

Santa Elena. (Mus. S.-G.)
271. Phaethornis longirostris (Less. et Delattre); Gould, H. B. i. pl. xix. ; Salv. \& Elliot, Ibis, 1873, p. 5.

Remedios. (Mus. S.-G.)
2j2. Phaethornis syrmatophorus, Gould, II. B. i. pl. xx. Sta. Elena, Medellin. (Mus. S.-G.)
273. Lampornis violicauda (Bodd.); Elliot, Ibis, 1872, p. 351.
L. mango, Linn. ; Gould, H. B. ii. pl. lxxiv.
(Mus. P. L. S.)
274. Lafresnaya gayi (Bourc.); Gould, H. B. ii. pl. lexxyi. Sta. Elena. (Mus. S.-G.)
275. Hemistephania ludovicie (Bourc. et Muls.) ; Gould, II. B. ii. pl. Ixxxviii.

Sta. Elena. (Mus. S.-G.).

Doryphora being the name of a well-known genus of Phytophagous Coleoptera, cannot continue to be used for this bird and its allies; Reichenbach's Hemistephania (Aufz. d. Colibris, p. 9, 1853) must therefore take its place.
276. Chalybura buffoni (Less.) ; Gould, H. B. ii. pl. lexxix. Remedios, Sta. Elena. (Mus. S.-G.)
277. Pheolema rubinoides (Bourc. et Muls.); Gould, H. B. iv. pl. celxviii.
(Mus. P. L. S.)
278. Panoplites flavescens (Bourc.) ; Gould, H. B. ii. pl. cxi. Medellin. (Mus. P. L. S. and S.-G.)
279. Florisuga mellivora (Linn.); Gould, H. B. ii. pl. cxiii. Remedios.
280. Acestrura mulsanti (Bourc.) ; Gould, H. B. iii. pl. celv. Medellin. (Mus. S.-G.)
281. Steganura underwoodi (Less.); Gould, H. B. iii. pl. clxii.

Sta. Elena, Medellin. (Mus. S.-G.)
282. Cynanthus mocoa (Delattre et Bourc.); Gould, H. B. iii. pl. clxxiii.

Sta. Elena. (Mus. S.-G. and P. L. S.)
This is the most northern locality yet recorded for this greentailed Cynanthus.
283. Metallura tyrianthina (Bourc.); Gould, H. B. iii. pl. cxev.

Sta. Elena.
284. Adelomyia cervina, Gould, Ann. \& Mag. Nat. Hist. ser. 4, x. p. 453.

Medellin. (Mus. S.-G.)
285. Heliothrix barroti (Bourc.); Gould, H. B. iv. pl. cexti. Remedios.
286. Heliotrypha parzudakil (Longuem.); Gould, H. B. iv. pl. cexl.

Sta. Elena. (Mus. S.-G.)
The nest is composed chiefly of moss, to which is attached outwardly pieces of lichen. The inside is thickly lined with the pubescence of the base of the fronds of ferns.
287. Petasophora anais (Less.); Gould, H. B. iv. pl. cexxiv.

Sta. Elena, Medellin. (Mus. S.-G.)
Proc. Zool. Soc.-1879, No. XXXIV.
288. Petasophora cyanotis (Bourc.); Gould, H. B. iv. pl. cexxviii.

Sta. Elena.
289. Helianthea typica, Bp.; Gould, H. B. iv. pl. ccexxp.
290. Bourcieria torquata (Boiss.) ; Gould, H. B. iv. pl. celi. Sta. Elena. (Mus. S.-G.)
The nest of this species is composed outwardly of moss, and thickly lined with fine pubescence from the bases of fern-fronds.
291. Lampropygia columbiana, Elliot, Ibis, 1876, p. 57.

Frontino, Sta. Elena, Medellin. (Mus. S.-G.)
These specimens agree with the Bogotá examples upon which Mr. Elliot founded the name L. columbiana, and present the slight differences by which it is to be distinguished from the Venezuelan race, the true $L$. coligena, Lesson.
292. Heliomaster longirostris (Vieill.); Gould, H. B. iv. pl. cclix.
293. Eriocnemis aurelie (Bourc.); Gould, H. B. iv. pl. celxxxiii.

Sta. Elena, Medellin. (Mus. S.-G.)
294. Eriocnemis lugens (Gould) ; H. B. iv. pl. celxxxii.

The nest of this species is composed chiefly of moss, and lined with the coarser portions of the pubescence from the base of the fronds of ferns.
295. Cyanomyta francie (Bourc.); Gould, H. B. v. pl. celxxxvii.
(Mus. P. L. S.)
296. Amazilia riefferi (Bourc.) ; Gould, H. B. r. pl. ccexi.

A nest sent is a deep structure composed mostly of Bombax seeds, to which are attached on the outside bits of lichen.
297. Saucerottia warszewiezi (Cab. \& Heine).

Hemithylaca warcewiezii, Cab. et Heine, Mus. Hein. iii. p. 38.
(Mus. S.-G.)
298. Saucerottia typica, Bp.; Gould, H. B. v. pl. cecxxi. (Mus. S.-G.)
299. Juliamyia typica, Bp.; Gould, H. B. v. pl. cecexxxii.
300. Damophila amabilis (Gould); Gould, H. B. v. pl. cecxli. (Mus. S.-G.)
301. Chlorostilbon angustipennis (Fraser); Gould, H. B. ₹. pl. cccliii.

Medellin. (Mus. S.-G.)
The nest of this species brought home by Mr. Salmon is composed chiefly of the seed of Bombax ceiba, to which small leaves and bits of moss are stuck on the outside. It was apparently attached to the extremity of a branch of a tree, and is a moderately deep structure, but has no long outside appendages.

## Fam. Cypselide.

302. Panyptila cayanensis (Gm.) ; Scl. P.Z.S. 1865, p. 606. One specimen, without exact locality. (Mus. S.-G.) There is a Bogotá skin of this Swift in Sclater's collection.
303. Hemiprocne zonaris (Shaw); Scl. et Salv. Nomencl. p. 95.

Chatura zonaris, Scl, P.Z.S. 1865, p. 609.
Concordia, Retiro. (Mus. S.-G.)
Eggs (no. 114) elongated, white: axis $1 \cdot 3$, diam. $\cdot 87$.
"Makes a nest of mud and moss in caves, or under the shelter of rocks, and lays two eggs."-T. K.S.
304. Chetura rutila (Vieill.) ; Scl. P.Z.S. 1865, p. 613.

Retiro. (Mus. P. L. S.)
There is now no doubt about the occurrence of this Swift in Colombia. In Sclater's collection is a skin from Ecuador, received from Mr. G. N. Lawrence.

## Fam. Caprimulgide.

305. Nyctibius jamaicensis (Gm.) ; Scl. P. Z. S. 1866, p. 129.

Concordia. (Mus. S.-G. and P.L. S.)
306. Chordeiles virginianus (Gm.); Scl. P.Z.S. 1866, p. 133.

One skin of the paler-coloured form of this species was in Mr. Salmon's fifth collection. (Mus. P. L. S.)
307. Antrostomus carolinensis (Gm.) ; Scl. P.Z.S. 1866, p. 136 .

Medellin. (Mus. S.-G.)
A female of this species, not previously recorded south of Panama.
308. Stenopsis cayennensis (Gm.); Scl. P. Z. S. 1866, p. 140.

In Mr. Salmon's fifth collection. (Mus. S.-G.)
309. Stenopsis ruficervix, Scl. P. Z. S. 1866, p. 140.

Envigado, Retiro, Sta. Elena. (Mus. S.-G.)
Iris dark.
Eggs (no. 112) white: axis 1•12, diam. 85 .
"The nest is on the ground, amongst ferns \&c.
"The eggs vary very much both in size and colour; some are quite white, others pale red with small spots. At first I was inclined to think there were two species, as many of the birds differ considerably in appearance. I have never seen more than one egg in a nest.,' ${ }^{\text {T. }}$ K. S.
310. Hydropsalis lyra, Bp.; Scl. P.Z.S. 1866, p. 143.

Envigado. (Mus. S.-G.)
311. Hydropsalis segmentata, Cassin; Scl. P. Z. S. 1866, p. 143.

In Mr. Salmou's fifth collection. (Mus. S.-G.)
312. Nyctidromus albicollis (Gm.); Scl. P. Z.S. 1866, p. 144.

Concordia, Remedios, Medellin.
Iris dark.
313. Steatornis caripensis, Humboldt.

Sta. Elena. (Mus. S.-G.)
Mr. Salmon told us that he bought this specimen alive from an Indian in the village of Sta. Elena.

Fam. Picide.
314. Picumnus olivaceus (Lafr.); Salvin, P. Z. S. 1870, p. 212, et Ibis, 1874, p. 323.

Medellin. (Mus. S.-G.)
315. Campephilus malherbii, Gray \& Mitch.; Scl. Cat. A. B. p. 311 .

Cauca, Concordia, Remedios. (Mus. S.-G.)
316. Campephilus pollens (Bp.).

Picus pollens, Bp. Atti Soc. It. vi. p. 406 (1845).
Megapicus grayii, Malh. (1849).
Campephilus grayii, Scl. Cat. p. 331.
Sta. Elena, Frontino. (Mus. S.-G.)
Iris dark.
317. Campephilus hematogaster (Tsch.); Scl. Cat. A. B. p. 332.

Sta. Elena, Remedios. (Mus. P. L. S.)
Iris yellow.
318. Dryocopus lineatus (Linn.) ; Scl. Cat. A. B. p. 332.

Sta. Elena. (Mus. S.-G. and P. L. S.)
D. fuscipennis, Sclater, of Ecuador, merely differs in its brownish wings, and is, we now think, inseparable. In Mr. Salmon's skins the wings are quite as black as in eastern specimens.
319. Chloronerpes fumigatus (d’Orb.); Scl. Cat. A. B. p. 337.

Frontino. (Mus. S.-G.)
320. Chloronerpes cecilie (Malh.) ; Scl. Cat. A. B. p. 338.

Antioquia, Remedios, Neche. (Mus. S.-G. and P. L. S.)
Iris dark.
321. Chloronerpes dignus, Scl. et Salv. P. Z. S. 1877, p. 20, pl. i.

Jerico. (Mus. P.L.S.)
322. Chloronerpes xanthochlorus, Scl. et Salv. P.Z.S. 1875, p. 238.

Remedios. (Mus. S.-G.)
A female of this rare species, agreeing with the type from Venezuela in Mus. P. L. S.
323. Chloronerpes rubiginosus (Sw.).

Chloronerpes rubiginosus et C. canipileus, Scl. Cat. A. B. p. 339.
Retiro, Concordia, Sta. Elena.
Iris dark.
After examining a series of these two supposed species from Venezuela, Colombia, Ecuador, and Peru, including a specimen that has been compared with d'Orbigny's type of Picus canipileus, we have come to the conclusion that there are no grounds for maintaining their distinctness.
324. Chrysoptilus punctigularis (Bodd.); Scl. Cat. A. B. p. 340 .

Remedios.
Iris dark.
325. Melanerpes pulcher, Scl. P. Z. S. 1870, p. 330; Wyatt, Ibis, 1871, p. 380.

Remedios. (Mus. S.-G.)
Iris dark. Stomach contained insects.
326. Melanerpes flavigularis (Malh.); Sel. Cat. A. B. p. 341 .

Retiro, Concordia, Sta. Elena. (Mus. S.-G. and P. L. S.)
327. Hypoxanthus rivolit (Boiss.).

Colaptes rivolii, Scl. Cat. A. B. p. 344.
Retiro, Sta. Elena. (Mus. S.-G.)
Iris dark.
Egg (no. 119) glossy white : axis $1 \times 25$, diam. ${ }^{\circ} 85$.
328. Celeus loricatus (Reich.).

Meiglyptes loricatus, Reich. Handb. p. 405 (1853), et Icon, t. delxxi. 4495, 6.

Celeus mentalis, Cassin (1860) ; Scl. et Salv. P. Z. S. 1864, p. 367.
Picus loricatus et P. pholidotus, Sund. Pic. p. 87.
"Remedios and Neche."
"Iris dark."
The male from Neche agrees with Cassin's plate (Journ. Phil. Ac. V., pl. 52. figs. 1, 2), and shows the red throat. It appears, however, that Reichenbach's name is the oldest for this species, which ranges from Panama to Guayaquil.

Fam. Momotide.
329. Momotus aquatorialis, Gould, P. Z. S. 1857, p. 233.

Envigado, Retiro, Concordia, Froutino. (Mus. P. L. S. and S.-G.) Iris red.
Eggs (no. 135) glossy white: axis $1 \cdot 55$, diam. $1 \cdot 22$.
Mr. Salmon's skins are of the large western form described by Mr. Gould on specimens from Ecuador.
"The nest of this bird is rather curious; it is made by the bird burrowing in a sandbank for about three feet, and then forming a chamber about eighteen inches in diameter, where the eggs are deposited on the sand."-T. K.S.
330. Urospatha martil (Spix) ; Salv. Att. Ac. Sc. Torino, iv. p. 180 (1868); Scl. et Salv. Nomencl. p. 102.

Remedios, Neche. (Mus. S.-G.)
Iris dark. Beetles in stomach.
331. Prionirhynchus platyrhynchus (Leadb.) ; Scl. P. Z. S. 1857, p. 256.

Remedios. (Mus. S.-G. and P. L. S.)
Fam. Alcedinide.
332. Ceryle torquata (Linn.); Sharpe, Kingf. pl. xaii.

Neche.
Iris dark.
333. Ceryle amazona (Lath.) ; Sharpe, Kingf. pl. xxiv. Neche.
334. Ceryle cabanisi (Tsch.); Sharpe, Kingf. pl. xxy. Retiro, Concordia, Medellin.

Fam. Trogonide.
335. Trogon collaris, Vieill. ; Gould, Mon. Trog. ed. ii. pl. xiii.

Concordia, Frontino, Sta. Elena. (Mus. S.-G.)
Iris dark.
Eggs (no 116) white: axis $1 \cdot 1$, diam. $\cdot 9$.
"Lays two eggs in a hole of a tree."-T. K. S.
336. Trogon atricollis (Vieill.) ; Gould, Mon. Trog. ed. ii. pl. xiv.

Remedios, Neche. (Mus. S.-G.)
337. Trogon meridionalis, Sw.; Gould, Mon. Trog. ed. ii. pl. xvii.

Remedios. (Mus. S.-G. and P. L. S.)
Iris dark. Stomach contained fruit.
338. Trogon chionurus, Scl. et Salv.; Gould, Mon. Trog. ed. ii. pl. xxii.

Remedios, Neche. (Mus. P. L. S. and S.-G.)
Iris dark.
Eggs (no. 157) white: axis $1 \cdot 13$, diam. $\cdot 95$.
"Builds in the holes of palm trees, and lays two white eggs."T.K.S.
339. Trogon macrurus, Gould, Mon. Trog. ed.ii. pl. xyx.

Remedios, Neche. (Mus. S.-G. and P. L. S.)
Iris dark. Stomach contained fruit.
340. Pharomacrus fulgidus (Gould); Gould, Mon. Trog. ed. ii. pl. iii.

Concordia, Sta. Elena. (Mus. S.-G.)
Iris dark. Stomach contained fruit.
341. Pharomacrus auriceps (Gould) ; Mon. Trog.ed. ii. pl.iv.

Concordia, Frontino, Sta. Elena. (Mus. P. L. S. and S.-G.)
Iris dark. Stomach contained fruit.
Eggs (no. 127) greenish blue: axis 1•45, diam. 1•17.
"Lays two eggs in holes in trees, making no nest."-T. K. S.

## Fam. Galbulide.

342. Galbula ruficauda, Cuv. ; Scl. Cat. A. B. p. 266.

Frontino. (Mus. S.-G.)
343. Brachygalba salmoni, sp. nov.

Aneo-viridis, pilei plumis fusco adumbratis, gutture et remigibus intus ad basin albis, ventre medio et crisso castaneis; rostro nigro; pedibus fuscis. Long. tot. $7 \cdot 2$, ala $2 \cdot 8$, cauda $2 \cdot 3$, rostri a rictu 1.8 .
Hab. Neche in Statu Antioquiæ, reipubl. Columbianæ (Salmon).
Mus. P. L. S. et S.-G.
Obs. Sp. a B. goeringi, cui affinis, pileo dorso concolori nec fusco distinguenda.

Mr. Salmon obtained on the Neche two examples of what appears to be a new species of the black-billed section of Brachygalba. They are marked $\sigma^{*}$ and $\circ$; but both are immature. The male would, no doubt, have the middle of the belly white as in $B$. goeringi, nobis ${ }^{1}$, from which the new species may be at once distinguished by its

$$
{ }^{1} \text { P. Z. S. 1869, p. 243, pl. xviii. }
$$

uniform colour above, the feathers of the front and vertex being merely slightly edged with brown.

The tail is nearly square as in other Brachygalbe ; the bill is quite black.
344. Jacamerops grandis (Gm.) ; Scl. Cat. A. B. p. 268.

Remedios.
Iris dark.
Fam. Bucconide.
345. Bucco pectoralis, G. R. Gray, Gen. B. pl. 26 ; Scl. Syn. Bucc. p. 8 .

Neche.
A species hitherto only known from Panama.
346. Bucco subtectus, Scl. Cat. A. B. p. 270.

Neche.
347. Bucco radiatus, Scl. Cat. A. B. p. 271.

Remedios, Neche. (Mus. S.-G. and P. L. S.)
The type specimen of this species (Mus. P. L. S.) is rather whiter below; but a Bogotá skin exactly agreeing with Mr. Salmon's specimens is in Sclater's collection.
348. Malacoptila castanea, Verreaux, Rev. de Zool. xviii. p. 355, pl. xix. (1866).

Frontino. (Mus. S.-G. and P. L. S.)
Mr. Salmon's skins of this fine species agree with others from Ecuador. The type is said to have been received from Bogotá.
349. Malacoptila panamensis, Lafr.; Scl. et Salv. P. Z. S. 1870, p. 201.

Remedios. (Mus. P. L. S.)
Mr. Salmon's skins cannot be distinguished from Central-American specimens.
350. Monasa pallescens, Cassin, Pr. Ac. Phil. 1860, p. 134, et 1864, p. 287, t. iv.; Scl. et Salv. Ibis, 1871, p. 374.

Remedios, Neche. (Mus. S.-G. and P. L. S.)
Iris dark. Stomach contained lizards \&c.

## Fam. Cuculide.

351. Crotophaga ani (Linn.) ; Scl. Cat. A. B. p. 320.

Retiro, Medellin.
Iris dark.
"The nest is simply a mass of sticks with a side entrance. It is generally reported by the natives that several birds lay their eggs in the same nest." - T. K. S.
352. Crotophaga major, Linn.; Scl. Cat. A. B. p. 320.

Neche.
353. Diplopterus navius (Linn.); Sclater, Cat. A. B. p. 321. Concordia, Medellin.
354. Piaya cayana (Linn); Scl. Cat. A. B. p. 321 .

Envigado. (Mus. S.-G. and P. L. S.)
355. Piaya minuta (Vieill.); Scl. Cat. A. B. p. 322.

Medellin.
Iris red. Stomach contained insects.
356. Coccyzus americanus (Linn.).

Medellin. (Mus. S.-G. and P. L. S.)
Iris dark.
357. Coccyzus erythrophthalmus (Wils.).

Medellin. (Mus. S.-G. and P.L. S.)
Fam. Ramphastide.
358. Ramphastos tocard, Vieill. ; Gould, Mon. ed. ii. pl. iv.

Concordia, Medellin, Remedios.
Iris red.
359. Ramphastos citreolemus, Gould; Mon. ed. ii. pl. ix.

Medellin, Remedios. (Mus. S.-G.)
Iris blue.
360. Pteroglossus torquatus (Wagl.) ; Gould, Mon. ed. ii. pl. xx.

Remedios. (Mus. P.L.S.)
Iris yellow.
361. Andigena spilorhynchus, Gould, P. Z. S. 1858, p. 149.

Frontino, Concordia, Remedios. (Mus. S.-G. and P. L. S.)
Iris dark red.
This bird comes very near to $A$. nigrirostris, but may perhaps remain distinct.
362. Aulacorhamphus hematopygius, Gould, Mon. ed. ii. pl. xliv.

Concordia, Remedios. (Mus. S.-G. and P.L. S.)
Iris red.
363. Aulacorhamphus albivitta (Boiss.) ; Gould, Mon. ed. ii. pl. xlix.

Envigado, Pocune, Concordia. (Mus. S.-G. and P. L. S.)
Fam. Capitonide.
364. Capito maculicoronatus, Lawr.; Marshall, Mon. Barb. pl. lxi.

Remedios, Neche. (Mus. S.-G. and P. L. S.)
Iris dark.
Previously only known from Panama.
365. Capito bourcieri (Lafr.); Marshall, Mon. Barb. pl. lxvi. Frontino.
Iris dark. Stomach contained fruit.
Fam. Psittacide.
366. Ara militaris (Linn.).

Sittace militaris, Finsch, Papag. i. p. 396.
In Mr. Salmon's fifth collection.
367. Ara severa (Linn.)

Sittace severa, Finsch, Papag. i. p. 417.
Cauca.
368. Conurus wagleri, Gray ; Finsch, Papag. i. p. 459.

Medellin. (Mus. S.-G. and P.L. S.)
369. Brotogerys tovi (Gm.); Finsch, Papag. ii. p. 99.

Remedios.
Iris dark. Stomach contained fruit.
370. Cerysotis diademata, Spix ; Finsch, Papag. ii. p. 545.

Remedios.
371. Chrysotis farinosa (Bodd.) ; Finsch, Papag. ii. p. 565.

Remedios.
372. Chrysotis mercenaria (Tch.); Finsch, Papag. ii. p. 594.

Concordia.
373. Pionus menstruus (Linn.).

Pionias menstruus, Finsch, Papag. ii. p. 441
Remedios.
"Builds in the holes of decayed palm trees, and lays four white eggs."-T. K. S.
374. Pionus chalcopterus (Fraser).

Pionias chalcopterus, Finsch, Papag. ii. p. 462.
Envigado, Concordia. (Mus. S.-G.)
375. Caica pyrilia (Bp.); Wyatt, Ibis, 1871, p. 381.

Pionias pyrilia, Finsch, Papag. ii. p. 419.
Remedios. (Mus. P. L. S.)
Iris dark ; stomach contained fruit.

STRIGES.
376. Strix flammea (Linn.).

Medellin.
377. Syrnium hylophilum (Temm.).

Rio Negro, Sta. Elena. (Mus. S.-G.)
378. Scops brasilianus (Gm.).

Envigado, Concordia, Medellin, Sta. Elena. (Mus. S.-G.)
Iris yellow.
Eggs (no. 127) white: axis 1•4, diam. 1.2.
" Builds, or rather lays its eggs, in a variety of places. I have seen them under the eaves of houses, as well as in the holes of trees, old walls, and buildings, but have never seen the slightest appearance of nest. Its food consists chiefly of beetles; but it undoubtedly also feeds on other things, as I have seen in the nest, when it had young, remains of frogs. In a nest where there were two young about half-grown, the female having been killed, the male still continued to feed the young, and, on their attaining the proper size, undertook to teach them to fly. In the short twilight they would crawl to the mouth of the hole, where he seized them with (I could not see clearly) either beak or claws, and let them drop. This of course naturally made them spread their wings and come to the ground, when he again caught them up, lifting them some height, and dropped them again, when the effort was much more successful. The experiment was repeated several times with great success; but I could not see the finish, on account of the darkness."-T'. K. S.
379. Pulsatrix torquata (Daud.).

Cauca.
380. Ciccaba virgata (Cassin).

Concordia. (Mus. S.-G.)
381. Ciccaba albogularis (Cassin).

Rio Negro, Sta. Elena. (Mus. S.-G.).
Iris orange.
Eggs (no. 132) white : axis $1 \cdot 55$, diam. $1 \cdot 35$.
"I have invariably seen the nest on the ground amongst ferns or grass, with the exception of one; and in that case the egg was placed in the deserted nest of a small bird called here the 'sparrow.' The nest was built in a bush at some distance from the ground. The bird was sitting at the time; and the egg nearly filled the inside of the nest. This Owl seems to feed almost exclusively on beetles." -T. K. S.
382. Glaucidium jardinii, Bp.; Ridgway, Ibis, 1876, p. 4, pl. i.

Sta. Elena. (Mus. S.-G.)

## ACCIPITRES.

383. Circus hudsonicus (Lim.).

Medellin. (Mus, S.-G.)
384. Asturina magnirostris (Gm.); Scl. and Salv. Ex. Orn. p. 180.

Retiro, Concordia, Sta. Elena, Medellin, Remedios. (Mus.S.-G.)
Iris yellow.
Egg (no. 127) pinkish white, thickly blotched with red-brown and lilac spots at the larger or smaller end ; in some specimens the whole egg is freckled with reddish spots, the larger blotches being paler: axis $1 \cdot 85$, diam. $1 \cdot 5$.
"Builds a rather loosely made though massive nest in willow or poplar trees: it is usually lined with green willow-leaves. 1 have never seen more than one egg in a nest."-T. K. S.
385. Asturina leucorrioa (Quoy et Gaim.) ; Scl. et Salv. Ex. Orn. p. 180.

Concordia, Sta. Elena. (Mus. S.-G.)
Iris yellow.
386. Buteola brachyura (Vieill.).

Sta. Elena.
387. Buteo swainsoni, Bp. ; Ridgw. B. of N. Am. iii. p. 263.

One adult example in the eighth collection. (Mus. S.-G.)
388. Buteo pennsylvanicus (Wils).

Concordia, Envigado, Sta. Elena. (Mus. S.-G.)
389. Buteo hypospodius, Gurney, Ibis, 1876, p. 73, pl. iii.

Medellin. (Mus. S.-G.)
390. Buteo aldicaudatus, Vieill.

Sta. Elena and Rio Negro. (Mus. S.-G.)
391. Leucopternis semiplumbea (Lawr.) ; Scl. et Salv. Ex. Orn. p. 121, pl. 61; Salv. Ibis, 187, p.

Remedios. (Mus. S.-G.)
392. Geranoaïtus melanoleucus (Vieill.).

In Mr. Salmon's third collection. (Mus. S.-G.)
393. Spizaëtus ornatus (Daud.).

Remedios. (Mus. S.-G.)
Iris dark.
394. Spizaëtus isidorit (Des Murs).

In Mr. Salmon's third collection. (Mus. S.-G.)
395. Accipiter bicolor (Vieill.) ; Scl. et Salv. Ex. Orn. p. 137, pl. 69.

Remedios. (Mus. S.-G.)
396. Accipiter ventralis, Scl.; Scl. et Salv. Ex. Orn. p. 25. pl. 13.

Retiro, Concordia, Medellin, Remedios. (Mus. S.-G.)
Iris yellow.
397. Accipiter tinus (Lath.).

Remedios. (Mus. S.-G.)
Iris yellow.
398. Hypotriorchis columbarius (Linn.).

Medellin. (Mus. S.-G.)
399. Hypotriorchis rufigularis (Daud.). Neche.
400. Tinnunculus sparverius (Linn.).

Envigado, Concordia, Medellin, Sta. Elena. (Mus. S.-G.)
Eggs (no. 131) pale red, thickly mottled with a darker shade: axis $1 \cdot 42$, diam. $1 \cdot 1$.
"Builds on old buildings or holes of trees, laying four eggs."T. K. S.
401. Elanoides furcatus (Linn.)

Concordia, Neche. (Mus. S.-G.)
Iris dark.
402. Rostrhamus sociabilis (Vieill.); Gurney, Ibis, 1879,

Remedios.
Iris red.
403. Rostriamus hamatus, Temm.; Gurney, Ibis, 1879,
p. 340 .

Remedios. (Mus. S.-G.)
404. Cymindis uncinatus (Temm.).

Medellin. (Mus. S.-G.)
405. Ictinia plumbea (Vieill.).

Concordia, Remedios. (Mus. S.-G.)
Iris red. Insects in stomach.
406. Herpetotheres cachinnans, Vieill.

Cauca, Remedios.
Iris dark.
407. Ibycter americanus (Bodd.).

Medellin, Remedios, Neche.
408. Milvago chimachima (Vieill.).

Cauca. (Mus. S.-G.)
409. Polyborus cherrway (Jacquin.) ; Sharpe, Cat. i. p. 33.

Rio Negro. (Mus. S.-G.)
Lggs (no. 144) thickly freckled with red spots, and blotched at the larger or smaller end with patches of several darker shades of the same colour : axis $2 \cdot 3$, diam. 1•83.
"The only nest I obtained was made of a mass of sticks, and placed in a large tree about 50 feet from the ground."-T. K. S.
"Builds under an overhanging stone among the rocks, and lays two white eggs, very thickly spotted. It may choose other situations, as I have only known one nest."-T. K.S.
410. Cathartes aura (Linn.).

In the serenth collection.
Eggs creamy-white, spotted with evenly distributed small spots of several shades of red-brown : axis $2 \cdot 75$, diam. 1•9. (Mus. Brit.)
411. Cathartes atratus (Bartr.).

Eggs (no. 141) white, sparingly marked with rather large spots of several shades of red-brown and lilac: axis $3 \cdot 95$, diam. 2 .
"Builds a nest of a few sticks on the ground or under shelter of rocks."-T. K. S.
412. Gypagus papa (Linn.).

Several specimens.

## S'TEGANOPODES.

413. Plotus anhinga, Linn.

## HERODIONES.

414. Ardea candidissima (Gm.).

Cauca.
415. Butorides virescens (Linn.).

Medellin. (Mus. S.-G.)
416. Butorides cyanurus (Vieill.).

Remedios, Medellin. (Mus. S.-G.)
Iris yellow.
Egg (no. 109) pale greenish white: axis 1•4, diam. 1•1. (Mus. S.-G.)
417. Tigrisoma salmoni, Scl. et Salv. P. Z. S. 1875, p. 38.

Cauca and Medellin. (Mus. S.-G.)
418. Nycticorax gardeni (Gm.).

Medellin. (Mus. S.-G.)
419. Cancroma cochlearia, Linn.

Remedios.
Iris yellow.
420. Marpipion cayennensis (Gm.).

Neche.
Iris dark.

## ANSERES.

421. Querquedula discors (Linn.) ; Scl. \& Salr. P. Z. S. 1876, p. 383.

Medellin. (Mus. S.-G.)
This is the first time we have met with this species south of the Isthmus of Panama.
422. Spatula clypeata (Linn.); Scl. \& Salv. P. Z. S. 1876, p. 396.

Medellin. (Mus. S.-G.)
Not previously noticed south of Guatemala.
423. Merganetta leucogenys (Tsch.); Scl. \& Salv. P. Z. S. 1876, p. 408.

Frontino. (Mus. S.-G.)

## COLUMBæ.

424. Columba speciosa, Gm.

Remedios. (Mus. S.-G.)
" Iris red."
The egg (no. 124) is creamy white: axis $1 \cdot 45$, diam. $1 \cdot 02$.
"The nest, made of small sticks, is placed in high underwood."T. K. S.
425. Columba albilineata, G. R. Gray.

Retiro. (Mus. S.-G.)
"Makes a nest of sticks and twigs in high underwood in forest."
-T.K.S.
426. Columba rufina (Temm.).

Medellin.
Iris red.
427. Columba vinacea (Temm.).

Remedios. (Mus. S.-G.)
Food, fruit.
428. Columba subvinacea, Lawrence; Ann. Lye. N. Y. ix. p. 135 (1868).

Remedios. (Mus. S.-G.)
Food, fruit.
429. Zenaida ruficauda, Bp.

Retiro, Medellin, Remedios. (Mus. S.-G.)
Egg (no. 118) creamy white : axis $1 \cdot 18$, diam. $\cdot 9$.
"The nest is made of small sticks and twigs and placed in low bushes."-T. K. S.
430. Chamepelia rufipennis, Bp.

Medellin.
Iris yellow. Seeds in stomach. Nests in low bushes.
"The nest is composed of small twigs, grass, and leaves, and is placed on the outside of low bushes." ${ }^{\prime}$ T. K. S.
431. Peristera cinerea (Temm.).

Remedios.
Iris dark. Seeds in stomach.
"The nest is made of small twigs, and is exceedingly small and slight; it is placed on the outside boughs of low bushes."-T. $\boldsymbol{K}^{\prime}$.S.
432. Leptoptila verreauxi, Bp.

Retiro, Medellin.
Iris dark.
"The nest is made of sticks and twigs, and placed in underwood not very high."-T. K. S.
433. Geotrygon linearis (Knip et Prév.).

Sta. Elena. (Mus. S.-G.).
Iris yellow. Berries in stomach.

## GALLINE.

434. Penelope cristata (Linn.) ; Scl. \& Salv. P. Z. S. 1870, p. 525.

Remedios.
435. Aburria carunculata, Reich. ; Scl. \& Salv. P. Z. S. 1870, p. 530 .

Cauca, Frontino. (Mus. Brit.)
Eggs (no. 143) dirty white, texture rather smoother than usual in Cracidæ: axis 2•8, diam. 2.0.
436. Chamepetes goudoti (Lesson); Scl. \& Salv. P. Z. S. 1870, p. 531.

Retiro. (Mus. Brit.)
Eggs (no. 142) creamy white; texture rough : axis $3 \cdot 8$, diam. 2.
437. Ortalida guttata (Spix); Scl. \& Salv. P. Z. S. 1876, p. 536 .

Concordia, Sta. Elena. (Mus. S.-G.)
Iris red. Stomach contained fruit.
438. Eupsychortyx levcotis, Gould.

Medellin. (Mus. S.-G.)
Egg (no. 106) pale buff-white, spotted with large blotches of tawny; in some specimens freckled with small spots of this colour: axis 1-35, diam. 1 .
439. Odontophorus marmoratus, Gould.

Remedios. (Mus. S.-G.)
Iris dark red.
Egg (no. 153) white: axis $1 \cdot 5$, diam. $1 \cdot 1$.
"Builds its nest into a bank or side of the ground in the high forest, with a tunnel-like entrance made of interlaced twigs and sticks-or, perhaps more properly speaking, with a neatly exceuted bow in front of the nest, which is merely a hole scraped in the ground and lined with dead leaves.
" When wandering one morning in the forest, I saw a pair engaged in the work of nest-making. The male was in the nest; and the female appeared to be building around him. The female made off on my approach; but the male continued in the nest until I nearly put my hand on him, no doubt trusting to his dark colour amongst the dead leaves to escape detection. I do not think I should have seen him, had it not been for the scarlet over the eye."-T. K. S.
440. Odontophorus hyperythrus, Gould.

Odontophorus hyperythrus, Gould, P. Z. S. 1857, p. 223 ( © )
Odontophorus hypospodius, Scl. \& Salv. Nomencl. p. $162(1873)$, ㅇ.
Sta. Elena. (Mus. S.-G.)
Iris dark. Berries in stomach.
Additional specimens received from Mr. Salmon show that our O. hypospodius, based upon a specimen in one of his earlier collections, is simply the female of Mr. Gould's O. hyperythrus. One example is in intermediate plumage, and, though marked as a female, is probably a young male.

## FULICARI风.

441. Rallus nigricans, Vieill.; Scl. \& Salv. P. Z. S. 1868, p. 446.

Medellin. (Mus. S.-G.)
Iris red.
"Builds a nest of aquatic grasses amongst high grass in damp places, and lays three stone-coloured eggs with a few small spots."-T. $K . S$.
442. Aramides cayennensis (Gm.) ; Scl. \& Salv. P.Z.S. 1868, p. 447.

Remedios. (Mus. S.-G.)
Iris red.
443. Porzana carolina (Lim.); Scl. \& Salv. P. Z. S. 1868, p. 450.

Medellin. (Mus. S.-G.)
444. Porzana cayennensis (Gm.) ; Scl. \& Salv. P. Z. S. 1868, p. 451 .

Remedios. (Mus. S.-G.)
Egg white; axis 1.35, diam. .98.
Proc. Zool. Soc.-1879, No. XXXV.
"The nest is round like a ball, made of coarse grass stalks, lined and covered with grass bents and blades, and has a side entrance. It is built 3 or 4 feet from the ground amongst the densest coarse herbage and shrubs, in wild open parts where the forest has been cut down. For ascending and descending it forms a kind of ladder with a platform in front of nest. Lays but two eggs, and is exceedingly shy."-T. K. S.
445. Porzana albigulabis (Lawr.) ; Sel. \& Salv. P. Z. S. 1868, p. 454.

Remedios. (Mus. S.-G.)
Jris dark.
Egg (no. 110) pale buff-white, sparsely spotted with small red spots: axis $1 \cdot 1$, diam. $\cdot 9$.
"The nest is made of grass stalks and bents, and is round, with a side entrance, and placed amongst high grass and bushes in low swampy places, about two feet above the ground or water."- T. K. S.
446. Porphyrio martinicus (Lim.); Scl. \& Salr. P. Z. S. 1868, p. 459.

Medellin. (Mus. S.-G.)
Iris red.
"Builds a nest of flags and grass amongst reeds by the water's edge."-T'. K. S.
447. Gallinula galeata (Licht.) ; Scl. \& Salv. P. Z. S. 1868, p. 462.

Antioquia. (Mrus. S.-G.)
"The nest is composed of flags and dried grasses, and is placed on low overhanging branches or amongst reeds." -T. K. S.
448. Heliornis fulica (Bodd.); Scl. \& Salv. P. Z.S. 1868, 1. 469 .

## ALECTORIDES.

449. Eurypyqu major, Hartlaub.

Neche.
Iris dark.

## LIMICOLE.

450. Parra hýpomlelena, Gray.

Antioquia, Sta. Elena. (Mus. S.-G.)
Iris dark. Stomach contained insects.
Egg (no. 123) olive, thickly streaked with broad black lines, crossing one another in all directions: axis $1 \cdot 2$, diam. $\cdot 9$.
451. Vanellus cayennensis (Gm.).

Retiro, Concordia, Frontino. (Mus. S.-G.)
Iris red.
Egg (no. 126) olive-brown, spotted with brownish-black spots of
various sizes and shades, especially near the larger end: axis $1 \cdot 8$, diam. 1•32.
"Makes no nest, but lays its four eggs in a depression in the ground."-T. K. S.
452. Charadrius virginicus, Bechstein, Latham's Allg. Ueb. iv. pt. 2, p. 455 (1812).

Medellin. (Mus. S.-G.)
453. Egialitis vocifera (Linn.).

Medellin. (Mus. S.-G.)
454. Gallinago wilsoni (Temm.).

Medellin. (Mus. S.-G.)
455. Gallinago nobilis, Scl.

Retiro. (Mus. S.-G.)
Eggs brownish-olive, spotted with several shades of dark brown, especially at the larger end: axis $1 \cdot 8$, diam. $1 \cdot 3$.
"The nest is placed on the ground in marshy places."-TT. K. S.
456. Macrorhamphus griseus (Gm.).

Medellin. (Mus. S.-G.)
457. Tringa bairdi, Coues.

Medellin. (Mus. S.-G.)
458. Gambetta melanoleuca (Gm.).

Cauca, Medellin. (Mus. S.-G.)
459. Gambetta flavipes (Gm.)

Medellin. (Mus. S.-G.)
460. Rhyacophilus solitarius (Wilson).

Medellin.
Iris dark. Insects in stomach.
461. Tringoides macularius (Linn.).

Retiro.
462. Actiturus longicauda (Bechst.).

Tringa longicauda, Bechstein, Latham's Allg. Ueb. iv. pt. 2, p. 453, t. 42 (1812).

Actiturus longicauda, Dresser, B. of Europe.
Actiturus bartramius, Scl. et Salv. Nomencl. p. 146.
Medellin. (Mus. S.-G.)
463. Tryngites rufescens (Vieill.).

Remedios. (Mus. S.-G.)

## PYGOPODES.

464. Tachybaptus dominicus (Linn.).

Antioquia. (Mus. S.-G.)
Iris yellow.
Egg (no. 125) dirty white: axis $1 \cdot 2$, diam. $\cdot 9$.
"The nest is placed by the water's edge."-T. K.S.

## CRYPTURI.

465. Tinamus ruficeps, Scl. \& Salv. Nomencl. p. 162.

Remedios. (Mus. S.-G. Egg Mus. Brit.)
Egg nearly round, Sèvres-blue: axis 2.2, diam. 1.9.
"No nest is formed, merely a depression amongst dead leaves on the ground at the foot of a large tree in the high forest. The bird does not appear to run from her nest on the approach of a person, but rises on the wing with a loud whirring noise, almost at your feet." -T. K.S.

## 466. Nothocercus bonapartil (Gray).

Concordia, Frontino. (Mus. S.-G.)
Iris dark. Stomach contained fruit.
Egg rather elongated, rich dark Sèvres-blue: axis 2:8, diam. 2.
"This Tinamou makes a nest of dead leaves on the ground at the foot of a tree; I have seen one on the top of a broken tree. It has the same habits as Tinamus ruficeps."-T. K.S.
467. Crypturus boucardi, Sclater.

Neche. (Mus. S.-G.)
The single specimen is rather more rufous on the cheeks; but there is no difference sufficient to justify separation. The most southern locality hitherto known for this species is Costa Rica (Carmiol, in Mus. S.-G.).
468. Crypturus pileatus (Bodd.).

Cauca. (Mus. S.-G.)
Egg (no. 128) uniform pale chocolate: axis 1•3, diam. 1•23.
"Builds a nest of dead leaves on the ground, and lays two egg." -T. K. S.
"Strictly speaking this nest has no materials, as it is simply a depression on the ground amongst dead leaves."-T. K.S.

## V. General Conclusions.

Mr. Salmon's collections, embracing examples of 468 species, although they do not certainly exhaust the rich avifauna of Antioquia, give us a sufficient basis for the deduction of a few conclusions respecting its general facies, which may be stated as follows:-

1. The avifauna of Antioquia is, on the whole, most nearly allied to that with which we have become acquainted from the
study of "Bogotn" collections. It must be recollected, however, that "Bogota" collections contain a certain number of specimens from the southern slopes of the Columbian Andes and, therefore, strictly belonging to the Amazonian fauna.
2. In cases where the Bogotá species has a specifically distinct representative form in Ecuador, the Antioquian species generally belongs to the latter, or, at any rate, shows more resemblance to it; c. g.:

| Bogota. | Antioquia. | Ecuador. |
| :--- | :--- | :--- |
| Cinnicerthia unirufa. | C. unibrunea (?). | C. unibrunnea. |
| Compsocoma victorini. | C. sumptuosa. | C. sumptuosa. |
| Ostinops sincipitalis. | O. atrocastaneus. | O. atrocastaneus. |
| Miasius chrysopterus. | M. coronulatus (?) | M. coronulatus. |
| Rupicola peruviana. | R. sanguinea. | R. sangrinea. |
| Cynanthus cyanurus. | C. mocoa. | C. mocoa. |
| Andigena nigrirostris. | A. spilorhynchus. | A. spilorhynchus. |

3. A certain number of Ecuadorian species, which do not occur in Bogotá collections, are found in Antioquia. Such are:-

Cyphorinus phreocephalus. Thryothorus nigricapillus. Diglossa brumneiventris. Iridornis porphyreocephala. C`eurgops verticalis. Tachyphonus delattrii. Buarremon castaneiceps.

Saltator atripennis. Cnipodectes subbrunneus. Synallaxis erythrops. Androdon aquatorialis. Phaëthornis syrmatophorus. Momotus aquatorialis.
4. A certain number of species, hitherto only known from Panama or the adjacent districts, and not yet received from Bogotá, intrude from the north into the Antioquian avifauna. These are, for example :-

Dacnis venusta.
Euphonia fulvicrissa.
Calliste larvata.

- icterocephala ${ }^{1}$.

Pyranga testacea.
Orthogonys olivaceus.
Eucometis cassini.
Ostinops guatimozinus.
Chiromacharis vitellina.
Aulia rufescens.
Lipaugus holerythrus.
Lathra unirufa.

Automolus pallidigularis. Dendrornis lacrimosa. Rhamphocernus cinereiventris. Heliothrix barroti. Celeus loricatus ${ }^{1}$. Trogon chionurus. Bucco subtectus ${ }^{1}$. - pectoralis. Monasa pallescens. Capito maculicoronatus. Leucopternis semiplumbea. Crypturus boucardi.

## EXPLANATION OF THE PLATES.

Plate XLI.
Cyphorhinus dichrous, p. 402.

[^41]Plate XLII.
Fig. 1. Egg of Diglossa personata, p. 496.
2. ", Calliste vitriolina, p. 498.
3. " Rhamphocelus flammigerus, p. 501.
4. " Phळnicothraupis gutturalis, p. 502.
5. ", Tachyphonus melateucus, p. 503.
6. ", Chlorospingus flavipectus, p. 503.
7. ", Buarremon elcoprorus, p. 504.
8. " Psittospiza riefferi, p. 504.
9. ", Saltator albicollis, p. 505.
10. " Chiromacharis vitellina, p. 517.
11. " - manacus, p. 517.
12. " Hadrostomus homochrous, p. 517.

Plate XLIII.
Fig. 1. $\}$ Eggs of Ostinops atrocastancus, p. 509.
3. " Ocyalus wagleri, p. 508.
4. "Hypopyrrhus pyrrhogaster, p. 510.
5. ", Grallaria ruficeps, p. 526.
6. ", -ruficapilla, p. 527.
7. „ Pyroderus orenocensis, p. 520.
8. " Pipreola rieffcrii, p. 510.
9. ". Dysithamnus unicolor, p. 525.

June 17, 1879.
Prof. W. H. Flower, F.R.S., President, in the Chair.
The Secretary made the following report on the additions to the Society's Menagerie during May 1879 :-

The total number of registered additions to the Society's Menagerie during the month of May was 183, of which 16 were by birth, 46 by presentation, 104 by purchase, 4 were received in exchange, and 13 on deposit. The total number of departures during the same period, by death and removals, was 114.

The most noticeable additions during the month were:-

1. Two Horned Parrakeets (Nymphicus cornutus), purchased May 8th.

This Parrakeet is exceedingly rare, even in museums, and, so far as I know, has never been previously brought alive to Europe. The person from whom they were purchased obtained them in Sydney, where they were no doubt brought from New Caledonia, the only known habitat.

As will be seen from Mr. Smit's sketch of this beautiful bird, which I now exhibit (Pl. XLIV.), the figure in Gray and Mitchell's 'Genera of Birds ' (plate ci.) is incorrect--the black colour on the face being wholly omitted, and the yellow on the back of the head barely shown.
2. An African Hornbill received in exchange May 8th, which appears to be a sccond example of the species described (P.Z.S. 1870, p. 668, plate xxxix.) as Buceros subcylindricus. Unfortunately

its tail is imperfect, so that I am at present unable to solve Mr. Elliot's doubts ${ }^{1}$ as to the validity of the species.
3. A young male Patagonian Sea-lion (Otaria jubata), presented by F. E. Cobb, Esq., Manager of the Falkland-Islands Company, at Stanley, Falkland Islands, May 20th. This is a most acceptable present, as we have at present only two female Otarice in the Gardens, and these animals thrive and breed in captivity.

The new animal is believed to be about two years old, and was captured in the Falkland Islands in March last. At present he is considerably inferior in size to the two females, being not more than 4 feet in length.
4. A Saki Monkey (Brachyurus), purchased May 24th.

This Monkey we purchased as an example of Brachyurus rubicundus ${ }^{2}$, and probably belongs to that species, although it does not quite agree with the published descriptions and figures. An accurate examination of it can only be made after the death of the animal, when a further notice of this rare species shall be given.

Mr. Sclater exhibited a skin of Ara glauca (Vieill.) from Corrientes, belonging to M. Boucard's collection, and stated that, after comparing it with the bird in the Society's Gardens, purchased in June 1860, and named in the 'List of Vertebrates' (1877, p. 240) Ara glauca, he had come to the conclusion that the latter bird was certainly not an example of Ara glauca, but belonged to the allied form Ara leari ${ }^{3}$, readily distinguishable by its larger size and intense blue colouring, almost as fine a blue as in Ara hyacinthina.

The two species were well represented and distinguished in Souance's ' Perroquets,' pl. i.

There were, therefore, four species of wholly blue Aras, namely:-

1. Ara hyacinthina, es Amazonia inf.
2. $A$. leari, Bp., ex patr. ign.
3. A. glauca (Vieill.), ex Paraguaya.
4. A. spixi, ex Brasilia boreali.

Of all these, except $A$. glauca, the Society's collection now contains living examples.

Prof. Flower laid before the Meeting the skull of the female Otrria lately living in the Southport Aquarium (exhibited at the last meeting by Mr. Jackson), and stated that it belonged to the species originally described by Dr. McBain in the Proceedings of the Royal Physical Society of Edinburgh (vol. i. p. 122 ; meeting of Feb. 24th, 1858) as Otaria gillespii. The original specimen was obtained from California-as was the present example, and others now living in the Brighton Aquarium and in several menageries on the Continent. A fine skeleton of this species from Japan had long

[^42]been in the Leiden Museum, and had been figured by Schlegel in the 'Fauna Japonica' under the name of $O$. stelleri.

Mr. C. G. Danford exhibited and made some remarks on some remarkable antlers of Deer, which he had obtained during his recent journey in Asia Minor.

Hans, Graf yon Berlepsch, C.M.Z.S., exhibited and made remarks on the skins of two varieties of the Long-tailed Titmouse (Mecistura caudata), which occurred near Cassel, in Gcrmany, one of which appeared to be the same as the British form of this bird.

Dr. J. Murie read a paper on the Manatee (Manatus americanus), containing the results of his examination of the specimen which was lately living in the Westminster Aquarium. The peculiar attitudes assumed by the animal in life, the great mobility of the upper lip, and the occasional use of the limbs in feeding were noted. As regards the anatomy, the chief points dwelt on were the shape of the brain and its suppressed convolutions. The vesed question of the number of the cervical nerves and their distribution was also discussed.

This paper will be printed in the Society's 'Transactions.'
Mr. F. D. Godman exhibited and made remarks on a drawing of the Manatee by Mr. Wolf, taken from the specimen lately living in the Westminster Aquarium.

Prof. Newton, on behalf of Mr. Edward Newton, C.M.G., Corresponding Member, exhibited some bird-skins obtained by the latter in Jamaica, remarking:-
"Of the specimens on the table tro belong to as many species which I belicese have not before been recorded as occurring in Jamaica. One of them, the well-known Dendroce virens, has so wide a distribution that the only wonder is that it has not hitherto been met with there; but the other is of more interest. It is that which was originally described by Audubon (Orn. Biogr. ii. p. 563) under the name of Sylvia swainsoni, and was subsequently referred by the same author (B. Am. ii. p. 83) to a new genus, Helinaia, a word which Agassiz says should be written Helonaa. It is an extremely rare species; and I doubt whether a second example has ever been seen in this country. The present was killed by my brother at Hope, in the parish of St. Andrew, February 8th, 1879, and was found by him to be a male. I am indebted to the kindness of Mr. Ridgway, of the Smithsonian Institution, for the determination of this specimen of a species I never saw before. It is well figured in Audubon's great work.
"I have then to exhibit specimens of the rare Dendroca pharetra, first discovered by Mr. Gosse in Jamaica, to which island it is doubtless peculiar. These are of some interest as showing the nestling or at least immature stage of the plumage, which, as will be perceived, is of an olive-green and yellow instead of the black and white of the


$$
\begin{gathered}
\text { MOLIUSCA OF THE LIGHTNING AND } \\
\text { PORCUPINE EXPEDITIONS. }
\end{gathered}
$$


(1.
adult. This fact, hitherto apparently unmentioned, naturally caused my brother and myself some cinbarrassment in naming these young birds : but at last we separately came to the conclusion that they were examples of this insular species; and our opinion has been fortified by the opinion of two such gcod authorities as Mr. Salvin and Mr. Ridgway, who have seen the specimens and given their judgment independently."

Prof. Garrod, F.R.S., read a paper on the brain and other parts of the Hippopotamus (Hippopotamus amphibius).

The author having had the opportunity of studying the brain of the adult male Hippopotamus presented to the Society by the late Viceroy of Egypt on May 25th, 1850, which died (apparently of old age) on March llth, 1878, described it at some length, other accounts, by Gratiolet and Macalister, having been based upon the dissection of new-born individuals.

Basing his description upon the nomenclature adopted by Dr. Ureng in an important recent memoir on the brain in the Ungulata ${ }^{1}$, it was shown by the author that in the comparatively simple brain of the Hippopotamus, besides the great number of bridging convolutions laid so much stress on by Gratiolet, the middle gyrus of the outer surface of the cerebral hemisphere was peculiarly broad and bent by minor folds, at the same time that the fissura lateralis was continuous with the more anteriorly situated coronal fissure. The considerable differences between the brains of Hippopotamus and Sus were pointed out, as well as the characterizing features of the former.

The enormous stomach of the adult was stated to be 11 feet in length, at the same time that its position was different from that of most animals, its long axis corresponding with that of the body.

The particularly simple and transversely elongated liver, with its, lengthy gall-bladder, was also described in detail.

This paper will be published entire in the Society's 'Transactions.'
The following papers were read :-

1. On the Mollusca procured during the 'Lightning' and 'Porcupine' Expeditions, 1868-70. (Part II. ${ }^{2}$ ) By J. Gwyn Jeffreys, LL.D., F.R.S., F.Z.S.
[Received June 5, 1879.]
(Plates XLV., XLVI.)
Preliminary remarks.
References will be given not only to the original authority for each species, but also to a figure in some recognized publication, in default

[^43]of which the plates which accompany this paper will supply the necessary illustrations. I consider it useless to add every synonym, a kind of work that serves no other purpose than to display the industry of the writer. For the same reason the authority for any locality mentioned in this paper is omitted, although I am prepared to name it. The position of each station, and the corresponding depth will be found in the introduction to the first part.

I prefer describing new species in my own language, instead of in dog-latin; and of course my continental friends are entitled to a similar privilege. The time has long passed since a knowledge of any of the principal languages of Europe was confined to its own country, when it was thought desirable to substitute Latin in scientific treatises. It should also be borne in mind that English is much more geuerally spoken and used than any other language in the civilized world. Latin cannot be applied with sufficient precision and intelligibility to the description of Natural-History specimens. For instance, we know next to nothing of the colours designated by classical names; yet conchologists do not hesitate to use such barbarous words as "griseus," "ochroleucus," "spadiceus," "aurantius," and "olivaccus," which appear in the works of Philippi and other authors of repute, but not in any good Latin dictionary.

The present work will form an additional supplement to 'British Conchology,' so far as regards our native Mollusca.

## CONCHIFERA.

Family I. Anomides.

## 1. Anomia ephippium, Linné.

Anomia ephippium, L. Syst. Nat. ed. xii. p. 1150: British Conchology, ii. p. 30, pl. i.f. 4; v. p. 165, pl. xx. f. l.
'Lightning' Expedition: Stations 2, 3, 4, 5.
'Porcupine' Exp. 1869: St. 1, 3, 13, 14, 18, Loch Foyle, 39, 47, 70. 1870: Atlantic, 1, 2, 3, 6, 8, 9, 10, 12, Vigo Bay, 16, 17, 17a, 24, 26, 27, 28, 28a, 29, 30, 36; Mediterraneat, 45, Саро de Gata, 50, Gulf of Bona, G. Tunis, Adventure Bank. Variously shaped and sculptured. A specimen of the variety aculeata is partly smooth, and in that respect exactly like the young form or squamula; the variety cylindrica in Stations 1 of 1869 and 1870 was attached to the spines of Cidaris papillata. In some of the specimens the byssal orifice is unusually small.

Distribution. Type and varieties. Iceland to Egypt and Madeira, Labrador to Long Island Sound, 'Challenger' Exp. (coast of Brazil), Corea. Depths, low water to 1450 fathoms.

Fossil. Pliocene and Post-tertiary. Scandinavia, Great Britain and Ireland, Belgium, Vienna Basin, South of France, Italy, Morea, Rhodes, Nantucket I. Heights $0-460$ feet.

Professor Verrill has lately separated the North-American form from ours under the specific name glabra; but I camot detect any characteristic difference between them. This makes the 36th
synonym. The opinion that this mollusk is of a poisonous nature when eaten (B. C. ii. p. 32) has been confirmed by Dr. Hidalgo, who says that at Mahon it is called "ostia borda deveri" for that reason.
2. Anomia patelliformis, Limé.

Anomia patelliformis, L.S. N. p. 1151 : B. C.ii. p. 34; v. p. 165, pl. xx. f. 2.
'Lightning' Exp. : off the Faroe I.
'Porcupine' Exp. 1869: St. 2, 9, Galway B., 23a, The Minch. A specimen is marked like Amussium hoskynsi in an imbricated fashion. 1870 : Atl. 29, Tangier B.; Med., Cartagena B.

Distribution. Faroe I. to Mediterranean and Adriatic, N. W. America; 0-420 fms.

Fossil. Pliocene and Post-tertiary. Scandinavia, Great Britain and Ireland, Belgium, Vienna Basin, and Italy ; 4-130 ft.

Seventeen synonyms, including Ostreum striatum of Da Costa, and A. striata of Brocchi and Lovén.

## Family II. Ostreide.

1. Ostrea edulis, Limué.
${ }^{〔}$ Ostrea edulis, L. S. N. p. 1148: B. C. ii. p. 38, pl. i. f. 5 ; r. p. 165 , pl. xxi. f. 1.
'Porcupine' Exp. 1869 : St. 6, 9, Galway B. Valves of young shells, one being deeply concave, and resembling $O$. cochlear. 1870: Atl. Cadiz; Var. parasitica, Med., Capo de Gata and Cartagena B.

Distribution. Iceland to Mogador, Mediterranean and Adriatic, Sea of Azof, Nova Scotia and Newfoundland ; $0-4 \bar{j}$ fms.

Fossil. Pliocene and Post-tertiary. Scandinavia, Great Britain and Ireland, Holland, Belgium, Germany, Vienna Basin, S. France, Italy, Algeria, Turkey in Europe ; 0-1360 ft.
'ithe synonyms are numerous, owing to the extreme variability of the shell.
\& 2. Ostrea cochlear, Poli.
O. cochlear, Poli, Test. utr. Sic. ii. p. 179, t. xxviii. f. 28.
'Porcupine ' Exp. 1869 : St. 1, 35. 1870 : Atl. 10, 13, Setubal B., off Cape Sagres, 26, 36 ; Med. Cartagena B., $50,50 a$, off Jijeli, 55, G. Bona, Benzert Road, Rasel Amoush, G. Tunis, and Adventure Bank. Some small and young specimens are intermediate between this species and O. edulis; and I am by no means satisfied that the two are distinct. O. cochlear inhabits deeper and more still waters than $O$. edulis; and it is attached to corals, shells, and other organisms, being often clustered together.

Distribution. Atlantic coasts of France and Lusitania, the Mediterranean, Adriatic, 历gean, and Canaries; $40-205 \mathrm{fms}$. The depth at which it was affixed to the Cagliari-Bona submarine cable, and noticed by Professor Alphonse Mine-Edwards, is doubtful.

Fossil. Pliocene. Coralline Crag (as O. spectrum), Belgium, Viema Basin, Biot, Italy, Algeria, and Morea.

Family III. Sponnylide.
Spondylus gussoni, O. G. Costa.
S. gussonii, O. G. Costa, Cat. Sist. p. xlii : Philippi, Moll. Sic. i. p. 87, t. v. f. 16.
'Porcupine' Exp.'. 1870 : Atl. St. 16, 24, 25 ; Med. 45, Capo de Gata, 58.
Distribution. Mediterranean, Adriatic, and Ægean; 40-120 fms.
Fossil. Pliocene. Metz, Biot, Sicily.
S. goderopus did not occur ; and it will be seen that many other equally common shells were not procured during any of these Expeditions.

Family IV. Pectinide.

1. Pecten pusio, Linné.

Ostrea pusio, L. S. N. 1146.
P. pusio, B. C. ii. p. 51 ; v. p. 166, pl. xxii. f. 1.
'Lightning' Exp.: St. 4.
'Porcupine' Exp. 1869: 2. 1870: Atl. Vigo B., 36 (Hinnites form), Tangier B. ; Med. Capo de Gata, 55.

Distribution. Faroe Isles to Morocco and the Mediterranean, Adriatic, Egean, Madeira, Canaries, Azores, and S. Africa; 0-180 fms.

Fossil. Pliocene and Post-tertiary. Scandinavia, Great Britain and Ireland, Belgium, Transylvania, S. France, Algiers, Italy, and Rhodes ; 0-130 ft.

Several synonyms, including $P$. distortus of Da Costa and $P$. multistriatus of Poli.

I have here endeavoured, as on former occasions, to arrange the species in their natural sequence, so as to show their relative affinity.

In the 'Porcupine' Expedition of 1870, I dredged at Station 9 ( 509 fms.) a fragment of a Pecten, apparently allied to $P$. pusio, but representing a shell about an inch and a half in length, and at Station 16 ( 994 fms .) a very small valve of the same species. It has numerous ribs, which are alternately larger and smaller, and covered with numerous close-set prickles or imbricated scales. I would provisionally name this species senticosus.
2. Pecten varius, Linné.

Ostrea varia, L. S. N. p. 1146.
P. varius, B. C. ii. p. 53 ; v. p. 166, pl. xxii. f. 2.
'Porcupine' Exp. 1869 : Loch Foyle. 1870: Atl. Tangier B.
Distribution. Christiansund to Egypt and Gulf of Suez; 0-55 fms.
Fossil. Miocene. Turin. Pliocene and Post-tertiary. Scandinavia, Great Britain and Ireland, S. France, Italy, Algeria, Morea, and Rhodes; 0-150 ft.
3. Pecten islandicus, Müller.
P. islandicus, Müll. Zool. Dan. Prodr. p. 248: G. O. Sars, Moll. reg. arct. Norv. t. 2. f. 2.
'Porcupine' Exp. 1869 : St. 25 (fragments; semifossil?).

Distribution. Arctic seas in both hemispheres, southwards to Bergen and Connecticut, N. Japan; 2-150 fms.

Fossil. Pliocene and Post-tertiary. Scandinavia, Scotland, Russia, Gulf of Naples (B. C. v. p. 166), Messina; 20 fms. -470 ft .

## 4. Pecten pes-relis, Linné.

$\checkmark$ Ostrea pes-felis, L. S. N. p. 1146: Chemnitz, Conch.-Cab. vii. t. 64. f. 612, t. 65. f. 613.
' Porcupine' Exp. 1870: Tangier B. (young).
Distribution. G. Gascony to Morocco, Mediterranean, Adriatic, Ægean, Madcira, and Canaries, 'Challenger' Exp. (Fiji Islands); 18-110 fms.

Fossil. Pliocene, Italy, Morea, and Rhodes.
5. Pecten pes-lutree, Linné.

Ostrea pes-lutra, L. Mant. Plant. p. 547.
P. septem-radiatus, B. C. ii. p. 62 ; v. p. 166, pl. xxiii. f. 1, la
'Lightning' Exp.: St. 2, 4, off Faroe I. (very large valve).
'Porcupine' Exp. 1869: St. 3, 6, 15, 23, 23a, 25, 65. 1870 : Atl. 1, 2, 3, 6 (var. alba ), 8, 9, 10, 13, 16, 17, 26-30; Med. Capo de Gata, Cartagena B., G. Bona, Benzert Road, Rasel Amoush, G. Tunis, Adventure Bank, off Rinaldo's Chair.

Distribution. Finmark to the Sea of Marmora, and the Adriatic ; $10-300 \mathrm{fms}$.

Fossil. Pliocene and Post-tertiary. Scandinavia, Great Britain and Ireland, Belgium, Vienna Basin, S. France, Africa, Italy, and Rhodes ; 0-440 ft.

There are at least a dozen synonyms for this variable species, including P. septemradiatus, Müller, Ostrea inflexa, Poli, and $\boldsymbol{P}$. dumasii, Payraudean. The last named variety agrees more nearly with Linné's description of Ostrea pes-lutre in having very small ears, "Auriculce vix ullæ s. altera minuta." The Linnean name appears to have been first recognized and adopted by the late $M$. Gay in his 'Catalogue des Mollusques du Département du Var,' 1858. The editors of the 'Journal de Conchyliologie' object to compound names of species; but we have the great authority of Linné for many such names. As to the names of species derived from English persons, unnecessary confusion is avoided by using their ordinary compound names, e.g. Wyville-Thomson, the simple surname Thomson being very common and belonging to several naturalists.
6. Pecten sulcatus, Müller.
P. sulcatus, Müll. Zool. Dan. Prodr. p. 248.
P. aratus, B. C. ii. p. 64; v. p. 167, pl. xcix. f. 5.
'Lightning' Exp. : Station 4.
'Porcupine' Exp. 1869 : St. 13, 14, 25, 65. 1870: Atl. 1, 2, 3, 24-30; Med. 45, Capo de Gata, Adventure Bank. In some specimens, as well from the Atlantic as from the Mediterranean, the ribs are more knotty or tuberculous than in others.

Distribution. Loffoder I. to the Morea, Malta, and the Adriatic ; 20-470 fms.

Fossil. Pliocene and Post-tertinry. Coralline Crag, Belgium, Biot, Messina ; 0-30 ft.

Ostrea arata of Gmelin and P. bruei of Payraudeau. When I adopted Gmelin's specific name, I overlooked the relative dates of Mixiller's and Born's publications ; that of Müller is anterior by two years, viz. 1776, while Born's was 1778. Miiller's description, although short, is unmistakable.
7. Pecten opercularis, Linné.

Ostrea opercularis, L. S. N. p. 1147.
$P$. opercularis, B. C. ii. p. 59, pl. ii. f. 1 ; v. p. 166, pl. xxii. f. $3,3 a$.
' Lightning' Exp.: St. 4.
' Porcupine' Exp. 1869: St. 2, 33, 35. 1870 : Atl. 1, 2, 3, 8, 9, 10, Setubal B., C. Sagres, 26, 36, 'langier B.; Med. 50, 55, G. Bona, Benzert Road, Rasel Amoush, G. Tunis, Adventure Bank, off Rinaldo's Chair. Specimens have a more or less strongly imbricated sculpture.

Distribution. Iceland to the Sea of Marmora, Adriatic, Madeira, Canaries, and the Azores ; 5-205 fms. The depth recorded for the variety audouinii from the Mediterranean cable is questionable.

Fossil. Pliocene and Post-tertiary. Scandinavia, Great Britain and Ireland, Belgium, N. Germany, S. France, Italy, Algeria, Morea, Rhodes, Madeira; 0-600 ft.
8. Pecten philippii, Récluz.
P. philippii, Récl. Journ. de Conch. iv. p. 52, t. ii. f. 15, 16 (1853).
'Porcupine' Exp. 1870 : Atl. St. Setubal B., C. Sagres, 26, 36 ; Med. 50, Benzert Road, Rasel Amoush.

Distribution. Mediterranean, Adriatic, Madeira, Canaries; 20100 fms .

Fossil. Pliocene. S. Italy and Rhodes.
Distinguishable from $P$. opercularis by its smaller size, more convex or gibbous shape, broader and flattened ribs, and smaller ears. Monterosato altered the specific name to commutatus, because philippii had been used by Michelotti praviously to Récluz for another and a fossil species; but, as Brugnone has lately pointed out, Michelotti's species belong to Pleuronectia or Amussium. According to Hörnes, that species is the Pecten duodecimlamellatus of Bronn, which has precedence of Michelotti's name by eight years.

[^44]Distribution. Christiansund to Sicily, Madeira, and the Canaries; laminarian zone to 78 fms .

Fossil. Upper and middle Pliocene and Post-tertiary. Scandinavia, Great Britain and Ireland, IIolland, Belgium, S. France, Italy, Algeria; 0-1 06 ft .

It is difficult to separate $P$. maximus from $P$. jacobous. Are they distinct species?

- 10. Pecten flexuosus, Poli.

Ostrea flexuosa, Poli, Test. utr. Sic. ii. p. 161, t. xxviii. f. 11.
'Porcupine' Exp. 1870 : Atl. St. 29 ; Med. Benzert Road, Rasel Amoush.

Distribution. Loire-Inférieure, Atlantic coast of Spain, Portugal, Strait of Gibraltar, Mediterranean, Adriatic, Egean, Madeira; 2110 fms .
Fossil. Miocene, Pliocene, and Post-tertiary. S. France, Algeria, and Italy.
P. polymorphus of Bronn and Philippi.

- 11. Pecten glaber, Linné.

Ostrea glabra, L. S. N. p. 1146.
O. citrina, Poli, Test. utr. Sic. ii. t. xxviii. f. 15.
'Porcupine' Exp. 1870 : Atl. St. 30 ; Med. Algesiras B.,
Distribution. Portugal to Smyrna, Adriatic, Black Sea, and the Crimea; $2-120 \mathrm{fms}$.

Fossil. Pliocene. S. France, Algeria, Italy, Morea.
Ostrea sulcata of Born, and many other synonyms.
12. Pecten tigrinus, Müller.
P. tigerinus, Müll. Zool. Dan. Prodr. p. 248.
P. tigrinus, B. C. ii. p. 6 § ; v. p. 167, pl. xxii. f. 2, $2 a$.
'Lightning' Exp.: St. 2, 5.
'Porcupine' Exp. 1869 : St. 23a, 33, 68, the Ninch. 1870: Atl. Setubal B.

Distrilution. Iceland and Norway to Vigo; 5-180 fms.
Fossil. Pliocene and Post-tertiary. Norway, Great Britain, Belgium ?, Biot, Barcelona, Calabria, and Sicily ; 0-130 ft. I give. the Belgian localities for this and some other species with considerable hesitation, because I have not yet succeeded in having an opportunity of critically examining and comparing the Belgian fossils which bear the names of recent species. I have already shown (B. C. v. p. 175) that the Arca pectunculoides of Nyst, from the "sable noir" of Antwerp, is very different from the recent species of that name.
13. Pecten striatus, Müller.
P. striatus, Miull. Zool. Dan. Prodr. p. 248 : B. C. ii. p. 69 ; v. p. 168, pl. xxiii. f. 4.
'Porcupine' Exp. 1869 : St. 6, 9, Galway B., 14, 45a, 45b, 70, Little Minch, near Belfast, off Lerwick.

Distribution. Finmark and Faroe I. to Sicily ; 5-180 fms.
Fossil. Pliocene and Post-tertiary. Scandinavia, Red Crag at Woodbridge, Biot, Italy ; 0-130 ft.

Among other synonyms is $P$. rimulosus of Philippi, who identified it with the present species in his letter to Scacchi in 1844. It is not the $P$. striatus of $\nabla$. Münster, from the Tertiaries of N. W. Germany.

## 14. Pecten teste, Bivona.

P. testre (Bivona MS.), Philippi, Cat. Moll. Sic. i. p. 11, t. v. f. 17 : B. C. ii. p. 67 ; v. p. 167, pl. xxiii. f. 3.

- Porcupine' Exp. 1869 : St. 2, 6, 23a, 25.1870 : Atl. Vigo B., Tangier B. ; Med. off Jijeli, Benzert Road.

Distribution. Norway to the Egean, and the Adriatic ; 10-130 fms. The depth from which the Mediterranean cable was recovered, with the specimen attached to it, depending on the information received by Prof. A. Milne-Edwards, is doubtful.

Fossil. Pliocene. Biot, Monte Mario, and Sicily.

## 15. Pecten similis, Laskey.

P. similis, Lask. Mem. Wern. Soc. i. p. 387, t. viii. f. 8. : B. C.ii. p. 71; v. p. 168, pl. xxiii. f. 5.
'Porcupine' Exp. 1869: St. 1, 3, 6, 9, Galway B., 13, 14, 18, 25, 33, 35. 1870: Atl. 1, 2, 3, 10, 12, Vigo B., 16, 17a, Setubal B., off C. Sagres, 27-30; Med. Cartagena B., Rasel Amoush (one valve, striated inside more distinctly than usual, and named by me Pleuronectia lavis), Adventure Bank, off Rinaldo's Chair.

Distribution. Finmark to the Gulf of Egina, Adriatic, Madeira, Jamaica, and Corean Sea; 2-300 frms.

Fossil. Pliocene and Post-tertiary. Coralline Crag, Glacial bed in Fifeshire, Belgium, Plaisantin, S. Italy, Rhodes.

Not P. pygmereus of v. Münster, which is a species of Amussium.
16. Pecten groenlandicus, G. B. Sowerby.
P. groenlandicus, G. B. Sowerby, Thes. Conch. part ii. p. 57, pl. xiii. f. 40 (1842).
'Porcupine' Exp. 1869 : St. 23a, 40, 47. 1870: Atl. 6, 8, 9. Young only, and in this state closely resembling $P$. similis; but the sculpture is very different. The latter species is marked by concentric strix in both valves, while $\boldsymbol{P}$. groenlandicus has in the upper valve numerous impressed lines, arranged lengthwise and irregularly, and the lower valve is microscopically reticulated.

Distribution. Arctic Seas in the North Atlantic, from Smith Sound to Bergen and the Gulf of St. Lawrence, White Sea and coasts of Russian Lapland ; $5 \frac{1}{2}-1785 \mathrm{fms}$.

Fossil. $82^{\circ} 27^{\prime}$ N. lat., Norway, Scotland, and Maine ; from 30-40 ft . in depth to 200 ft . in height.

The shell is far from being "equivalve," as Sowerby described it. $P$. vitreus of Gray, but not Chemnitz's species of that name.

## 18. Pecten vitreus, Chemnitz.

Pallium vitreum, Chemn. Conch.-Cab. vii. p. 335, t. 67. f. 637 a.
Pecten vitreus, B. C. v. p. 168, pl. xcix. f. 6.
'Lightning' Exp.: St. 6, 7.
'Porcupine' Exp. 1869 : St. 3, 4, 5, 6, 13, 23, 23a, 47. 1870: Atl. 1, 2, 3, 6, 8, 9, Vigo B., 16, 17 a, off C. Espichel, 24, 26, 27, 28, $28 a, 21-34$. Some specimens from the same locality are more or less covered with tubercles or short scales on the concentric lines of growth; others are quite smooth and constitute the variety abyssorum. The microscopic strix which radiate from the beak are also sometimes nearly wanting in young specimens.

Distribution. Greenland, Iceland, Scandinavia, Shetland, S.W. France, coast of Portugal, Mediterranean, N.E. America, var. abyssorum 'Challenger' Exp. (W. Patagonia) ; 20-600 fms. Herr Friele dredged a specimen at Bergen attached to Primnoa, which measured an inch in length and breadth.

Fossil. Pliocene and Post-tertiary. Norway, Sicily.

1. Amussium fenestratum, Forbes.

Pecten fenestratus, Forb. Rep. Brit. Assoc. 1843, pp. 146, 192. $P$. philippii, Acton, Ricerche conchiliologiche, 1855, f. 1a.
P. actoni, r. Martens, Mal. Bl. 1857, p. 194, t. iii. f. 1-3.
'Porcupine' Exp. 1870: Atl. St. 24, 27, 28, 28a, 36; Med. Cartagena B., Adventure Bank, off Rinaldo's Chair. Var. cancellata. White and of thinner texture, with the concentric ridges less numerous than the longitudinal strix, which are equal in size; it is also destitute of the inside ribs. 'Porcupine' Exp. 1869, St. 37, from the great depth of 2435 fathoms; a living specimen. A remarkable monstrosity occurred in an upper valve from the Adventure Bank having the proper sculpture of the lower valve, viz. being concentrically and closely striated; and the upper valve of another specimen has partly its own decussated sculpture and partly that of the lower valve. The sculpture is very variable, and is more or less deficient as well on the outside as in the inside of both valves; and the ears of the lower valve are nearly equal in two specimens.

Distribution. Coast of Portugal, Mediterranean, and EEgean; $50-250 \mathrm{fms}$.

Fossil. Pliocene. Sicily and Rhodes.
P. incequisculptus, Tiberi. P. concentricus of Forbes is the lower valve of either this species or A. hoskynsi. In neither of these species is the shell "æquivalvis," as described by him ; nor did he notice the

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inside sculpture. P. alaskensis of Dall, from Port Etches in the North Pacific is allied to the present species; but it differs not only in its much greater size, but also in the external sculpture, and in the number of internal ribs, which are from 17 to 21 in $A$. fenestratum and from 31 to 35 in A. alaskense.

## 2. Amussium hoskynsi, Forbes.

Pecten hoskynsi, Forb. Rep. Brit. Assoc. 1843, p. 192; G. O. Sars, Moll. reg. arct. Norv. p. 20, t. 2. f. 1, 1 a-e.
'Porcupine' Exp. 1869: St. 23, 39, 65. 1870: Atl. 1, 2, 3, $24-30$; Med. 55 . In specimens from the last-named station (1456 fms.) the upper valre is smooth or nearly so, and the inside ribs are entirely or partly absent. The microscopic sculpture of the young is very beautiful.

Distribution. Novaya Zemblia, off Spitzbergen and Jan Mayen I., E. coast of Greenland, Norway, Sicily, Egean, and off the Azores; $30-650$ fms. Arctic specimens are very large, measuring fully three quarters of an inch.
Fossil. Pliocene and Post-tertiary. Norway, Calabria, and Sicily.
Syn. Pecten fimbriatus and $P$. antiquatus (upper and lower ralves), Philippi, and P.imbrifer, Lorén. The sculpture is variable, although the upper valve is usually more or less corered lengthwise with rows of pustules or frills, and the lower valve is closely striated in the line of growth. The full number of internal ribs is 17. $\boldsymbol{P}$. pustulosus of Verrill, from the coast of New England, is probably this species; but I have not been able to sce more than a single specimen, which was smooth inside.
3. Amussium lucidum, Jeffreys.

Pleuronectia lucida (Jeffr.), Wyville-Thomson, Depths of the Sea, p. 464, f. 78.
A. lucidum, Jeffr., in Ann. \& Mag. Nat. Hist. Nov. 1876, p. 425.
'Porcupine' Exp. 1869: St. 39, 41, 420. 1870: Atl. 3a, 16, 17, 17a.

Distribution. 'Valorous' Exp., 'Challenger' Exp. (west of Azores and Pernambuco), Gulf of Mexico; 150-1450 fms.

Var. striata. Upper valve marked by fine, close-set, and more or less distinct longitudinal strix ; 'Porcupine' Exp. 1870, Atl., St. 1 i $\alpha$; 'Challenger' Exp. (off Marion I.), 1375 fms. The number of inside ribs varies from 9 to 15 .

## A. Shell equilateral, completely closed. Limatula.

1. Lima sarsit, Lovén.

Limea sarsii, Lov. Ind. Moll. Scand. p. 32.
Lima sarsii, B. C. ii. p. 78 ; v. p. 169, pl. xxv.f. 1.
‘Lightning' Exp. : St. 2, 5.
'Porcupine' Exp. 1869 : St. 15, 23 a, 65. 1870 : Atl. 1, 2, 3, 6, 24, 26-30; Med. 55, Adventure Bank.

Distribution. Vadsoe to Shetland, and throughout the Mediterranean ; $80-300 \mathrm{fms}$.

Fossil. Pliocene. Sicily, Rhodes.
Probably the Lima (Limatula) crassa of Forbes; but his diagnosis was incomplete and unsatisfactory. He did not even notice the peculiar imbricated sculpture caused by the transverse or concentric strix. Lovén not only described his species accurately and with sufficient fulness to ensure identification, but he rightly assigned it to the genus (or rather subgenus) of Bronn, which he characterized by having the hinge-plate denticulated.

At Station 26 of the 'Porcupine' Expedition of 1870 occurred a minute oval valve ( 1 millimetre $=\frac{1}{25}$ of an inch long), which differs from a young $L$. sarsii of the same size in being more solid, and apparently adult. It is slightly ribbed lengthwise, instead of being imbricated or nodulous; the hinge is not shouldered; and the hinge-plate is rery broad and obtusely triangular, with a proportionally large cartilage-pit. It may be provisionally named L. subcostata.

## 2. Lima elliptica, Jeffreys.

Lima elliptica, B. C. ii. p. 81 ; v. p. 169, pl. xxv. f. 2.
'Lightning' Exp.: St. 2, 5.
'Porcupine' Exp., 1869: St. 3, 13, 61, the Minch. 1870: Atl. 3, off C. Sagres, 27, 28, $28 a, 36$, Tangier B.; Med. Rasel Amoush, Adventure Bank, off Rinaldo's Chair.

Distribution. Loffoden I. to the Archipelago, Adriatic, Newfoundland, and N. Japan ; 6-400 fms.

Fossil. Pliocene and Post-tertiary. Norway, Coralline Crag, Belgium, Hungary, Italy, Rhodes; 0-100 ft.

This may be partly the Ostrea nivea of Brocchi-not the fossil (which has no furrow), but the species noticed by him as recent, and measuring half an inch in length. His fossil and recent species of the same name were evidently different; aud the former only was described and figured. The $O$. nivea of Renier caninot be recognized ; his work is a mere catalogue of names. L. (Limatula) cuneata of Forbes is described as "auriculis inæqualibus." In the present species, as well as in the next, the ears are quite equal.

## 3. Lima subovata, Jeffreys. (Plate XLV.f. 2.)

Lima subovata, Jeffr.. in Ann. \& Mag. N. H. Nov. 1876, p. 427.
'Porcupine' Exp. 1869: St. 19, 20, 23, 23 a, 47 (var. angustior; smaller, oblong, and narrower). 1870: Med. 55.

Distribution. 'Valorous' Exp., 'Challenger' Exp. (off the Azores) ; Norwegian arctic Exp. 1878; Dutch arctic Exp., Sicily; 16-1450 fms. Arctic specimens are gigantic compared with those from Sicily, being about three quarters of an inch in length.
Fossil. Pliocene. Pal

Fossil. Pliocene. Palermo.

## 4. Lima subauriculata, Montagu.

Pecten subauriculata, Mont. Test. Brit. Suppl. p. 63, t. 29. f. 2.
Lima subauriculata, B. C. ii. p. 82; v. p. 169, pl. xxv. f. 3.
'Lightning' Exp.: St. 2, 5, 6, 7.
'Porcupine' Exp. 1869 : St. 14, 23 a, 62. 1870: Atl. 2, 9, off C. Sagres, 26-30, 36, Tangier B. ; Med. 55, off Rinaldo's Chair.

Distribution. Wellington Chamel, Davis Strait, Novaya Zeniblia, Iceland to Gibraltar, Mediterranean, Adriatic, Egean, Canary Isles, Labrador to Sable I., and W. coast of N. America; 10-1/785 fms.

Fossil. Pliocene and Post-tertiary. Norway, Coralline Crag, Belgium, Vienna Basin, Italy, and Rhodes ; 0-80 ft.

Synonyms. L. sulcata (Leach), Möller; L. elongata, Forbes; L. sulculus (Leach), Lovén; L. unicostata, Leach, and L. nivea (Renier), Philippi. Forbes has both L. subauriculata and L. elongata in his Report on Egean Invertebrata, giving 15-30 fms. as the range of depth for the former species, and $55-140 \mathrm{fms}$. for the latter.
B. Shell inequilateral, more or less gaping or open at the sides. Mantellum.
5. Lima loscombit, G. B. Sowerby.

Lima loscombii, Sow., Gen. Sh. (Lima), f. 4 : B. C. ii. p. 85, pl. ii. f. 2, $2 a$; v. p. 178, pl. xxv. f. 4.
' Porcupine’ Exp. 1869 : St. 6, Galway B., 68. 1870 : Atl. Vigo B., 31-34, Tangier B.; Med. 55, Benzert Road.

Distribution. Loffoden Isles to the Adriatic and Egean, Teneriffe ; $5-205 \mathrm{fms}$.

Fossil. Pliocene and Post-tertiary. Norway, Red and Coralline Crag, Belgium, Italy, Rhodes; 0-240 ft.
6. Lima hians, Gmelin.

Ostrea hians, Gmel., L. S. N. ed. xiii. p. 3332.
L. .itans, B. C. ii. p. 87 ; v. p. 170, pl. xxv. f. 5.
'Porcupine' Exp. 1870 : Atl. St. Vigo B., 36.
Distribution. Loffoden Isles to the Morea, Adristic, Mogador, Madeira, Canaries, and Azores ; $0-110$ fms.

Fossil. Pliocene and Post-tertiary. Coralline Crag, Scotland, Ireand, Vienna Basin, Sicily, and Rhodes.
7. Lima excavata, Fabricius.

Ostrea excavata, Fabr. in Schröter's Naturg. t. ii. p. 117.
Excavata fabricii, Chemn. Conch.-Cab. 1. 68. f. 654.
' Lightning' Exp., St. 5. A hinge ard part of the valves, quite fresh and united by the cartilage. Perhaps taken by a fish on the Norwegian coast, and carried out to sea.
'Porcupine' Exp. 1870: Atl. St. 22, 24, 25. Fragments of old and young specimens. Semifossil ?

Distribution. Scandinavia, from Finmark to Bohuslän. 'Chal-
lenger ${ }^{\text {' }}$ Exp. (W. Patagonia and off Japan) ; 10-775 fms. Herr Friele informs me that by sinking a dredge in Osterfiord, almost perpendicularly, to the depth of 350 fathoms, he has brought up this grand and beautiful species, with also living specimens of $\boldsymbol{M}_{y}$ tilus edulis and Littorina rudis, and that L. excavata attaches itself by a strong byssus to rocks close to the shore.

Fossil. Pliocene and Post-tertiary. Norway, Altavilla?, and Sicily.

Apparently $L$, solida of Calcara.

## Family-V. Aviculide.

Avicula hirundo, Linné.
Mytilus hirundo, L. S. N. p. 1159.
A. hirundo, B. C. ii. p. 95 ; v. p. 170, pl. xxv. f. 6.
'Porcupine' Exp. 1870 : Atl., St. 10, 13, off C. Sagres, 27, 28, $28 a, 36$, Tangier B. ; Med. off Jijeli, Rasel Aınoush.

Distribution. Southern coasts of England to the Adriatic and Egean, Madeira, Canaries, Azores ; 0-205 fms.

Fossil. Pliocene, Coralline Crag, S. Italy.
One of the two specimens still preserved in the Linnean collection of shells as "Mytilus hirundo,' is certainly the present species. In the 'Systema Nature' the first reference is to the 'Mus. Ulr. Reg.,' where the description agrees with the European species, although no habitat is given ; the second reference is to Lister's 'Hist. Conch.,' who cites D'Argenville for the vernacular name "Dattici," used by the Genoese. Lamarck called the species A. tarentina and A. atlantica, describing the former as "valvis æqualibus," and the latter (more appropriately) as "valvis inæqualibus."

Pinna rudis, Linné.
Pinna rudis, L. S. N. p. 1159 : B. C. ii. p. 99, pl. iii. f. 1, and frontispiece; $\nabla$. p. 170, pl. xxvi.
'Porcupine' Exp. 1870: Atl., St. 13, Vigo B., off C. Sagres, Gibraltar B., Tangier B. ; Med. 50, 50 a, Rasel Amoush.

Distribution. Great Britain and Ireland to the Adriatic and Morea, Madeira, Canaries, and Azores; 0-80 fms.

Fossil. Pliocene. Coralline Crag (fragments), Belgium, Italy, and Rhodes.

There is no end of synonyms. Poli, Payraudeau, Phiiippi, and many other conchologists of repute have adopted the Linnean name rudis. The shape and sculpture are extremely variable.

## Family VI. Mytilidis.

1. Mytilus edulis, Linné.
l Mytilus edulis, L.S.N. p. 1157 : B. C. ii. p. 104, pl. iii. f. 2 ; v. p. 171, pl. xxvii. f. 1.
'Porcupine' Exp. 1870: Atl. St. Vigo B. and Gibraltar B. Valves only.

Distribution. Circumpolar, and throughout the North Atlantic, Adriatic, Mediterranean to Smyrna, North Pacific to Mexico, Kerguelen Land, 'Challenger' Exp. (New Zealand and Falkland I.); usually littoral or tidal, but occasionally living below the laminarian zone.

Fossil. Pliocene and Post-tertiary. Greenland, Iceland, Scandinavia, Great Britain and Ireland, Belgium, S. France, Italy to Ustica I., Labrador and N.E. America southwards to Florida; 0-1360 ft.

This very common species has been called by nearly twenty names. It varies greatly in size, from the stunted form (incurvata) to the arctic variety (gigantea), specimens of the latter being nine or ten inches long.

## 2. Mytilus pictus, Boin.

, Mytilus pictus, Born, Test. Mus. Cæs. p. 111 (1778); p. 127, t. vii. f. 6, 7 (1780).
' Porcupine' Exp., 1870: Med. St. Capo de Gata, 51, Adventure Bank. Valves only.

Distribution. S. W. and S. France, S. Spain, Adriatic, Algiers, Malta, Morocco, W. and S. Africa, Canaries; $0-10 \mathrm{fms}$.
M. africanus of Chemnitz and M. afer of Gmelin.
3. Mytilus adriaticus, Lamarck.

Mytilus adriaticus, Lam. Av. s. Vert. vi. p. 112 : B. C. ii. p. 116 ; V. p. 171, pl. xxvii. f. 4.
' Porcupine' Exp. 1869: St. Loch Foyle. 1870: Atl. Vigo B., Tangier B.; Med. Benzert Road, Adventure Bark.

Distribution. Finmark to Malta and Egypt, Adriatic, Canaries ; 2-50 fms.

Fossil. Pliocene and Post-tertiary. Belfast, Italy. Many synonyms, but all now obsolete.
4. Mytilus incurvatus, Philippi.

Modiola incurvata, Phil. En. Moll. Sic. i. p. 72, t. 4. f. 20.
'Porcupine' Exp. 1870: Med. St. 50 a. A single living specimen. The byssus is very long.

Distribution. Benicarlo in Valencia; 15 fms .
Fossil. Pliocene. Sicily.
My specimen, which I have considered the same species as Philippi's fossil, undoubtedly belongs to the species lately described and figured as Modio7a martorelli by Dr. Hidalgo in his excellent work on the marine Mollusca of Spain, Portugal, and the Balearic Isles. Through the kindness of the Abbé Brugnone, I have now had an opportunity of carefully comparing his fossil specimen from Sicily with my recent specimen from the 'Porcupine' Expedition of 1870 ; and I can see no difference between them, except that the former has a more curved or arched contour. But this is evidently a variable character in the recent form, judging from my inspection at Paiermo of a specimen sent by Dr. Hidalgo to the Marquis de Mon-
terosato, in which some degree of curvature is observable. After I had written the above I reccived from Dr. Hidalgo (to whom my best thanks are due for this and other favours) a fine specimen of his M. martorelli, which is considerably incurved in front, with a corresponding arcuation at the back; and it exactly resembles Brugnone's fossil specimen.
5. Mytilus modiolus, Limé.

Mytilus modiolus, L.S. N. p. 1158 : B. C. ii. p. 111; v. p. 171, pl. xxvii. f. 2.
'Porcupine' Exp. 1870: Atl. Setubal B. A fragment, perhaps fossil.

Distribution. Iceland to the west coast of France, White Sea, Labrador to New York, Behring Strait to California and Japan, not Greenland nor Spitzbergen; $0-100 \mathrm{fms}$. Von Schrenck gives as synonyms Modiola philippinarum of Hanley and Modiola australis of Gray, the former from the Philippine Isles, and the latter from Australia. If these identifications are correct, they would imply a more extensive distribution.

Fossil. Pliocene and Post-tertiary. Scandinavia, Great Britain and Ireland, Belgium, Italy, Labrador to Nantucket I. ; 0-470 ft.
2 6. Mytilus barbatus, Linné.
Mytilus barbatus, L. S. N. p. 1156 : B. C. ii. p. 114; v. p. 171, pl. xxvii. f. 3.
'Porcupine' Exp. 1870 : Atl. St. Vigo B. ; Med. Benzert Road (valves).

Distribution. S. \& W. England, Wales, and Ireland, southwards to Malta and Alexandria, N. Japan and Gulf of Yedo; $0-95 \mathrm{fms}$. Fossil. Pliocene. Red Crag, and Italy.

## 7. Mytilus phaseolinus, Philippi.

$\checkmark$ Modiola phaseolina, Phil. Moll. Sic. p. 51, t. xv. f. 14.
Mytilus phaseolinus, B. C. ii. p. 118; v. p. 1/1, pl. xxvii. f. 5.
'Porcupine' Exp. 1869: St. 1, 2. 1870: Atl. Vigo B., 25, off C. Sagres, 26, 30, Tangier B. ; Med. Cartagena B., 50, 51, Rasel Amoush, off Rinaldo's Chair.

Distribution. Iceland and Finmark to the Egean and Adriatic ; $0-3000 \mathrm{fms}$.

Fossil. Pliocene and Post-tertiary. Norway, Coralline Crag, Belgium, Italy, and Rhodes; $0-100 \mathrm{ft}$.

Among other synonyms are probably Mrytilus barbatus of Müller and Fabricius, but not of Linné, and certainly Modiola pusio of Mörch, but not of Philippi.

I dredged a minute valve of Mytilus bidens, Linné, in the 'Porcupine' Espedition of 1870, at Station 17 a. A Foraminifer (Rhabdammina abyssorum, M. Sars) was attached to it. M. Zidens is a West-Indian species, and has been acclimatized at Barcelona.

1. Modiolaria marmorata, Forbes.

Mytilus marmoratus, Forb. Mal. Mon. p. 44.
Modiolaria marmorata, B. C. ii. p. 122, pl. iii. f. 3; v. p. 171, pl. xxviii. f. 1.
'Porcupine' Exp. 1869 : St. 9, the Minch. 1870 : Atl. Vigo B., Tangier B.; Med. Cartagena B., Capo de Gata, Adventure Bank.

Distribution. Bergen to Smyrna, Adriatic, Mogador, Gulf of Suez and Persian Gulf, Canaries, N. Pacific, perhaps S. Carolina as Crenella lateralis of Say; 10-150 fms.

Fossil. Pliocene and Post-tertiary. Coralline and Red Crag, Belfast, Belgium, Italy.

Cantraine's specific name subpicta has precedence of marmorata by three years; and that given by Say, lateralis (if applicable to the present species), is still older; but marmorata is now in general use.
2. Modiolaria discors, Linné.

Mytilus discors, L. S. N. p. 1159.
MIodiolaria discors, B. C. ii. p. 126; v. p. 171, pl. xxviii. f. 3.
' Lightning' Exp.: St. 1, 3.
Distribution. Arctic ocean in both hemispheres, 'Valorous' Exp., Iceland to Guernsey, west coast of France, Piedmont, Elgean, N.E. America from Labrador to Cape Cod, and N. Pacific southwards to Oregon and Japan; $0-1785 \mathrm{fms}$.

Fossil. Pliocene and Post-tertiary. Scandinavia, Great Britain, Vienna Basin?, N.E. America; $0-100 \mathrm{ft}$.

Modiola lavigata and substriata of Gray and Modiola lavis of Beck are varieties of the present species, and connected by intermediate gradations with the typical form.
$\checkmark$ 3. Modiolaria nigra, Gray.
Modiola nigra, Gray, Suppl. to App. to Parry's first voyage, p. cexliv.

Modiolaria nigra, B. C. ii. p. 128 ; v. p. 171, pl. xxviii. f. 4.
' Lightning' Exp. : St. off the Faroe Isles.
' Porcupine' Exp. 1869: St. off Lerwick.
Distribution. With M. discors as arctic, Iceland to the Dogger bank, Holland ?, N.E. and N.W. America, Novaya Zemblia, Sea of Okhotsk; 7-350 fms.

Fossil. Post-tertiary. Iceland, Norfolk?, Scotland, N.E. America.
This may have been the Mytilus striatulus of Linné's 'Mantissa,' as Beck supposed; but the term "unidentato" makes it doubtful. It is the Modiola nexa of Gould.
4. Modiolaria subclavata, Libassi.

Modiola subclavata, Lib. Mem. Conch. foss. in Atti Pan. iii. (1859), p. 13, f. 7.
'Porcupine' Exp. 1870: Atl. St. Vigo B., Tangier B. Valves only.

Distribution. Brittany, G. Gascony, N. Spain, Provence, Canaries; $12-50 \mathrm{fms}$.
Fossil. Pliocene. Siena, Palermo.
Modiola gibberula of Cailliaud, and Lithodomus semigranatus of Reeve. Differs from Modiolaria petagnce (with which it has been found) in size, shape, sculpture, aud the prolongation of the terminal beard-like epidermis.

Crenella decussata, Montagu.
Mytilus decussatus, Mont. Test. Brit. Suppl. p. 69.
Crenella decussata, B. C. ii. p. 133, pl. iii. f. 4 ; v. p. 172, pl. xxviii. f. 6 .
'Lightning' Exp. : St. 4, 5.
' Porcupine' Exp. 1870 : Med. Adventure Bank. Valves, smaller than North-Atlantic specimens.

Distribution. Spitzbergen to the coasts of Northumberland and co. Antrim, Novaya Zemblia, White Sea, and coasts of Russian Lapland, Davis Strait to New England, N. Pacific (Catalina I. and Corea) ; $0-1750 \mathrm{fms}$.

Fossil. Plioceue and Post-tertiary. Norway, Scotland, Sicily; $0-40 \mathrm{ft}$.

Dacrydium vitreum (Holböll), Möller.
Modiola? vitrea (Holböll), Möll. Ind. Moll. Grœnl. p. 19.
Dacrydium vitreum, Torell, Spitzb. Moll. p. 138, t. i. f. $2 a, b$.
'Porcupine' Exp. 1869 : St. 23, 23 a, 25, 37, 38, 65. 1870 : Atl. $16,17,17 a, 22,30$.
Distribution. Swedish arctic Exp. 1868, 'Valorous' Exp. 1875, Noraya Zemblia, Norwegisn arctic Exp. 1877 and 1878, 'Challenger" Exp. (between the Azores and Bermuda), Norway from Vadsoe to Christianiafiord, both sides of the Mediterranean, Gulf of St. Lawrence, New England; 30-2750 fms.

Fossil. Pliocene and Post-tertiary. Elie in Fifeshire, Cassel, Palermo.

Modiola pygmaa of Philippi and Dacrydium hyalinum of Monterosato. I cannot discover any difference except size to distinguish Mediterranean from North-Atlantic specimnns. As to the name and characteristics of the genus Dacrydium, I would refer to the 'Annals and Magazine of Natural History ' for November 1876, p. 429 .

This remarkable and pretty mollusk makes a nest (like Modiolaria discors and Lima hians) consisting of a narrow tubular case twice the length of the shell. The case is lined with a delicate membrane, and coated with minute Foramiuifera, fragments of sponge, and coccospheres, which are firmly agglutinated. The Dacrydium inhabits the broader and lower half of the case, its front or "ventral" margin lying in the direction of the narrower part or opening.

Idas argenteus, Jeffreys. (Plate XLV. fig. 3.)
Idas argenteus, Jeffr. in Ann. \& Mag. N. H. Nov. 1876, p. 428.
' Porcupine' Exp. 1870, Atl. St. 16.
Distribution. 'Valorous' Exp.; 1450 fms.

## Family VII. Arcide.

## 1. Arca barbata, Limué.

A. barbata, L. S. N. p. 1140: Poli, Test. utr. Sic. ii. p. 135, t. xxv.f. 6, 7 : B. C. ii. p. 183; v. p. 176.
'Porcupine' Exp. 1870 : Atl. St. Gibraltar B.
Distribution. Atlantic coasts of France from Quimper to Rochelle, Cadiz, Mogador, throughout the Mediterranean and Adriatic; 2-100 fms.

Fossil. Miocene and Pliocene. S.W. and S. France, Vienna Basin, Galicia, Transylvania, Volkynia, Italy, Morea, Cyprus and Rhodes, Madeira.
2. Arca lactea, Limé.
A. lactea, L. S. N. p. 1141 : B. C. ii. p. 177; v. p. 175, pl. xxx. f. 5.
' Porcupine' Exp. 1870: Atl. St. Vigo B., 36, Tangier B., Gibraltar B.; Med. 50, 55, Adrenture Bank.

Distribution. Berwick B. and Oban southwards to Mogador, and eastwards to the Morea, Adriatic, Red Sea, Senegal, Canaries; $0-150 \mathrm{fms}$.

Fossil. Miocene, Pliocene, and Post-tertiary. England and Ireland, S.W. and S. France, Podolia, Vienna Basin, Transylvania, Italy, Cyprus and Rhodes; 0-600 ft.

Several obsolete synonyms.
3. Arca nodulosa, Müller.
A. nodulosa, Müll. Zool. Dan. Prodr. p. 247: B. C. ii. p. 180; v. p. 176, pl.c.f. 2.
'Lightning' Exp.: St. 2, 4, 5.
'Porcupine' Exp. 1869: St. 13, 14, 51, 61, 65. 1870 : Atl. 3, 9, 16, 17 a, 24, 26-29 ; Med. 45, 55, 58, Adventure Bank.

Distribution. Loffoden Isles to the Egean, Adriatic, Josephine Bank, Canaries, G. Mexico ; 10-700 fms.

Fossil. Pliocene and Post-tertiary. Norway, S. France, Italy; $0-100 \mathrm{ft}$.

Having carefully examined and compared more than one hundred specimens from the North Atlantic and Mediterranean, I am convinced that A. scabra of Poli is merely a coloured variety of the present species. Some specimens are oval, others oblong ; the angle of the hinge-line on either side is of different degrees of acuteness or obtuseness; and the texture and sculpture are finer or coarser according to the uature of the locality and sea-bottom. Specimens from the Gulf of Mexico are undistinguishable from Norwegian. In
a fossil state it is the A. aspera of Philippi. I must admit, however, the great difficulty of deciding whether certain species ought to be united or separated. This cannot be attempted without sufficient materials and experience.
4. Arca tetragona, Poli.
A. tetragona, Poli, Test. utr. Sic. ii. p. 137, t. x.xv. f. 12, 13 :
B. C. ii. p. 180, pl. iv. f. 5, $5 a$; v. p. 176, pl. хxx. f. 6, $6 a$.
' Porcupine' Exp. 1870 : Atl. St. Vigo B., 26, Tangier B. ; Med. 55, Benzert Road, Rasel Amoush, Adventure Bank, off Rinaldo's Chair.

Distribution. Finmark to Mogador, the Adriatic, Mediterranean, Ægean, Madeira, Canaries, Azores, 'Challenger' Exp. (Fernando Noronhas) ; 0-450 fms.

Fossil. Pliocene and Post-tertiary. Norway, Great Britain and Ireland, Belgium, S. France, Italy, and Madeira,

Synonyms rather numerous, but none worth recording. A. tetragona was apparently the small Norwegian species noticed by Limé as resembling $A$.tortuosa, and to which Müller and Pennant gave the latter name.
5. Arca noes, Limué.
A. noa, L. S. N. p. 1140 (partly) ; Poli, Test. utr. Sic. t. xxiv. f. 1, 2.
' Porcupine' Exp. 1870 : Med. St. Benzert Road.
Distribution. Morbihan and Charente Inférieure, Cadiz, throughout the Mediterranean to Egypt, Adriatic, Red Sea, Teneriffe, N. Carolina to West Indies ; $0-100 \mathrm{fms}$.

Fossil. Miocene and Pliocene. Vienna Basin, S. France, Algiers, Italy, Morea, Rhodes, Cyprus, and the Azores.

Marketable and eaten at Spezzia, Venice, Naples, and Malta.

## 6. Arca antiquata, Linné.

A. antiquata, L. S. N. p. 1141 (partly) : Poli Test. utr. Sic.,
t. xxv. f. 14, 15̂.
' Porcupine' Exp. 1870: Atl. St. Setubal B., 22, C. Sagres, 26, 30, 36, Tangier B. ; Med. 10, 55, G. of Bona, Benzert Road, Rasel Amoush, Adrenture Bank.

Distribution. Mogador and throughout the Mediterranean from Gibraltar to the Sea of Marmora, Adriatic, Red Sea to Madeira, Canaries, New England from Cape Cod southwards; 20-100 fms.
Fossil. Miocene and Pliocene. N.W. Germany, Vienna Basin, S.W. and S. France, Barcelona, Malaga, Algiers, Italy, and Morea. This is assuredly the A. antiquata of Poli. Linné founded his species on the wretched and unsatisfactory figures of Bonanni and other antiquated conchologists. It is also in part the A. antiquata of Lamarck; his $A$. diluvii was described from an Eocene species, and is different. Mayer proposed polii for our shell; but Brugnone says that two species were included under that name. Judging from

Say's description of A. transversa and the figures lately given by Bimney and Tryon, as well as from specimens which Mr. Dall has kindly sent me, I am inclined to consider it either the same as the present species or at most a variety of it. In Weinkauff's collection of Algerian shells is a specimen three and a half inches long, with 32 ribs, the usual number being 28 . A monstrosity in the same collection was named by M. Crosse $A$. weinkaufi. There are several other synonyms.

## 7. Arca obliqua, Philippi.

$\checkmark$ A. obliqua, Phil. Moll. Sic. ii. p. 43, t. xv. f. 2 : B. C. ii. p. 175; v. p. 175, pl. xxx. f. 4.
'Lightning' Exp. : St. 5.
' Porcupine' Exp. 1869 : St. 14, 15, 25, 65. 1870: Atl. 2, 3, 24, 25, C. Sagres, 26-30, 36; Med. 45, 55, 58, Adventure Bank, off Rinaldo's Chair.
Distribution. Bergen and Shetland to the Ægean, Azores; 30600 fms .

Fossil. Pliocene. S. France, Calabria, and Sicily.
Having now reexamined a great number of recent and fossil specimens from various localities, I must separate this from the next species for the following reasons:-d. obliqua is not merely much smaller, but it is shorter (measured from the beak to the front margin), and more sharply angulated on the anterior side; the strie are nodulous; and the teeth are more numerous, and straight instead of being set obliquely on the anterior side, as in A. ylacialis. Both species are somewhat inequivalve. Some specimens of A. obliqua have the inside of the front margin regularly and closely denticulated.

## 8. Arca glacialis, Gray.

A. glacialis, Gray in Suppl. App. Parry's first voyage, p. cexliv; Torell, Spitzb. Moll. t. ii. f. 7, $a, b$.
'Porcupine' Exp. 1869 : St. 23 a, 89. Valves only, and perhaps semifossil relics of the last glacial epoch.

Distribution. Arctic seas in both northern hemispheres, Iceland, and G. of St. Lawrence ; 25-1622 fms.

Fossil. Post-tertiary. Scandinavia, Maine ; 0-240 ft.
Not A. glacialis of Mighels.
-9. Arca pectunculoïdes, Scacchi.
A. pectunculoides, Sc. Ann. Civ. due Sic. vii. p. 82 (1833): B. C. ii. p. 171; v. p. 175, pl. xxx. f. 3.
'Lightning' Exp. : St. 2, 5, 7.
' Porcupine' Exp. 1869: St. 1, 6, 14, 15, 17, 23, 25, 61, 62, 65, off Lerwick. 1870 : Atl. 1, 2, 3, 6, 8, 9, 12, 13, 14, Setubal B., 24 -34; Med. 45, Cartagena B., 55, Benzert Road, Adventure Bank, off Rinaldo's Chair.
Distribution. Davis Strait to G. of St. Lawrence and Halifax.
' Valorous' Exp., Spitzbergen, Loffoden Isles to G. of Egina, 'Challenger' Exp. (off Culebra I., Danish West Indies); $20-1170 \mathrm{fms}$. Fossil. Pliocene and Post-tertiary. Norway, Coralline Crag (not Belgian), S. France, Italy, Rhodes ; $0-100 \mathrm{ft}$.
Var. septentrionalis. Larger, more triangular and oblique, and finely striated lengthwise, but not reticulated.

This form resembles that of the next species.
'Lightning' ' Exp.: St. 135.
'Porcupine' Exp. 1869: St. 23 a. 1870: Atl. 16, 17, 17 a.
Distribution. 'Bulldog' Exp., Norwegian arctic Exp. 1876, 1877, and 1878, Dutch arctic Exp., Finmark; 146-656 fms. Fossil. Pliocene. Palermo and Messina, with the typical form. Risso described this species in 1826 as A. grenophia; but the name may be considered obsolete. It is also the $A$. ruridentata of Searles Wood.
10. Arca frielei, Jeffreys. (Plate XLV. figs. 4, 4 a.) A. frielei (Jeffr.), Friele in Mag. f. Naturvid. xxiii. h. 3, p. 2
(1877).
'Porcupine' Exp. 1869: St. 65.
Distribution. Norwegian arctic Exp., 1876-8; 459-1333 fms.
Named in honour of Herr Herman Friele of Bergen, who undertook with such ability the charge of the Mollusca in the last-mentioned expeditions. This and the preceding two species belong to the section or subgenus Cucullcea, in which the teeth are comparatively few and placed obliquely. A. frielei has been lately figured in the Jahrb. d. D. malak. Ges. Ht. ii. 1879, t. 4. f. 9 ; but the hinge is represented as toothless, and I therefore have it refigured.

Glomus nitens, Jeffreys. (Plate XLV. figs. 5, 5 a.)
G. nitens, Jeffir, in Ann. \& Mag. N. H. Nov. 1876, p. 433.
'Porcupine' Exp. 1869 : St. 16, $19 a, 20,21,22,30,31,39$.
Distribution. 'Valorous' Exp.; 1750 fms.
The genus Glomus is remarkable for its globular shape, its elongated and slanting cartilage, and the teeth being few and set obliquely.

## Silicula ${ }^{1}$, Jeffreys.

Shell oval or oblong, open at the anterior or longer end : cartilage internal, minute : teeth laminar, parallel with the hinge-line, and not at right angles to it or diagonal, as in other genera of the Arca family.
I at first thought of Phaseolus as an appropriate generic name; but as that is so well known in Botany, I have substituted Silicula for the Mollusk. The type, which I will now describe, somewhat resembles an Estheria in shape; but the valves of the carapace in the Crustacean are punctated, and there is no true hinge. The Abbé Brugnone and the Marchese di Monterosato have discovered in the Tertiary formation at Ficarazzi, near Palermo, a minute fossil species of Silicula, for which the name ovata is proposed.

[^45]Silicula fragilis ${ }^{1}$, Jeffreys. (Plate XLV. figs. 6, 6a.)
Body clear white; foot axe-shaped.
Shell ensiform or obliquely oblong, inequilateral, compressed, thin, glossy, nacreous, and semitransparent: sculpture extremely fine and numerous but irregular concentric striæ, which are only observable with a magnifying glass; there are also occasional lines of growth: colour white, under a pale brownish-yellow epidermis: margins nearly straight at the back on the anterior side, rounded at the other side, extended and wedge-shaped at the anterior side, the extremity of which is truncated, with a slight notec or indentation in the middle, gradually curved in front: beaks placed near the smaller end, at about one third the length of the back; they are small, rather prominent, and calyciform : lunule well defined, lance-head-shaped, and elongated: ligament none: cartilage and pit oblique: hinge-line long, nearly straight on the anterior side, and gently curved on the other side: hinge-plate rather narrow: teeth elongated, four on each side, somewhat like the lateral teeth in Tellina, but overlapping one another, and not continuous: they are of different lengths, those at each end being the shortest and strongest: inside polished and iridescent, microscopically fretted towards the front margin : scars inconspicuous. L. $0 \cdot 15$, B. $0 \cdot 3$.
'Porcupine' Exp. 1869: St. 16, 28.

## A. More or less angulated or pointed at the longer end.

## 1. Leda pernula, Müller.

Arca permula, Müll. in Beschäft. Berl. Ges. naturf. Fr. iv. p. 57 (1779).
L. pernula, B. C. ii. p. 158; v. p. 173 : G. O. Sars, Moll. reg. arct. Norv. t. v. f. $1 a-d$.
'Porcupine' Exp. 1869 : St. 4, Loch Torridon. 1870: Atl. 1, 2, 6, 9. One perfect specimen (but dead) and several valves of different sizes, all being more or less smooth or destitute of concentric strix.

Distribution. Arctic Ocean in the N. Atlantic southwards to the Cattegat on the east and Maine on the west, Noraya Zemblia, Behring Strait ; 5-210 fms.

Fossil. Post-tertiary or "glacial," N. lat. $82^{\circ}$, N.E. America, Archangel, Scandinavia, Great Britain and Ircland ; 0-1360 ft.

Being variable in shape and sculpture, this species has many synonyms.
$\checkmark$ 2. Leda minuta, Müller.
Arca minuta, Müll. Zool. Dan. Prodr. p. 247.
L. minuta, B. C. ii. p. 155, pl. iv. f. 2; v. p. 173, pl. xxix. f. 6.
'Porcupine' Exp. 1869: St. 1, 23a, 25, North Channel, the Minch, Little Minch, near Belfast. 1870: Atl. 2, 9 (valves only, and perhaps semifossil).

Distribution. Arctic seas in both hemispheres, to the Cattegat
${ }^{1}$ Brittle.
and Bay of Fundy in the N. Atlantic and to Japan in the N. Pacific ; 5-150 fms.

Fossil. Post-tertiary or "glacial." Scandinavia, Great Britain and Ireland, Labrador and Canada; 0-130 ft.

The most common synonym is $L$. caudata, Donovan.
3. Leda fragilis, Chemnitz.

Arca fragilis, Chem. Conch.-Cab. vii. p. 199, t. 55. f. 546.
'Porcupine' Exp. 1870 : Atl. St. 10, Vigo B., 13, Setubal B., off C. Espichel, 22, 27-30, 36, Tangier B.; Med. 45, Cartagena B., 50, 54, 55, Benzert Road, Rasel Amoush, Adventure Bank, off Rinaldo's Chair. Abundant in the Mediterranean cruize.

Some specimens are more closely striated than others.
Distribution. Atlantic coasts of France and Lusitania from Arcachon to C. Trafalgar, throughout the Mediterranean to the Ægean, Adriatic, G. of Florida; 20-185 fms.

Fossil. Miocene and Pliocene. Belgium, N.W. Germany, Vienna Basin, Transylvania, Switzerland, S.W. \& S. France, Italy, Greece, and Rhodes.

This species was unmistakably described and figured by Chemnitz; and his specific name frayilis was adopted by that painstaking naturalist Dillwyn, and since by Hörnes and Hidalgo, although the last considered it distinct from the Nucula commutata of Philippi, which is certainly the present species. Risso, Chiereghini, and Eichwald gave it other names.

## 4. Leda pella, Linné.

Arca pella, L. S. N. p. 1141.
A. interrupta, Poli, Test. utr. Sic. ii. t. 25. f. 4, 5.
' Porcupine' Exp. 1870: Med. St. 50, 55, G. of Bona, Benzert Road, G. of Tunis, Adventure Bank. Varies in the sculpture, like L. fragilis.

Distribution. Atlantic coasts of Spain and Portugal, throughout the Mediterranean to the Sea of Marmora, Adriatic, Japan; 4-100 fms.

Fossil. Miocene and Pliocene. Antwerp Crag, Poland, Viema Basin, Switzerland, S.W. France, Italy, Greece, Rhodes and Cyprus.

The principal synonyms are Arca interrupta of Poli and Nucula emarginata of Payraudeau.

## $\checkmark$ 5. Leda arctica, Gray.

Nucula arctica, Gray in Suppl. App. Parry's first royage, p. celi (1824).

Portlandia arctica, G. O. Sars, Moll. reg. arct. Norv. p. 37, t. 4. f. $7 a-h$.
L. arctica, B. C. ii. p. 158.

Porcupine' Exp. 1869: St. Loch Torridon. A fine and perfect specimen and two valves, all apparently subfossil.

Distribution. Circumpolar in the N. Atlantic and Pacific, Novaya Zemblia, Jenissei B., 'Valorous' Exp., Norwegian arctic Exp. 1878, Iceland, Finmark; 5-1333 fms.

Fossil. Post-tertiary or "glacial." Norway and Sweden, Scotland, N.E. America; $60 \mathrm{fms} .-70 \mathrm{ft}$.

Nucula glacialis, Leach; N. truncata, Brown; N. portlandica, Hitchcock; N. siliqua and N. sulcifera, Reeve.
6. Leda messanensis, Seguenza.
L. acuminata, Jeffr. in Ann. \& Mag. N. H. July 1870, p. 69: Seguenza, Nuculidi terziarie merid. d'Ital. (R. Acad. Linc. 1877, separate copy), p. 15 , t. iii. f. 15,15 a-e.
'Porcupine' Exp. 1869 : St. 3, 15, 16, 23, 42. 1870 : Atl. 1, 2, $3,3 a, 6,9$, Vigo B., 22, 24, off C. Sagres, 25-34, 36 ; Med. 55, Adventure Bank.

Distribution. 'Valorous' Exp., W. Norway, Mediterranean, ' Josephine' Exp. (Azores), 'Challenger' Exp. (between Azores and Bermuda) ; $100-1750$ fms.

Fossil. Pliocene. S. Italy.
Body clear white: mantie having its edges protruded and pouting; these are plain or slightly jagged, and not ciliated : tubes separate; the upper tube is cylindrical and long, and has two minute tubercles at the point, one above and the other below : foot extensile, and shaped like that of its congener.

The shell is variable in length, and is wholly or partly marked (especially in front) by close and regular concentric striæ.
After I had published the specific name acuminata, I found that it had been preoccupied for an Oolitic species, the Nucula acuminata of Von Buch, which is also a Leda. I have therefore substituted in the case of the present species Professor Seguenza's MS. name messanensis. Eichwald's L. acuminata is L. fragilis.
7. Leda pustulosa, Jeffreys.
L. pustulosa, Jeffr. in Amn. \& Mag. N. H. Nuv. 1876, p. 430 ; Seg. Nuc. terz. p. 17, t. iii. f. 17, $17 a-d$.
'Porcupine' Exp. 1869: St. 16, 19, 20, 21, 23, 23a, 28, 30, 31, 58. 1870: Atl. 2, 3a, 17a, 27, 30 .

Distribution. 'Valorous' Exp., 1450 fms .
Fossil. Pliocene. S. Italy.
8. Leda frigida, Torell.

Yoldia frigida, Tor. Spitzb. Moll. p. 148, t. i. f. 3.
'Porcupine' Exp. 1869: St. 9, 23a, 28, 31, 36. 1870 : Atl. 1, $2,3,3 a, 6,9,16,22,24,26-34$.

Distribution. Spitzbergen, 'Valorons' Exp., Novaya Zemblia, Norwegian arctic Exp. 1877 and 1878, Loffoden Isles to Shetland, Palermo, G. of St. Lawrence, N. Japan; 3-650 fms.

Fossil. Pliocene and Post-tertiary. English last arctic Exp. (N. lat. $82^{\circ} 33^{\prime}$ ), Norway, Reggio and Messina.

The teeth are much more numerous and finer than in L. pustulosa.

Yoldia nana of M. Sars.

## 9. Leda tenuis, Philippi.

Nucula tenuis, Phil. En. Moll. Sic. i. p. 65, t. v. f. 9.
L. руgmæа, B. C. ii. p. 154; v. p. 173, pl. xxix. f. 5.
' Lightning' Exp.: St. 2, 3, 5, 7.
${ }^{\prime}$ Porcupine' Exp., 1869 : St. 1, 8, 13, 14, 15, 17, 18, 23a, 35, 61, 62, Loch Torridon. 1870 : Atl. 1, 2, 3a, 9, 13, 22, 24, off C. Sagres, 26-34; Med. 45, Cartagena B., 55, Benzert Road, Adventure Bank, off Rinaldo's Chair.

Distribution. Scandinavia to the Ægean ; 10-650 fms.
Fossil. Pliocene and Post-tertiary. Siberia?, Scandinavia, Great Britain and Ireland, Belgium ?, Transylvania ?, Biot, Italy ; 0-240 ft.

This species was referred by Philippi in his second volume to the Nucula pygmea of Von Münster; but the description and figure of the latter species given by Goldfuss in his 'Petrefacta Germanix,' and specimens of the fossils kindly sent me by Dr. Wiechmann, have convinced me that they are different species. I have therefore adopted Philippi's original name tenuis. The well-known Nucula tenuis of Montagu belongs to another genus ; but Philippi did not distinguish the genus Leda, and therefore changed his name for that of Von Münster. According to Forbes, N. gibbosa of James Smith is a variety of the present species. L. tenuis does not appear to inhabit the Arctic seas, although L. lenticula of Möller, = Yoldia abyssicola, Torell, has been mistaken for it by some authors, which makes it difficult to verify all the localities mentioned by them.

## 10. Leda lenticula, Möller.

Nucula lenticula, Möll. Ind. Moll. Grœnl. p. 17.
Foldia abyssicola, Torell, Spitz. Moll. t. i. f. 4, a, b.
'Porcupine' Exp. 1869: St. 9, 23a, Loch Torridon (perfect but dead and perhaps semifossil, like L. arctica). 1870: Atl. 34, 27, 28, 30. Valves only.

Distribution. Wellington Channel, Daris Strait, Dutch arctic Esp., Novaya Zemblia, Norwegian arctic Exp. 18i8, Shetland (semifossil ?) ; 20-656 fms.

Fossil. Post-tertiary or " glacial." Norway, Clyde beds, Siberia, Labrador, Canada, Maine.

I agree with Professor G. O. Sars that this may be Möller's species; but the description is so short and indeterminate that it is almost equally applicable to $L$. tenuis. The late Professor M. Sars regarded it as a variety of the latter species, and as the Nucula gibbosa of James Smith. It is the Foldia abyssicola of Torell, but not of M. Sars.

The present species is gibbous; and the anterior end is much more marked and upturned than in L. tenuis.

## 11. Leda striolata, Brugnone.

Toldia striolata, Brugn. Misc. Mal. (pars secunda, 1877), p. 9, f. 9.
Y. abyssicola, Seg. Nuc. terz. d'It. (1877), t. v. f. 28, $28 a$.
'Lightning' Exp.: St. 3.
'Porcupine' Exp. 1869 : St. 39, 42, 47. 1870: Atl. 3a, 9, 16, 17, $17 a$, off C. Espichel, 22, 24, 31-34.

Distribution. Palermo; 114 fms .
Fossil. Pliocene. Calabria and Sicily.
Differs from the last species ( $L$. lenticula) in being flatter, more sharply pointed or wedge-shaped at the anterior end, and concentrically striated; the striæ are regular and sometimes numerous, but usually distant and covering the front only. The epidermis in living specimens is yellowish-green. Striolata is not a classical word; and I had prorisionally named this species acutalis, but of course give way to the previous publication. Monterosato gave it the MS. name of producta.
12. Leda intermedia, M. Sars.

Portlundia intermedia, (M. Sars), G. O. Sars, Moll. reg. arct. Norv. p. 38, t. 4. f. $9, a-b$.
'Porcupine' Exp. 1870: Atl.St.16. A few valves, mostly imperfect.
Distribution. Greenland, Spitzbergen, 'Fox' Exp., Novaya Zemblia, Norwegian arctic Exp. 1878, Dutch arctic Exp., Finmark ; 25-1333 fms.

Not a North-Pacific species which I received from Mr. Dall as the Yoldia intermedia of Sars on the authority of the late Dr. Philip Carpenter.

## 13. Leda lucida, Lovéa.

Yoldia lucida, Lov. Ind. Moll. Scand. p. 34.
L. lucida, B. C. ii. p. 155 ; v. p. 173, pl. c. f. 1.
'Lightning' Exp.: St. 1, 2, 3, 5.
'Porcupine' Exp. 1869: St. 9, 13, 14, 15, 16, 19, 22, 28, 62. 1870: Atl. 1, 2, 3, 3a, 9, 13, 16, 17, 17a (var. declivis; anterior end more sloping and not so much upturned nor pointed), 176 (var. truncata; anterior end abruptly cut off); Med. 55.

Distribution. Swedish arctic Exp. 1868, 'Valorous' Exp., Novaya Zemblia, Norwegian arctic Exp. 1878, Finmark to Bohuslän, Palermo, G. St. Lawrence to Massachusetts B.; $10-730$ fms.

Fossil. Post-tertiary or "glacial." Norway, and Clyde beds. According to his description and figure, Seguenza's Yoldia lucida is a variety of $L$. pellucida. The latter species differs from $L$. lucida in being wedge-shaped and terminating in a point on the anterior side; L. lucida is in that part more or less upturned and squarish. The present species is $L$. obesa of Stimpson.

[^46]C. Espichel, 22. This form appears to be the varicty salicensis of Seguenza. Another variety, which I would call semistriata, is smoother, thimer, more glossy, and is partially striated either at the anterior end only or towards the front margin. It occurred in the 'Lightning' Expedition, Station 6, and in the 'Porcupine' Atlantic Expedition of 1870 at the following Stations, 2, 3, 6, 8, 9, 17, 24, 26-28a, 30-54. Young specimens of both varieties are nearly oval.

Distribution. 'Valorous’ Exp. (var. salicensis), 'Josephine’ Exp. (off the Azores ; var. semistriata) ; 550-1750 fms.

Fossil. Pliocene. Vienna Basin, Italy from Leghorn to Messina. Var. semistriata, Messina.

## B. Rounded at both ends.

V 15. Leda sericea, Jeffreys. (Plate XLVI. fig. 1.)
L. sericea, Jeffr. in Ann. and Mag. N. H. Nov. 1876, p. 432.
'Porcupine' Exp. 1869 : St. 19, 21, 30. 1870: Atl. 1 (var. ovata, longer in proportion to the breadth, but having the characteristic sculpture of the species), 16, 17, $17 a$.

Distribution. 'Valorous' Exp. ; 1450 fms.
v 16. Leda Jeffreysi, Hidalgo. (Plate XLVI. fig. 2.)
L. lata, Jeffr. in Ann. and Mag. N. H. Nov. 1876, p. 431.
'Porcupine' Exp. 1869: St. 9, 20, 30, 31. 1870: Atl. 16, 17, 17a.

Distribution. 'Valorous' Exp., 'Challenger' Exp. (between the Azores and Bermuda) ; 690-1785 fms.

Dr. Hidalgo, in his work above mentioned, has pointed out that the specific name lata (which I gave this shell) had been preoccupied by Mr. Hinds in the 'Zoology of the Voyage of H.M.S. Sulphur' (1845) for a New-Guiuea species, and that, although named there Nucula lata, it belonged to the genus Leda. He accordingly proposed to cancel the name lata and call the present species by my own name, a compliment for which I am grateful.

## 17. Leda subfquilatera ', Jeffreys. (Plate XLVI. fig. 3.)

Shecl transversely oblong-oval, nearly equilateral, somewhat depressed, rather thin, glossy, semitransparent: sculpture none except a few irregular periodical lines of growth : colour whitish : epidernis yellowish-white: margins obtuse-angled and pinched up at the back, equally rounded at each end, slightly produced or extended on the auterior side, gently curved in front: beaks almost central, prominent, rather gibbous, and incurved: lunule wanting, in consequence of the pouting and sharp margin at the back: cartilage and pit very minute, the latter sunken: hinge-line obtuse-angled: hinge-plate rather narrow, but strong: teeth small, erect and comblike, 8 on each side, besides 4 or 5 minute tubercles near the beak :

[^47]inside smooth and polished; edge sharp and plain : scars indistinct. L. $0 \cdot 225$, B. $0 \cdot 35$.
'Lightning' Exp. : St. 3.
'Porcupine' Exp. 1869: St. 23, 23a, 65. 1870: Atl. 3, 9, 17, $17 a$.

Distribution. Norwegian arctic Exp. 1878; 459-778 fms.
Differs from $L$. jeffreysi in its somewhat greater size, being at all ages much broader in proportion to the length (and consequently more extended on each side), the anterior end not being upturned, and in the hinder margin being sharp-edged and pinched up.
18. Leda micrometrica, Seguenza.
L. micrometrica, Seg. Nuc. terz. mer. d'It. p. 21, t. iv. f. 22, $22 a-c$.
'Porcupine' Exp. 1869 : St. 23a. 1870, Med. 55. Valves only. Distribution. Sciacca, Sicily.
Fossil. Pliocene. Trapani near Messina.
I had previously given to this minute but distinct species the name oblonga, by which Monterosato called it.
19. Leda expansa, Jeffreys. (Plate XLVI. fig. 4.)
L. expansa, Jeffr. in Ann. and Mag. N. H. Nov. 1876, p. 431.
'Porcupine' Exp. 1869: St. 16, 30.
Distribution. 'Valorous' Exp.; 690-1750 fms.
20. Leda insculpta ${ }^{1}$, Jeffreys. (Plate XLVI. fig. 5.)

Shell transversely oval, equilateral, rather convex, moderately solid, semitransparent, and glossy: sculpture, numerous and regular but minute and fine concentric impressed striæ, which become stronger towards the front and are wanting at the back : colour white: epidermis pale yellowish: margins sinuous at the back owing to the prominence of the beaks, equally rounded on both sides, and curved in front: beaks central, prominent: cartilage and pit minute, the latter sunken: hinge-line forming a very obtuse angle: hinge-plate rather broad: teeth small, sharp and comb-like, deflected outwards, 8-10 on each side of the beak; they are placed on the inner side of the hinge-plate : inside lustrous, microscopically fretted, plain-edged: pallial and muscular scars rather distinct, the former being broad. L. $0 \cdot 075$. B. $0 \cdot 115$.
'Porcupine' Exp. 1869: St. 16. 1870 : Atl. 16, 17, 17 a.
Differs from L. expansa in shape, convexity, and sculpture.

## 21. Leda pusilla ${ }^{2}$, Jeffreys. (Plate XLVI. fig. 6.)

Shell roundish-oval, equilateral, somewhat compressed, remarkably solid for its size, opaque and glossy: sculpture, numerous and close-set concentric and very fine microscopic strix, which cover the whole shell: colour whitish : margins rounded on every side, except at the back so far as the continuity is interrupted by the beaks, con-

[^48]tracted in front: beaks central, but not prominent: cartilage and pit very small, somewhat elongated transversely : hinge-plate rather broad and strong: teeth minute and short, tubercular, 6-8 on each side: inside polished, plain-edged: scars indistinct. L. 0.0275. B. $0 \cdot 0375$.
'Porcupine' Exp. 1870 : Atl. St. 2, 3, 3a, 8, 9, Vigo B., 17 a, 24. Distribution. Palermo and Sciacca; $113 \frac{1}{2} \mathrm{fms}$.
Originally named by me microscopica; but that word is too much like micrometrica, which has been since used by Seguenza for another species above mentioned.
$\checkmark$ 22. Leda minima, Seguenza.
Foldia minima, Seg. Nuc. terz. merid. d'It. p. 18, t. v. f. 27, $27 a-c$.
'Porcupine' Exp. 1870: Atl. St. 3, 13, 17, 17a, 24 ; Med. 55.
Fossil. Pliocene. Province of Messina.
The specific name is inappropriate, because this species is not the smallest of the genus Leda. I had provisionally named it subrotunda; and Monterosato published that name, treating Seguenza's as a synonym.

## A. Edge plain or smooth.

$\checkmark$ 1. Nucula tenuis, Montagu.
Arca tenuis, Mont. Test. Brit. Suppl. p. 56, t. xxix. f. 1.
N. teкuis B. C. ii. p. 151 ; v. p. 172, pl. xxix. f. 4.
${ }^{\prime}$ Lightning' Exp.: St. 3, 5, 7.
${ }^{\prime}$ Porcupine' Exp. 1869: St. 1, 6, 9, Galway B., 13, 17. 1870 : Atl. 1, 2, 3, 9, Vigo B., 13, 16, 24, off C. Sagres.

Distribution. Circumpolar in the North Atlantic and Pacific, 'Valorous' Exp., Iceland to the N.W. coast of France, Mediterranean (Nares)!, Maine northwards, Kamptchatka Sea, Vancouver I., N. Japan ; 3-365 fms.

Fossil. Pliocene and Post-tertiary. Scandinavia, Great Britain and Ireland, Calabria aud Messina, Canada and Maine ; $0-12 \mathrm{ft}$.

The arctic form is $N$. inflata of Hancock, N. antiqua, Mighels, $N$. expansa, Reeve, and perhaps $N$. bellotii of A. Adams. In a fossil state the typical form is $N$. decipiens of Philippi.
$\checkmark$ 2. Nucula egeensis, Forbes.
N. ægeensis, Forb. Rep. Brit. Assoc. 1843, p. 192 : Hanley, Nuculidæ, p. 56 , pl. v. f. 154.
'Porcupine' Exp. 1870: Atl. St. 17a, 26-34, 36; Med. off Jijeli, 51, 55, Benzert Road, Adventure Bank, off Rinaldo's Chair, 58.

Distribution. Mediterranean eastward to the Egean, Adriatic; 60-250 fms.

Fossil. Pliocene. Ficarazzi near Palermo.
Assuming this to be Forbes's species (although his description is too scanty to be satisfactory), it may be distinguished from $N$. tenuis
by its usually smaller size, thinner texture, having a rounder and less oblique outline, and being more uniformly convex ; the posterior side is more abruptly angular; the beaks are more gibbous, and straight instead of inclining to one side; the hinge-line is broader, and teeth fewer; and the cartilage and pit are shorter and smaller, and not placed so obliquely as in $N$. tenuis.
N. macandrai of Hanley. The young was named by me $N$. convexa; and the fry appears to be the N. perminima of Monterosato.

1. 3. Nucula corbuloides, Seguenza.
N. corbuloides, Seg. Nuc. terz. merid. d'It. p. 9, t. i. f. 3, $3 a-k$.
'Porcupine' Exp. 1869 : St. 5, 6, 23, 40, 41. 1870: Atl. 3, 16, 17, $17 a$.

Fossil. Pliocene. Calabria and Messina district.
This somewhat resembles the young of $N$. ageensis, but is more triangular and gibbous, besides being closely and regularly striated in the line of growth. I had provisionally named it N. gibba.
4. Nucula delphinodonta, Mighels.
N. delphinodonta, Migh. and Adams, in Proc. Boston Soc. Nat. Hist. i. p. 48 (1841) ; ii. p. 324, pl. iv. f. 5 (1842).
'Lightning' Exp.: St. 3.
'Porcupine' Exp. 1869: St. 65.
Distribution. Davis Strait, 'Valorous' Exp., Norwegian arctic Exp. 18\%8, Norway from Vadsoe to Christianiafiord, N.E. America from G. St. Lawrence to B. of Fundy ; 25-410 fins.

Fossil. Pliocene. Sicily.
$N$. corticata of Möller. The fry are oval.

## B. Edge crenated.

5. Nucula tumidula, Malm,
N. tumidula, Malm in Scand. Naturf. Förh. viii. (1860), p. 621 : Göt. K. Vet. Vitt. Samh. Handl. Ny tidsf. viii. (1863), p. 122, pl. 2. f. 3.
'Porcupine' Exp. $1869:$ St. 36, 39, 47. 1870 : Atl. 3a, 6, 9, Vigo B., $16,17,22$, Med. 55. A valve from the last station, at the depth of 1456 fathoms, is permeated by the same peculiar organism which I noticed in my papers on Mollusca from the 'Valorous' Expedition. What is it?
Distribution. From Finmark to Bohuslän, Palermo, 'Challenger' Exp. (off Pernambuco) ; 20-650 fins.

Fossil. Pliocene. Calabria and Sicily.
It is the $N$. pumila of Lovén MS., according to Asbjörnsen $=N$. mucleus $\beta$ in Ind. Moll. Scand. Not my var. tumidula of $N$. nucleus, erroneously referred by me to the present species, which I then knew only by a short description, not having seen Malm's figure or a specimen. The young in a fossil state has been lately described and
figured by Seguenza as $N$. umbonata. This species differs from N. proxima, Say, in shape and sculpture, and is much smaller and less solid.

- 6. Nucula reticulata, Jeffreys. (Plate XLVI. fig. 7.)
N. reticulata, Jeffr. in Ann. and Mag. N. H. Nov. 1876, p. 429.
'Porcupine' Exp. 1869: St. 16, 19, 20, 21, 23a, 28, 30.
Distribution. 'Valorous' Exp., 'Challenger' Exp. (off San Miguel, Azores) ; 1000-1100 fms.
$N$. veticulata of Hanley (from the Philippines) is a species of Leda.

7. Nucula striatissima, Seguenza.
N. striatissima, Seg. Nuc. terz. merid. d'It. p. 6, t. i. f. la-c.
'Porcupine' Exp. 1870 : Atl. St. 17. A single but perfect specimen.

Fossil. Pliocene. Messina district.
This is more closely and finely striated than any other known species of Nucula. The N. trigona of Seguenza seems to be a variety, judging from the examination of a specimen which he kindly sent me for that purpose. I do not like the barbarous name striatissima ; but it is more characteristic than trigona, because all the species of the present genus are more or less triangular. Seguenza describes N.trigona as smooth (lavis); but his figure and specimen show that it is closely striated lengthwise.
8. Nucula sulcata, Bronn.
N. sulcata, Bronn, Italiens Tertiär-Gebilde, p. 109 (1831): B. C. ii. p. 141 ; v. p. 172, pl. xxix. f. 1, $1 a$.
'Porcupine' Exp. 1869 : St. 1, 6, 9, Galway B., 13, 17, 18, the Minch, Little Minch, Loch Torridon. 1870: Atl. 3a, 9, 10, 13, Setubal B., 22, 25, off C. Sagres, 26-30, 36 ; Med. 45, Capo de Gata, Cartagena B., 50, off Jijeli, Benzert Road, Rasel Amoush, Adventure Bank, off Rinaldo's Chair. The sculpture varies considerably in its comparative coarseness or fineness.

Distribution. Norway to the Agean and Sea of Marmora, and the Adriatic ; $5-190$ fms.

Fossil. Miocene, Pliocene, and Post-tertiary. Bohuslän, Caithness, N.W. Germany, Biot, Italy, and Rhodes.
N. polii, Philippi, and other obsolete synonyms. Not N. sulcuta, A. Adams, from New Zealand.

## 9. Nucula nucleus, Linné.

Arca nucleus, L. S. N. p. 1143.
N. nucleus, B. C. ii. p. 143, pl. iv. f. 1; v. p. 172, pl. xxir. f. 2.
'Lightning' Exp.: St. 4.
'Porcupine' Exp. 1869: St. 1, 2, 6, 9, 14, 18, near Belfast. 1870: Med. Capo de Gata, Rasel Amoush.

Distribution. Norway to Mogador, and through the Mediterranean eastward to the coast of Egypt, and the Adriatic ; 2-145 fms.

Fossil. Miocene, Pliocene, and Post-tertiary. Everywhere throughout Europe, Asia Minor, and Algeria; 0-350 ft.

Glycymeris argentea of Da Costa, Arca margaritacea of Bruguière, and other useless synonyms.
10. Nucula nitida, G. B. Sowerby.
N. nitida, Sow. Conch. Ill. (Nucula) p. 5, f. 20 : B. C.ii. p. 149; v. p. 172, pl. xxix. f. 3, $3 a$.
'Porcupine' Exp. 1869 : St. 2, 9, 18, 19. 1870: Atl. 3, Vigo B.; Med. 50, $50 a$ (var. veztros $a$; swollen and smooth), 51, 55, G. Bona, Benzert Road, Tunis B., Adventure Bank.

Distribution. Scandinavia to Smyrna; 0-120 fms.
Fossil. Pliocene and Post-tertiary. Coralline Crag, Paisley, Italy.
Not N. nitida of Bronn, which is Arca (Leda) nitida of Brocchi. A streaked variety of the present species is analogous to the variety radiata of $N$. nucleus.

1. Pectunculus glycymeris, Linné.

Arca glycymeris, L. S. N. p. 1143.
P. glycymeris, B. C. ii. p. 166, pl. iv. f. 4; v. p. 175, pl. xxx. f. 2.
'Lightning' Exp.: St. 5.
'Porcupine' Exp. 1869: St. the Minch. 1870: Atl. Vigo B., Setubal B., 26, 36. Tangier B. ; Med. Adventure Bank.

Distribution. Finmark and the Faroe Islands to Mogador, throughout the Mediterranean to Jaffa, Adriatic, Senegal, Madeira, Canaries, N. Japan ; 0-120 fms.

Fossil. Pliocene and Post-tertiary, Great Britain and Ireland, Belgium, S. France, Italy, Rhodes.

It is difficult to verify the recorded localities for this species and $\boldsymbol{P}$. pilosus, which have been evidently confounded by many authors.
P. pilosus is a larger, thicker, and more orbicular or globose shell; the longitudinal striæ are more conspicuous and distinct ; the hingearea is wider, and the teeth are fewer and larger. The synonyms of each are numerous, but have been intermixed.

## 2. Pectunculus nummarius, Linné.

Arca nummaria, L. S, N. p. 1143.
A. insubrica, Brocchi, Conch. foss. subapp. ii. p. 492, t. xi. f. 10.
'Porcupine' Exp. 1870: Med. St. Algesiras B., 50, Adventure Bank.

Distribution. S.W. France, Mediterranean eastwards to the coast of Egypt, Adriatic, Madeira and Canaries; 6-120 fms.

Fossil. Pliocene. Coralline Crag, S. France, Italy, Morea, Rhodes, and Cyprus.

Although Linnés description was taken from a young specimen, there can be no doubt as to the species, and his name ought to be retained. It is the $P$. violacescens of Lamarck, and has many other synonyms. Poli's figure (1 in plate xxvi.), without name or reference
excellently represents this species; and so does Payraudeau's figure (pl. ii. f. 1) of P. violacescens.

## A. Inside edge plain or smooth.

V1. Limopsis aurita, Brocchi.
Arca aurita, Bre. Conch. foss. subapp. ii. p. 485, t. xi. f. 9.
L. aurita, B. C. ii. p. 161, pl. iv. f. 3 ; v. p. 174, pl. xxx. f. 1.
' Lightning' Exp.: St. 2, 5, 7.
' Porcupine' Exp. 1869 : St. 3, 13, 14, 23a, 25, 45, 65. 1870 : Atl. 1, 2, 3, 3a, 6, 8, 9, Vigo B., 13, 24, C. Sagres, 26-30, 36, Tangier B. ; Med. Adventure Bank.

Distribution. Shetland, off W. coast of Ireland, 'Josephine' Exp. (Josephine Bank, off Gibraltar), Palermo, 'Valorous' Exp., Wellington Channel, 'Challenger' Exp. (off the Azores, Bermuda, and Colabra I.), Japan ; 21-1100 fms.

Fossit. Miocene and Pliocene. Denmark, Coralline and Red Crag, Holland, Antwerp, N.W. Germany, S. France, throughout Italy, and near Melbourne.
L. obliqua and L. cumingii of A. Adams. Some of his other species require further examination. The shell of L. aurita becomes oblique in the course of growth. In a fossil state it is the $L$. (Trigonoccelia) lavigata of Nyst.

## B. Inside edge crenated.

e' 2. Limopsis cristata, Jeffreys. (Plate XLVI. fig. 8.)
L. cristata, Jeffr. in Ann. \& Mag. N. H. Nov. 1876, p. 434.
'Lightring ' Exp. St. 5.
'Porcupine' Exp. 1869 : St. 2, 23, 23a, 36, 40, 47. 1870: Att. 2, 9, 17, off C. Espichel, 22, 24.

Pistribution. 'Valorous' Exp.; 690 fms.
A young specimen of L. minuta is figured (Pl. XLVI. f. 9) for comparison with L. cristata.
$\sqrt{3 .}$ Limopsis minuta, Philippi. (Plate XLVI. fig. 9.)
Pectunculus minutus, Ph. En. Moll. Sic. i. p. 63, t. v. f. 3, 3a, b; ii. p. 45 .
L. borealis, B. C. ii. p. 164 ; v. p. 174, pl. c. f. 3.
'Porcupine' Exp. $1869:$ St. 2, 3, 15, 23, 23a, 36, 45, 65. 1870 : Atl. 1, 2, 3, 3a, 6, 9, Vigo B., 13, 17 a, 24-34. Var. anyusta, St. 25. Smaller, narrower, thinner, and more oblique, slantingly truncated or contracted at the upper part of the posterior side, hingeline shorter, and having a pinkish-brown stain at the beaks and inside near the back. Some specimens of the typical form are finely and closely reticulated ; and in others the concentric ridges are crenated. See Ann. and Mag. (supra cit.) for further particulars as to this species.

Distribution. Throughout the North Atlantic in deep water from Finmark to Sicily, C. Good Hope, 'Josephine' Exp. (Azores), Nor-
wegian arctic Exp. 1878, 'Challenger' Exp. (off Fayal); 70-790 fms. Var. angusta, 'Challenger' Exp. (off 'Teneriffe); 70 fms.

Fossil. Miocene and Pliocene. Cassel, Mayence Basin, Italy.
Recent: L. borealis, Woodward, L. abyssicola, A. Adams, and the very young L. tenuis, Seguenza. Fossil: Pectunculus aradasii, Testa, P. grossi, Aradas, and L. incequidens, Sandberger.

1. Malletia obtusa, M. Sars.

Yoldia abyssicola, M. Sars in Christ. Vid. Selsk. Förh. (1858), p. 86.
Y. obtusa (M. Sars), G. O. Sars ' On some remarkable Forms of animal Life from the great Deeps off the Norwegian Coast ' (1872), p. 23, pl. 3. f. 16-20.
'Porcupine' Exp. 1869 : St. 19, 22, 28, 30. 1870: Atl. 9, off C. Espichel. The body is clear-white and gelatinous, and the upper tube is very long and cylindrical.

Distribution. Loffoden Isles to the Bergen coast, Norwegian arctic Exp. 1876 (between Norway and Iceland); 200-650 fms.

The MS. name abyssicola, originally given by the late eminent Professor Sars to this remarkable shell, was afterwards changed by him to obtusa in consequence of Torell having described and figured another shell which Sars regarded as also belonging to Yoldia, under the same name abyssicola. The present species is not the Yoldia obtusa of Gould (1846), from Hong-Kong harbour ; but that shell belongs to the genus Ledu; and at all events it is better to avoid further confusion by appropriating the uame obtusa to the NorthAtlantic shell. For the reasons which I gave in 'British Conchology' (ii. 153), I cannot recognize the genus Yoldia.

The late Dr. Mörch placed this species in the genus Malletia of Desmoulins, from an examination of my specimens. A tribute of respect to his memory is justly due from all conchologists for his bibliographical research, and other valuable labours.

## 2. Malletia cuneata, Jeffreys. (Plate XLVI. fig. 10.)

M. cuneata, Jeffr. in Ann. \& Mag. N. H. Nov. 1876, p. 435.
' Porcupine' Exp. 1869: St. 19, 20, 28. 1870: Atl.16, 17, 17a, off C. Espichel, 22 ; Med. 51.

Distribution. 'Valorous' Exp., Norwegian arctic Exp. 1876; 1333-1760 fms.
3. Malletia excisa, Philippi.

Nucula excisa, Ph. Moll. Sic. ii. p. 46, t. xv. f. 4.
M. excisa, Jeffr. in Ann. \& Mag. N. H. Nov. 1876, p. 435.
'Porcupine' Exp. 1869: St. 20, 21, 28.
Distribution. 'Valorous' Exp., 'Challenger' Exp. (W. of Azores and Canaries) ; 1125-1785 fms.

Fossil. Pliocene. Biot, Calabria, and Sicily.
It will be seen that the last species, as well as many other deepwater shells which have been noticed in the present paper, are Calabrian and Sicilian Tertiary fossils. Besides these species, others of the
same kind, and which had been also considered extinct (viz. Leda or Tindaria solida, Seg., Nucula glabra, Ph., and Malletia dilatata, Ph.), occurred in the 'Challenger' Expedition. The communication between the North Atlantic and the Mediterranean must have been formerly very different from what it is now, when a barrier or ridge in comparatively shallow water exists outside the Strait of Gibraltar, between Capes Spartel and Trafalgar. It is improbable that deep-sea Mollusca, even in their embryonic state, could have migrated or been transported under such conditions from one sea to another. The south of France and Italy must have experienced a great elsvation, and perhaps a succession of them, since the Pliocene period. For instance, the average depth at which Malletia excisa has been now found living is $1507 \frac{1}{3}$ fathoms, or 9044 feet, being very nearly five-sixths of the height of Mount Etna above the present level of the sea; and to this submarine elevation must be added the height of the Pliocene beds above the sea-level. Professor Seguenza informs me that M. excisa occurs in Sicily, as well as in Calabria, at a height of 600 metres or nearly 2000 feet, and that these fossiliferous beds attain double that height in other parts of the same district; so that the total elevation may be estimated at from 11,000 to 12,000 feet. Mount Etna is 10,874 feet high.

I have to acknowledge my obligations to the Rev. R. Boog Watson for his kind assistance in examining and comparing some of the 'Challenger' shells above referred to.

Summary of the foregoing Mollusca.

| Families. | Genera. | No. of species. |
| :---: | :---: | :---: |
| I. ANOMIID® | Anomia .. | .. 2 |
| II. OSTREIDE. | Ostrea .. | ... 2 |
| III. SPONDYLIDE | Spondylus.. | .... 1 |
| IV. PECTINIDE | Pecten .. | . . 18 |
|  | Amussium | .. 3 |
|  | Lima .... | . 7 |
| V. AVICULIDæ. | Avicula.. | ... 1 |
|  | Pinna... | .... 1 |
| VI. MYTILIDE | Mytilus . | . 7 |
|  | Modiolaria | 4 |
|  | Crenella | 1 |
|  | Dacrydium | . 1 |
|  | Idas........ | ... 1 |
| VII. ARCIDE | Arca .. | . 10 |
|  | Glomus .. | ... 1 |
|  | Silicula . . | ... 1 |
|  | Leda ... | . 22 |
|  | Nucula .. | .... 10 |
|  | Pectunculus | .... 2 |
|  | Limopsis. | 3 |
|  | Malletia | . 3 |
|  | Total. . | . 101 |

I take this opportunity to make a few additions and corrections to Part I. of this series of papers (Brachiopoda), P.Z. S. 1878 :-

Page 401. Terebratula caput-serpentis, var. septentrionalis. Norwegian arctic Exp. 1877, Dutch arctic Exp. 1878; 210-300 fathoms!
P. 402. Terebratula trigona of Quensted is a species of Rhynchonella.
P. 408. Prof. G. O. Sars agrees with me that Terebratula septata and T. septigera are one and the same species.
P. 410. Argiope cuneata, G. Gascony (De Folin)!
P. 411. Platydia anomioüdes, G. Gascony (De Folin, as P. davidsoni)!
P. 412. Thecidea mediterranea, G. Gascony (De Folin)!
P. 415. Discina atlantica. 'Challenger' Exp., off the coast of N. Australia (Watson).

## EXPLANATION OF THE_PLATES. <br> Plate XLV.

Fig. 1. Pecten fragilis, p. 561.
2. Lima subovata, p. 563.
3. Idas argenters, p. 570.
4. Arca frielei, p. 573.
5. G'lomus nitens, p. 573.
6. Silicula fragilis, p. 574.

> Plate XLVI.

Fig. 1. Leda sericea, p. 579.
2. - jeffreysi, p. 579.
3. - subcquilatera, p. 579.
4. - expansa, p. 580.
5. —insculpta, p. 580.
6. -pusilla, p. 580.
7. Nucula reticulata, p. 583.
8. Limopsis cristata, p. 585.
9. minuta (for comparison), p. 585.
10. Malletia cuneata, p. 586.
2. On the Birds collected in Bolivia by Mr. C. Buckley. By P. L. Sclater, M.A., Ph.D., F.R.S., and Osbert Salvin, M.A., F.R.S.
[Received Jume 17, 1879]
The materials of our present communication are the collections made in Bolivia by Mr. Clarence Buckley, a well-known and enthusiastic collector of Lepidopterous insects. On his first expedition to this republic (in 1873-4), Mr. Buckley went principally in quest of Butterflies, and of Birds obtained only a certain number of Trochilidæ for Mr. Gould.

Before starting again for Bolivia in 1875, Mr. Buckley arranged with Messrs. Salvin and Godman to form a general series of birds for their joint collection.

The result of this agreement was the acquisition of two carefully prepared collections of about 700 skins in all, referable to about 500 species, out of which we have already described the principal novelties in two papers read before the Society in February and April $1876^{1}$. Having now gone through the whole series, we have felt unwilling to pass by the opportunity of adding something more to the general knowledge of the rich Bolivian avifauna, in which, of late years, so little has been done. We therefore propose to give, herewith, a complete list of the species obtained by Mr. Buckley, as represented by the specimens in the collection of Messrs. Salvin and Godman.
On both of Mr. Buckley's expeditions his head quarters were at La Paz , whence excursions were made into the valleys and ranges to the north and east of that city. On the second expedition the principal series of birds was obtained at Tilotilo, a group of ranchos situated on a spur of the Andes extending between the Rio de la Paz and the Rio Coroico, as explained in a former paper.

The new species discovered by Mr. Buckley during these two expeditions were 19 in number, namely:-

1. Catharus mentalis, Scl. et Salv. P. Z. S. 1876, p. 352.
2. Basileuterus euophrys, Scl. et Salv. P. Z. S. 1876, p. 352.
3. Diglossa glauca, Scl. et Salv. P. Z. S. 1876, p. 253.
4. Calliste punctulata, Scl. et Salv. P. Z. S. 1876, p. 353.
5.     - fulvicervix, Scl. et Salv. P. Z. S. 1876, p. 354.
6. -argyrophenges, Scl. et Salv. P. Z. S. 1876, p. 354.
7. Malacothraupis dentata, Scl. et Salv. P. Z. S. 1876, p. 353.
8. Chlorospingus calophrys, Scl. et Salr. P. Z. S. 1876, p. 354.
9. Buarremon melanops, Scl. et Salv. P. Z. S. 1876, p. 253.
10. Ochthodiata fuscorufus, Scl. et Salv. P. Z. S. 1876, p. 354.
11. Ochthece pulchella, Scl. et Salv. P. Z. S. 1876, p. 355.
12. Anaretes favirostris, Scl. et Salv. P. Z. S. 1876, p. 355.
13. Leptopogon tristis, Scl. et Salv. P.Z.S. 1876, p. 254.
14. Synallaxis rufipennis, Scl. et Salv. infrà, p. 620.
15. Lathria uropygialis, Scl. et Salv. P. Z. S. 1876, p. 355.
16. Thamnophilus subfasciatus, Scl. et Salv. P. Z. S. 1876, p. 357.
17. Grallaria erythrotis, Scl. et Salv. P. Z. S. 1876, p. 357.
18. Asturina saturata, Scl. et Salv. P.Z. S. 1876, p. 357.
19. Leptoptila megalura, Scl. et Salv. infrà, p. 640 .

In order to render the list of Bolivian species more complete, we have inserted references to all the species obtained in this country by d'Orbigny and other explorers which we have been able to identify satisfactorily. These are not numerous, our authorities on Bolivian ornithology being but few. We will give a short account of those known to us.
(1) Alcide d'Orbigny. This well-known naturalist was the first scientific explorer of Bolivia, during his great South-American journey, 1826-33. His collection of birds, the full series of which was placed in the Museum of Paris, was worked out by the late Baron F. de Lafresnaye and himself; and the results were published, first in the

[^49]form of a "Synopsis" in the 'Magasin de Zoologie' for 1837 and 1838, and subsequently in a more extended form in his great work entitled 'Voyage dans l'Amérique méridionale,' of which the "Birds" form the third part of the fourth volume. Unfortunately, the account of d'Orbigny's birds was never completed, the "Synopsis" only proceeding as far as the Accipitres, Passeres, and Picarix, and the 'Voyage' being not quite so nearly perfect. In the remaining classes of birds many of d'Orbigny's discoveries have been since published by subsequent authors.
(2) In 1845-47 Mr. Thomas Bridges, a well-known Corresponding Member of this Society, collected in Bolivia for the late Earl of Derby, and sent home a large number of birds, which are now in the Derby Museum at Liverpool. Other specimens of the same collector found their way, through Mr. Bridges's agent Mr. Hugh Cuming, into the British Museum and other collections; but the localities attached to these specimens are not always trustworthy, as the Bolivian collections were mixed up by Mr. Cuming with those previonsly sent home by Mr. Bridges from Chili and Mendoza. Two letters of Mr. Bridges will be found in the Society's 'Proceedings ' for 1846 and $1847^{1}$. Unfortunately no general account of Mr. Bridges's excellent collections was ever prepared or published.
(3) Mr. J. B. Pentland, who was for some years H.B.M. Consul in Bolivia, collected many birds and other objects of natural history, some of which are now in the British and French national collections ${ }^{2}$. These also have never been worked out.
(4) The Polish naturalist, M. Warszewiez, of Warsaw, explored the eastern slopes of Illimani and Sorata about 1852-53, and discosered some brilliant Humming-birds, which were described by Mr. Gould in the Society's 'Proceedings' for $1853^{3}$. M. Warszewiez collected other birds, which passed into other museums on the Continent, and of which scattered notices have appeared.
(5) The late Mr. David Forbes, the distinguished geologist, collected birds in Bolivia, some of which are now in Sclater's collection. He was the discoverer of the remarkable Grebe Centropelna micropterum ${ }^{4}$, upon the Lake of Titicaca.
(6) Lastly, Mr. Walter Davis, who accompanied Mr. Alexander Agassiz's exploring party to Lake Titicaca in 1875, obtained examples of six species of birds at Coroico, on the eastern slope of Illimani, as noticed in Mr. J. A. Allen's account of the birds obtained during this expedition ${ }^{5}$. Most of the other species noticed in this memoir, no doubt, occur in Bolivia as well as Peru, as Lake Titicaca

[^50]is half in one republic and half in the other ; but we have not thought it necessary to include them in the present list.

In the following list Mr. Buckley's localities are marked (B.), those of d'Orbigny ( $O_{0}$ ).

## Fam. Turdide.

1. Catharus mentalis, Scl. \& Salv. P. Z. S. 1876, p. 352.

Suapi (B.).
2. Catharus maculatus, Scl.

Tilotilo (B.).
3. Turdus crotopezus, Licht.

Rio Toro, Tilotilo (B.).
4. Turdus leucomelas, Vieil.

Turdus olivaceus, Lafr. \& d'Orb. Syn. Av. i. p. 17.
Turdus rufiventris ㅇ, d'Orb. Voy. p. 203.
Mapiri, Baganti, and Tilotilo (B.) ; Santa Cruz de la Sierra (O.).
The skins marked T. olivaceus in the Paris Museum, which d'Orbigny subsequently referred to the fermale of T. rufiventris, belong to this species.
5. Turdus gigas, Fraser.

Sorata, Tilotilo (B.).
Mr. Buckley's skins cannot be separated from T. gigantodes, Cab. (J. f. O. 1873, p. 315), which is only a southern form of T. gigas.
6. Turdus fuscatus, Lafr. \& d'Orb. Syn. Av. i. p. 16; d'Orb. Voy. p. 200, t. ix. f. 5.

La Paz, Enquisivi, Cochabamba, Mizqui, Valle Grande, Chuquisaca (O.).

There are two Bolivian examples of this Thrush collected by Bridges, and one brought from that country by Mr. D. Forbes, in Sclater's collection. They agree fairly with specimens from Mendoza (Mus. S.-G.), which, however, have usually a longer bill.
7. Turdus chiguanco, Lafr. \& d'Orb. Syn. Av. i. p. 16 ; d’Orb. Voy. Ois. p. 201, t. ix. f. 2.

Palca, Tacna ( $O$.) ; Tilotilo (B.).
Mr. Buckley's skin agrees with Mr. Whitely's specimens from Western Peru, whence d'Orbigny's types were procured.
8. Turdus serranus (Tsch.); Scl. \& Saly. P. Z. S. 1870, p. 783.

Tilotilo (B.).
To the range of this species Bolivia must now be added.
9. Mimus dorsalis (d'Orb. et Lafr.).

Orpheus dorsalis, d'Orb. \& Lafr. Syn. Av. i. p. 18; d’Orb. Voy. Ois. p. 211, t. xi. f. 2.

Cochabamba (O.).
In Sclater's collection, from Bolivia (Bridges).
10. Mimus triurus (d’Orb. et Lafr.).

Orpheus tricaudatus, d'Orb. \& Lafr. Syn. Av. i. p. 18.
Orpheus triurus, d'Orb. Voy. Ois. p. 208.
Mission de San Jose, Chiquitos (O.).

## Fam. Sylviidx.

11. Myiadestes ralloides (D'Orb.).

Muscipeta armillata, d'Orb. \& Lafr. Syn. Av. i. p. 48.
M. ralloides, d'Orb. Voy. Ois. p. 322 .

Myiadestes ralloides, Scl. \& Salv. Ex. Orn. pl. xxvii.
Chulumani, Prov. Yungas (O.) ; Guanai, Tilotilo (B.).
12. Polioptila dumicola (Vieill.).

Culicivora bivittata, d’Orb. \& Lafr. Syn. Av. i. p. 56.
Culicivora dumicola, d'Orb. Voy. Ois. p. 331.
Culicivora boliviana, Scl. P. Z. S. 1852, p. 34, pl. 47.
Chiquitos and Moxos (O.).
In Sclater's collection, from Bolivia (Bridges) : type of his $C$. boliviana.

Fam. Troglodytide.
13. Donacobius albovittatus, d'Orb. \& Lafr. Syn. Av. i. p. 19; d'Orb. Voy. Ois. p. 213.
D. lineatus, d'Orb. ibid. t. xii. f. i.

Mission de San Jose, Prov. Chiquitos ( $O$ ).
14. Campylorhynchus unicolor, Lafr.

Picolaptes scolopaceus, d'Orb. \& Lafr. Syn. Av. i. p. 46.
Anumbius scolopaceus, d'Orb. Voy. Ois. p. 256.
Campylorhynchus unicolor, Lafr. Rev. Zool. 1846, p. 93 ; Scl. Cat. Am. B. p. 16.

Chiquitos, Santa Cruz, Guarayos and Yuracares (O.).
The specimen in Sclater's collection agrees with Lafresnaye's description of his $C$. unicolor, but not exactly with d'Orbigny's characters (Voy. p. 256).
15. Cyphorhinus modulator, D'Orb.

Troglodytes arada, d'Orb. \& Lafr. Syn. Av. i. p. 25.
Thryothorus modulator, d'Orb. Voy. Ois. p. 230.
Cyporhinus modulator, Scl. et Salv. Ex. Orn. p. 43.
Prov. Yungas (O.).
16. Henicorhina leucophrys (Tsch.).

Tilotilo (B.).
17. Thryophilus fulvus, Scl. P. Z. S. 1873, p. 781.

Troglodytes guarayanus, d'Orb. Voy. Ois. p. 203 (?).
Simacu (B.).
The type of d'Orbigny's Tr. guarayanus is not to be found in the Paris Museum ; so the question of its identity with T. fulvus must remain open.
18. Teryothorus melanops, Vieill.

Le Thryothore ì oreilles noires. T. melanos, Vieill. Enc. Méth. p. 628.

Troglodytes coraya, d'Orb. \& Lafr. Syn. Av. i. p. 25.
Thryothorus coraya, d'Orb. Voy. Ois. p. 229.
Carcuata, Prov. Yungas, Concepcion, Prov. Chiquitos ( $O$.) ; Simacu, Tilotilo (B.).

Vieillot's term melanos is, no doubt, a misprint for melanops. Bolivian specimens agree with others from Brazil.
19. Troglodytes furvus, d'Orb. \& Lafr.

Troglodytes furva, d'Orb. \& Lafr. Syn. Av. i. p. 26.
T. platensis, d'Orb. Voy. p. 131.

La Paz, Prov. Yungas, Sicasica, Valle Grande (O.) ; Ramosani, Caguarani (B.).
20. Troglodytes solstitialis, Scl.

Tilotilo (B.).
21. Cistothorus polyglottus (Vieill.).

Rhapaguaia (B.).
Fam. Motacillide.
22. Anthus bogotensis, Scl.

Anthus rufescens, d'Orb. \& Lafr. Syn. Av. i. p. 27; d'Orb. Voy. Ois. p. 226.

Anthus bogotensis, Scl. Cat. Am. B. p. 24; Ibis, 1878, p. 357.
Mountain of Biscachal, near Carcuata, Prov. Yungas (O.).
23. Anthus furcatus, d’Orb. \& Lafr. Syn. Av. i. p. 27 ; et d'Orb. Voy. p. 227 ; Sclater, Ibis, 1878, p. 364.

Cochabamba ( $O$.).

## Fam. Mniotilitide.

24. Parula pitiayumi (Vieill.).

Sylvia venustula, d'Orb. \& Lafr. Syn. Av. p. 20.
S. venusta, d'Orb. Voy. Ois. p. 218.

Prov. Yungas, Sicasica, Valle Grande (O.) ; Tilotilo (B.).
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25. Dendreca carulea (Wils.).

Nairapi, Tilotilo (B.).
This extends the southern range of this North-American species, already known from Bogota (Mus. P. L. S.) and Ecuador (Mus. S.-G).
26. Geothlypis velata (Vieill.).

Sylvia velata, d'Orb. \& Lafr. Syn. Av. i. p. 20 ; d'Orb. Voy. (is. p. 217.

Prov. Chiquitos (O.).
We have not examined Bolivian specimens of this species.
27. Basileuterus vermivorus (Vieill.).

Muscicapa vermivora, d'Orb. \& Lafr. Syn. Av. i. p. 51 ; d'Orb. Voy. Ois. p. 324.

Basileuterus vermivorus, Scl. P. Z. S. 1865, p. 283.
Between Santa Cruz de la Sierra and Chiquitos (O.).
Not seen by us from Bolivia, but quite likely to occur there, being widely distributed.
28. Basileuterus euophrys, Scl. \& Salv. P. Z. S. 1876, p. 352.

Tilotilo (B.).
29. Basileuterus bivittatus (d'Orb. \& Lafr.).

Muscicapa bivittata, d'Orb. \& Lafr. Syn. Av. i. p. 51.
Muscicapara bivittata, d'Orb. Voy. Ois. p. 324.
Carcuata, Prov. Yungas (0.); Simacu, Prov. Yungas (B.).
30. Basileuterus diachlorus, Cab. Journ. f. O. 1873, p. 316. Simacu, Consata (B.).
31. Basileuterus mesoleucus, Scl. P. Z. S. 1865, p. 286, pl. 9. fig. 1.

Yuyo (B.).
The single specimen sent by Mr. Buckley agrees with the type (Mus. P. L. S.), except in having the throat and breast rather more suffused with pale rufous. The rufous superciliary line is not shown; but this may be owing to the damaged state of Mr. Buckley's skin.
32. Setorhaga verticalis, d'Orb. \& Lafr. Syn. Av. i. p. 50 ; d'Orb. Voy. Ois. p. 330, t. xxxv. f. 1; Salvin, Ibis, 1878, p. 311 ;

Prov. Yungas (O.) ; Typuani, Prov. Yungas (B.).
33. Setophaga melanocephala (Tsch.); Salvin, Ibis, 1878, p. 312.

Simacu, Tilotilo (B.).
34. Setophaga brunneiceps, d'Orb. \& Lafr. Sgn. Av. i. p. 50 ; d'Orb. Voy. Ois. p. 329, t. xxxiv. f. 3, 4; Salvin, Ibis, 1878 , p. 312 .

Prov. Yungas (O.); Tilotilo, Prov. Yungas (B.).

Fam. Vireonide.
35. Vireosylyia oltvacea (Linn.).

Vireo virescens, d'Orb. \& Lafr. Syn. Av. i. p. 9.
Vireo olivaceus, d'Orb. Voy. Ois. p. 162.
Moxos, Chiquitos, Yungas and Yuracares (O.); Guanai, Prov. Yungas (B.).
36. Cyclorits, sp. inc.

Lamiagra guyanensis, d'Orb. \& Lafr. Syn. Av. i. p. 9; d'Orb. Voy. Ois. p. 160.

Cyclorhis viridis, Scl. Cat. Am. B. p. 46.
Chiquitos, Yungas, Ayupaya, and Rio Grande (O.).
A Bolivian Cyclorkis in Sclater's collection is certainly not C. viridis of the Argentine Republic, but comes nearest to C. flavipectus, although apparently different, having a much higher and more compressed bill, with a strong black patch at the base of the lower mandible.

## Fam. Hirundinide.

37. Progne purpurea (Linu.).

Hirundo purpurea, d'Orb. \& Lafr. Syn. Av. i. p. 68.
Mizque, Guarayos, Chiquitos ( $O$.).
38. Progne tapera (Linn.).

Hirundo fusca, d'Orb. \& Lafr. Syn. Av. i. p. 68.
Progne tapera, Scl. P. Z.S. 1872, p. 600.
Prov. Chiquitos (O.).
39. Hirundo andicola, d'Orb. \& Lafr. Syn. Av. i. p. 69 ; Scl. et Salv. P. Z. S. 1867, p. 984, et 1869, p. 151.

La Paz (O.).
40. Hirundo albiventris, Bodd.

Hirundo leucoptera, d'Orb. \& Lafr. Syn. Av. i. p. 69.
Moxos (O.).
We have specimens of this Swallow from Eastern Peru; aud it may doubtless occur in Bolivia.
41. Atticora fasciata (Gm.).

Yuyo, Cangali (B.) ; Prov. Yungas (O.).
This species appears to extend from Cayenne (Mus. P. L. S.), throughout Amazonia into Ecuador (Mus. P. L. S.) and Bolivia. The specimens from the last three localities have the white breastband much broader than the Cayenne bird.
42. Atticora cyanoleuca (Vieill.).

Hirundo cyanoleuca, d'Orb. \& Lafr. Syn. Av. i. p. 68.
Petrochelidon cyanoleuca, Scl. Cat. Am. B. p. 40.
Prov, Mosos (O.); Cangali, Tilotilo, Proy, Yungas (B.).
43. Stelgidopteryx ruficollis (Vieill.).

Hirundo favigastra, d’Orb. \& Lafr. Syn. Av. i. p. 69.
Yuyo (B.).
Bolivian specimens possibly belong to the Brazilian form, and not to the western S. uropygialis (Lawr.) ${ }^{1}$.

## Fam. Cerebide.

44. Diglossa sittoides (d'Orb. \& Lafr.).

Servirostrum sittoides, d'Orb. \& Lafr. Syn. Av. ii. p. 25; d'Orb. Voy. Ois. p. 374, t. lviii. f. 3.

Diglossa sittoides, Scl. Ibis, 1875, p. 208.
Chupé, Prov. Yungas, Chuquisaca and Valle Grande (O.).
45. Diglossa brunneiventris, Lafr.; Scl. Ibis, 1875, p. 211. Tilotilo, Khapaguaia, Prov. Yungas (B.).
46. Diglossa mystacalis, Lafr.; Scl. Ibis, 1875, p. 212.

Cillutincara, Prov. Yungas (B.).
47. Diglossa carbonaria, (d'Orb. \& Lafr.).

Servirostrum carbonarium, d'Orb. \& Lafr. Syn. Av. ii. p. 24; d'Orb. Voy. Ois. p. 373, t. lviii. f. 1, 2.

Diglossa carbonaria, Scl. Ibis, 1875, p. 213.
Cajapi, Prov. Yungas, Inquisivi, Prov. Sicasica, Palca, Prov. Ayupaya ( $O$.); Tilotilo, Prov. Yungas (B.).
48. Diglossa glauca, Scl. \& Salv. P. Z. S. 1876, p. 253.

Nairapi, Prov. Yungas (B.).
49. Diglossa personata, (Fraser); Scl. Ibis, 1875, p. 218.

Tilotilo, Caguarani, Prov. Yungas (B.).
50. Conirostrumi cyaneum, Tacz. P.Z.S. 1874, p. 312.

Tilotilo, Prov. Yungas (B.).
51. Conirostrum ferrugineiventre, Scl. P. Z. S. 1855, p. 74, Aves, pl. lexxv.; Scl. \& Salv. P. Z. S. 1874, pp. 511 et 678.

Sclater's original description of this species was based on specimens in the Derby Museum, collected by Bridges in Bolivia. Mr. Whitely and M. Jelski have both obtained it in Peru.
52. Conirostrum cinereum, d'Orb. \& Lafr. Syn. Av. ii. p. 25 ; d'Orb. Voy. Ois. p. 374, t. lix. f. 1.

Inquisivi, Prov. Sicasica ( $O$. ).
In Sclater's collection, from Bolivia (D. Forbes) and Peru (Jelski).

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{ }^{1} \text { Ibis, 1863, p. } 281 .
$$

53. Conirostrum atrocyaneum, Lafr. Rev. Zool. 1848, p. 9 . Tilotilo (B.).
This species is in our opinion quite distinct from C. albifrons of Colombia. Besides the blue head, the present bird differs in having the whole back except the upper tail-coverts of a dull black.
54. Dacnis cayana (Linn.).

Dacnis cyanater, d'Orb. \& Lafr. Syn. Ar. p. 21.
Dacnis cyanocephalus, d'Orb. Voy. Ois. p. 221.
Dacnis cayana, Scl. Ibis, 1863, p. 313.
Rio Tamapaya, Prov. Yungas, Santa Cruz de la Sierra, Territory of the Yuracares and Guarayos Indians ( $O$.).
55. Dacnis angelica, Bp.

Dacnis cayanus, d'Orb. \& Lafr. Syn. Av. p. 20; d'Orb. Voy. Ois. p. 221.

Dacnis melanotis et D. angelica, Scl. Ibis, 1863, p. 315.
Territory of the Yuracares Indians ( $O$.).
The name "angelica" having been published by Bonaparte in a footnote to his paper in the "Atti della sesta Riunione degli Scienziati Italiani'' (p. 404) in 1845, takes precedence over Strickland's melanotis (Contr. Orn. 1851, p. 16) for this species.
56. Dacnis flaviventer, d'Orb. \& Lafr. Syn. Av. i. p. 21 ; d'Orb. Voy. Ois. p. 220, t. xiii. f. 2; Scl. Ibis, 1863, p. 316.

Territory of the Yuracares Indians ( $O$.).
57. Chlorophanes atricapilla (Vieill.).

Ccereba atricapilla, d'Orb. \& Lafr. Syn. Av. ii. p. 24.
Territory of the Yuracares Indians (O.) ; Nairapi, Simacu, Prov. Yungas (B.).
58. Cereba cyanea (Linn.) ; d'Orb. \& Lafr. Syn. Av. ii. p. 34.

Territory of the Guarayos Indians (O.).
59. Cgreba cerulea (Linn.).

Tilotilo, Simacu, Nairapi, Prov. Yungas (B.).
60. Certhiola mexicana, Scl.

Certhiola faveola, d'Orb. \& Lafr. Syn. Ar. ii. p. 24.
Certhiola mexicana, Finsch, Verh. z.-b. Ges. Wien, 1871, p. 773.
Territory of the Guarayos Iudians (O.); Tilotilo, Baganti, Prov. Yungas ( $\boldsymbol{B}_{\text {. }}$ ).

## Fam. Tanagride.

61. Procnias tersa (Linn.).

Tersina carulea, d'Orb. \& Lafr. Syn. Av. i. p. 41.
Tersina tersa, d'Orb. Voy. Ois. p. 299.
Santa Cruz de la Sierra (O.) ; Tilotilo, Prov. Yungas (B.).
62. Chlorophonia viridis (Vieill.).

Tilotilo, Prov. Yungas (B.).
The single female example sent cannot be distinguished from the corresponding sex of this species.
63. Euphonia laniirostris, d'Orb. \& Lafr. Syn. Av. i. p. 30; d'Orb. Voy. Ois. p. 266, t. xxii. f. 1.

Euphonia crassirostris, Scl. P. Z. S. 1856, p. 103 et aliter.
Prov. Yungas and Santa Cruz de la Sierra, Territory of the Yuracares and Guarayos Indians (0.).

After examining a large series, we think $E$. crassirostris, originally established on Colombia specimens, cannot be safely distinguished from the Bolivian bird.
64. Euphonia chlorotica (Linn.).

Euphonia serrirostris, d'Orb. \& Lafr. Syn. Av. i. p. 30; d'Orb. Voy. Ois. p. 267, t. xxi. fig. 2.

Guarayos (O.); Tilotilo, Prov. Yungas (B.).
65. Euphonia ruficeps, d’Orb. \& Lafr. Syn. Av. i. p. 30; d'Orb. Voy. Ois. p. 268, t. xxii. f. 2.

Territory of the Yuracares Indians (O.); Tilotilo, Prov. Yungas (B.).
66. Euphonia chrysopasta, Scl. \& Salv.

Euphonia chrysupasta, Scl. \& Salv. P. Z. S. 1868, p. 438, pl. xxx. Simacu (B.).
67. Pipridea melanonota (Vieill.).

Tilotilo, Prov. Yungas (B.).
68. Pipridea castaneiventris, Scl. P. Z. S. 1866, p. 265.

Tilotilo, Prov. Yungas (Bo).
69. Calliste yeni (d'Orb. \& Lafr.).

Aglaia yeni, d'Orb. \& Lafr. Syn. Av. i. p. 270.
Tanagra yeni, d'Orb. Voy. Ois. p. 270, t. xxiv. f. 2.
Typuani, Tilotilo, Prov. Yungas (B.); Yungas and Yuracares (O.).
70. Calliste schranki (d'Orb. \& Lafr.).

Aglaia schranki, d'Orb. \& Lafr. Syn. Av. i. p. 270 ; d'Orb. Voy. Ois. p. 270, t. xxiv. f. i.

Territory of the Yuracares Indians (O.); Nairapi, Tilotilo, Prov. Yungas (B.).
71. Calliste punctulata, Scl. \& Salv. P.Z. S. 1876, p. 353.

Tilotilo, Prov. Yungas (B.).
72. Calliste pulchra (Tsch.).

Tilotilo, Prov. Yungas (Bo).
73. Calliste Gyroloides (Lafr.).

Aglaia gyrola, d’Orb. \& Lafr. Syn. Av. i. p. 32.
Tanagra gyrola, d'Orb. Voy. Ois. p. 272.
Calliste gyroloides, Scl. P. Z. S. 1856, p. 255.
Territory of the Yuracares and Guarayos Indians (a.).
74. Calliste boliviana, Bp.

Aglaia mexicana, d’Orb. \& Lafr. Syn. Av. i. p. 32.
Tanagra flaviventris, d'Orb. Voy. Ois. p. 271.
Calliste boliviana, Scl. P.Z. S. 1856, p. 258.
Territory of the Yuracares and Guarayos Indians (O.).
75. Calliste atrocerulea (Tsch.).

Nairapi, Tilotilo, Prov. Yungas (B.).
76. Calliste fulvicervix, Scl. \& Salv. P. Z. S. 1876, p. 354, pl. xxx. fig. 1.

Tilotilo, Prov. Yungas (B.).
77. Calliste argyrophenges, Scl. \& Salv. P. Z. S. 1876, p. 354, pl. xxx. fig. 2.

Tilotilo, Prov. Yungas (B.).
78. Calliste nigricincta (Bp.).

Mapiri, Prov. Yungas (B.).
79. Calliste cyaneicollis (d'Orb. \& Lafr.).

Aglaia cyaneicollis, d'Orb. \& Lafr. Syn. Av. i. p. 33.
Tanagra cyaneicollis, d'Orb. Voy. Ois. p. 271, t. xxv. f. 1.
Territory of the Yuracares Indians (O.); Ramosani, Tilotilo, Prov. Yungas ( $B$.).
80. Calliste cyanotis, Scl.

Calliste cyanotis, Scl. P. Z. S. 1858, p. 294, et Ibis, 1876, p. 408, pl. xii. fig. 2.

Tilotilo, Prov. Yungas (B.).
81. Calliste xanthocephala (Tsch.).

Calliste lamprotis, Scl. Contr. Orn. 1851, p. 65.
Calliste xanthocephala, Scl. P. Z. S. 1856, p. 264.
Juanani, Tilotilo, Prov. Yungas (B.).
C. lamprotis was established on a Bolivian example of this species in the British Museum obtained by Mr. Bridges. Subsequent researches showed it to be the same as C. xanthocephala (Tsch.).
82. Iridornis Jelseii, Cab. J. f. Orn. 1873, p. 316; Tacz. P. Z. S. 1874, p. 514.

Tilotilo, Prov. Yungas (O.).
83. Pecilothraupis igniventris (d’Orb. \& Lafr.).

Aglaia igniventris, d'Orb. \& Lafr. Syn. Av. i. p. 32.
Tanagra igniventris, d'Orb. Voy. Ois. p. 275, t. xxv. f. 2.
Prov. Apolobamba ( $O$. ); Tilotilo, Prov. Yungas (B.).
84. Buthraupis montana (d’Orb. \& Lafr.).

Aglaia montana, d'Orb. \& Lafr. Syn. Av. i. p. 32.
Tanagra montana, d'Orb. Voy. Ois. p. 275, t. xxiii. f. 1.
Carcuata, Prov. Yungas ( $O$.) ; Ramosani, Tilotilo, Prov. Yungas (B.).
85. Compsocoma flatinucha (d'Orb. \& Lafr.).

Tachyphonus favinucha, d'Orb. \& Lafr. Syn. Av. i. p. 29; d'Orb. Voy. Ois. p. 279, t. xxi. f. 1.

Chupé, Irupana, Suri, Prov. Yungas ( $O$.) ; Simacu, Tilotilo, Pror. Yungas ( $B$.).
86. Tanagra palmarum, Max.

Aglaia olivascens, d’Orb. \& Lafr. Syn. Av. i. p. 33.
Tanagra olivascens, d'Orb. Voy. Ois. p. 274.
Tanagra palmarum, Scl. Cat. Am. B. p. 76.
Cangalli, Prov. Yungas (B.).
Prov. Santa Cruz de la Sierra and Territory of the Yuracares and Guarayos Indians ( $O$.)
87. Tanagra sayaca, Linn.

Tanagra sayaca, Linn. S. N. i. p. 316.
Aglaia episcopus, d'Orb. \& Lafr. Syn. Av. i. p. 33.
T'anagra episcopus, d'Orb. Voy. Ois. p. 274, t. xxii. f. 3.
Thraupis sayaca, Cab. Mus. Hein. i. p. 28.
Cochabamba, Valle Grande, Yungas (O.); Sorata, Prov. Yungas (B.).
88. Tanagra darwini, Bp.; Scl. Cat. A. B. p. 76.

Sorata, Tilotilo, Prov. Yungas (B.).
89. Tanagra striata (Gm.).

Aglaia striata, d'Orb. \& Lafr. Syn. Av. i. p. 32.
Tanagra striata, d'Orb. Voy. Ois. p. 273, t. lxii. f. 3.
La $\operatorname{Paz}$ (O.); Cinti (B.).
90. Tanagra cyanocephala (d'Orb. \& Lafr.).

Aglaiáa cyanocephala, d'Orb. \& Lafr. Syn. Av. i. p. 32.
Tanagra maximiliani, d'Orb. Voy. Ois. p. 276, t. xxiii. f. 2.
Cochabamba, Inquisivi, Prov. Sicasica (O.) ; Ramosani, Tilotilo, Prov. Yungas (B.).
91. Rhamphocelus atrosericeus, d’Orb. \& Lafr. Syn. Av. i.
p. 34 ; d'Orb. Voy. Ois. p. 280, t. xxvi. f. i. ; Scl. Cat. Am. B. p. 79.

Chupé, Prov. Yungas; Prov. Moxos and Chiquitos, and Territory of the Yuracares and Guarayos Indians (O.). Ramosani, Prov. Yungas (B.).
92. Pyranga rubra (Linn.).

Pillon, Prov. Yungas (B.).
93. Pyranga azare (d'Orb.).

Pyranga mississipensis, d'Orb. \& Lafr. Syn. Av. i. p. 33.
Pyranga azarce, d'Orb. Voy. Oise p. 264.
Prov. Chiquitos, Yungas, Valle Grande ( $O$. ) ; Cangalli, Cinti (B.).
This Bolivian form is very closely allied to our P. testacea of Central America, but brighter beneath, and is quite distinct from P. saira of Brazil.
94. Phenicothraupis rubica (d’Orb. \& Lafr.).

Saltator rubicus, d’Orb. \& Lafr. Syn. Av. i. p. 36.
Pyranga rubica, d'Orb. Voy. Ois. p. 265.
Territory of the Yuracares and Guarayos Indians (O.).
95. Lanio versicolor (d’Orb. \& Lafr.).

Tachyphonus versicolor, d'Orb. \& Lafr. Syn. Av. i. p. 28.
Pyranga versicolor, d’Orb. Voy. Ois. p. 262, t. xix. f. 1.
Territory of the Yuracares Indians ( $O$.).
96. Malacothraupis dentata, Scl. \& Salv. P. Z.S. 1876, p. 354.

Tilotilo (B.).
97. Eucometis albicollis (d’Orb. \& Lafr.).

Pyranga albicollis, d’Orb. \& Lafr. Syn. Av. i. p. 33; d'Orb. Voy. Ois. p. 265, t. xxvi. f. 2.

Eucometis albicollis, Scl. Cat. Am. B. p. 84.
Mission de Santa Ana, Prov. Chiquitos (O.).
98. Tachyphonus luctuosus, d'Orb. \& Lafr. Syn. Av. i. p. 29.

Pyranga luctuosa, d'Orb. Voy. Ois. p. 263, t. xx. f. 12; Scl. Cat. Ann. B. p. 85.

Territory of the Yuracares and Guarayos Indians (O.).
99. Tachyphonus rufiventris (Spix).

Nairapi, Prov. Yungas (B.).
100. Cypsnagra ruficollis (Licht.).

Tachyphonus rufcollis, d'Orb. \& Lafr. Syn. Av. i. p. 29; d'Orb. Voy. Ois. p. 277.

Missions de Concepcion and de Santiago, Prov. Chiquitos (0.).
101. Nemosta pileata (Bodd.); d’Orb. \& Lafr. Syn. Af. i. p. 28 ; d'Orb. Voy. Ois. p. 261.

San Miguel and San Jose, Prov. Chiquitos (0.).
102. Nemosia guira (Linn.).

Nemosia nigricollis, d'Orb. \& Lafr. Syn. Av. i. p. 27 ; d'Orb. Voy. Ois. p. 260.

Nemosia guirina, Scl. Cat. Am. B. p. 87.
Rio Tarnampaya, Prov. Yungas, San Xavier, Prov. Chiquitos, and Territory of the Yuracares and Guarayos Indians (O.); Caguarani, Prov. Yungas (B.).
103. Nemosia flavicollis (Vieill.).

Simacu, Prov. Yungas (B.).
104. Nemosia ruficers (d'Orb. \& Lafr.).

Sylvia ruficeps, d'Orb. \& Lafr. Syn. Av. i. p. 20.
Hylophilus ruficeps, d'Orb. Voy. Ois. p. 219, t. xiii. f. 1.
Palca, Prov. Ayupaya (O.) ; Sorata, Tilotilo, Prov. Yungas (B.).
S. Baldomero, Bolivia (Forbes in Mus. P. L. S.).
105. Nemosia sordida, d'Orb. \& Lafr. Syn. Av. i. p. 28; d'Orb. Voy. Ois. p. 261, t. xviii. f. 2.

Territory of the Yuracares Indians ( $O$.).
106. Chlorospingus albitemporalis (Lafr.).

Sorata, Nairapi, Tilotilo, Prov. Yungas (B.).
107. Chlorospingus flavigularis, Scl. Cat. Am. B. p. 89.

Simacu, Prov. Yungas ( $B$ ) ).
108. Chlorospingus calophrys, Scl. \& Salv. P. Z.S. 1876, p. 354.

Tilotilo, Prov. Yungas (B.).
109. Chlorospingus castaneicollis, Scl. P. Z. S. 1858, p. 293.

Ramosani, Tilotilo, Prov. Yungas (B.).
110. Microspingus trifasclatus, Tacz. P. Z. S. 1874, p. 132 et p. 517 .

Tilotilo, Prov. Yungas (B.).
111. Buarremon torquatus (d'Orb. \& Lafr.).

Embernagra torquata, d’Orb. \& Lafr. Syn. Av. i. p. 34.
Arremon affinis, d'Orb. Voy. Ois. p. 282, t. xxvii. f. 1.
Carcuata, Prov. Yungas (O.) ; Ramosani, Tilotilo, Prov. Yungas (B.).
112. Buarremon melanops, Scl. \& Salv.

Buarremon rufinuchus, Scl. Cat. Am. B. p. 91 (nec d'Orb. \& Lafr.).

Buarremon melanops, Scl. \& Salv. P. Z. S. 1876, p. 253.
Simacu, Prov. Yungas ( 0. ),
113. Buarremon rufinucha (d'Orb. \& Lafr.).

Embernagra rufinucha, d'Orb. \& Lafr. Syn. Av. i. p. 35.
Arremon rufinucha, d'Orb. Voy. Ois. p. 283, t. xxvii. f. 2.
Yanacaché and Carcuata, Prov. Yungas (O.); Tilotilo, Prov. Yungas (B.).
114. Buarremon fulviceps (d'Orb. \& Lafr.).

Emberiza fulviceps, d’Orb. \& Lafr. Syn. Av. i. p. 77; d'Orb. Voy. Ois. p. 363, t. xlvi. f. 2.

Totora, Prov. Mizque ( $O$.) ; Tilotilo, Prov. Yungas ( $B$.).
This is a true Buarvemon, allied to B. semirufus, but distinguished by its yellow throat and breast.
115. Arremon orbignit, Scl.

Embernagra silens, d'Orb. \& Jafr. Syn. Av. i. p. 34.
Arremon silens, d'Orb. Voy. Ois. p. 281.
Arremon d'orbignii, Scl. P. Z. S. 1856, p. 81.
Prov. Yungas, Chiquitos, and Valle Grande (O.).
116. Cissopis minor, Tsch.

Saltator bicolor, d'Orb. \& Lafr. Syn. Av. i. p. 36.
Bethylus picatus, d'Orb. Voy. Ois. p. 269.
Cochabamba and Territory of the Yuracares Indians (O.).
We have not yet seen Bolivian skins of this species, but suppose that the Bolivian would be the same as the Peruvian form.
117. Psittospiza elegans (Tsch.).

Psittospiza elegans, Tacz. P. Z. S. 1874, p. 519.
Tilotilo, Prov. Yungas (B.).
118. Saltator magnus ( Gm .).

Mirkimarca, Tilotilo, Prov. Yungas (B.).
119. Saltator cervlescens, Vieill.; d’Orb. \& Lafr. Syn. Av. i. p. 35 ; d'Orb. Voy. Ois. p. 287, t. xxviii. f. 4, t. liv. f. 4. Santa Cruz (O.).
120. Saltator rufiventris, d'Orb. \& Lafr. Syn. Av. i. p. 35 ; d'Orb. Voy. Ois. p. 289, t. xviii. f. 2.

Inquisivi, Prov. Sicasica; Palca, Prov. Ayupaya (O.).
121. Saltator laticlavius, Scl. \& Saiv. P. Z. S. 1869, p. 151.

Saltator aurantiirostris, d'Orb. \& Lafr. Syn. Av. i. p. 35; d'Orb. Voy. Ois. p. 288, t. xxriii. f. 3 (partim).

Sorata, Tilotilo, Prov. Yungas (B.).
122. Saltator atricollis (Vieill.).

Saltator validus, d'Orb. \& Lafr. Syn. Av. i. p. 35.
Saltator atricollis, d'Orb. Voy. Ois. p. 288.
Santa Ana, Prov. Chiquitos (O.).
123. Orchesticus ater (Gm.).

Saltator atra, d'Orb. \& Lafr. Syn. Av. i. p. 36.
Saltator melanopsis, d'Orb. Voy. Ois. p. 291.
Ramosani, Prov. Yungas (B.).

## Fam. Fringillide.

124. Pheucticus aureiventris (d'Orb. \& Lafr.).

Pitylus aureoventris, d'Orb. \& Lafr. Syn. Av. i. p. 84 ; d'Orb. Voy. Ois. p. 365.

Pheucticus uureiventris, Scl. Cat. Am. B. p. 99.
Prov. Yuncas, Ayupaya, Sicasica, Mizqué, Chuquisaca, Chiquitos ( $O$.).
125. Guiraca cyanea (Linn.).

Pitylus cyaneus, d'Orb. \& Lafr. Syn. Av. i. p. 84.
Chiquitos (O.).
126. Oryzoborus torridus (Gm.).

Pytilus torridus, d'Orb. \& Lafr. Syn. Av. i. p. 85.
Prov. Chiquitos (O.).
127. Spermophila hypoxantha, Cab.

Pyrrhula minuta, d'Orb. \& Lafr. Syn. Av. i. p. 87.
Spermophila hypoxantha, Scl. Ibis, 1871, p. 3.
Chiquitos ( $O$.).
128. Spermophila nigrorufa (d'Orb. et Lafr.).

Pyrrhula nigrorufa, d'Orb. \& Lafr. Syn. Av. i. p. 88.
Spermophila nigrorufa, Scl. Ibis, 1871, p. 6.
Chiquitos ( $O$.).
129. Spermophila collaria (Linn.).

Pyrrhula melanocephala, d'Orb. \& Lafr. Syn. Av. i. p. 85.
Spermophila collaria, Scl. Ibis, 1871, p. 9.
Prov. Moxos, Territory of the Guarayos Indians ( $\boldsymbol{O}$.).
130. Spermophila cerulescens (Vieill.).

Pyrrhula ornata, d'Orb. \& Lafr. Syn. Av. i. p. 86.
Spermophila carulescens, Scl. Ibis, 1871, p. 12.
Simacu, Prov. Yungas (B.); Prov. Yungas (O.).
131. Spermophila lineola (Linn.).

Pyrrhula lineola, d'Orb. \& Lafr. Syn. Av. i. p. 86.
Spermophila lineola, Scl. Ibis, 1871 , p. 13.
Chiquitos, Guarayos (O.).
132. Spermophila luctuosa (Lafr.), Spermophila luctuosa, Scl. Ibis, 1871, p. 15. Simacu, Prov. Yungas (B.).
133. Spermophila bicolor (d’Orb. \& Lafr.).

Pyrrhula bicolor, d'Orb. \& Lafr. Syn. Av. i. p. 86.
Spermophila bicolor, Scl. Cat. Am. B. p. 103, et Ibis, 1871, p. 17.

Moxos (O.).
134. Spermophila plumbea (Max.).

Pyrrhula cinerea, d'Orb. \& Lafr. Syn. Av. i. p. 87.
Spermophila plumbea, Scl. Ibis, 1871, p. 19.
Chiquitos (O.).
135. Volatinia tacarina (Linn.).

Emberiza jacarini, d'Orb. \& Lafr. Syn. Av. i. p. $४ 1$.
Santa Cruz de la Sierra ( $O$.) ; Consata, Tilotilo, Prov. Yungas (B.).
136. Paroaria cervicalis, Scl. Cat. Am. B. p. 108.

The type of this species remains unique in Sclater's collection. It was obtained, along with a lot of other birds mostly, if not all, from Bolivia, of a London dealer in 1853.
137. Coryphospingus cristatus (Gm.).

Emberiza araguira, d'Orb. \& Lafr. Syn. Av. i. p. 81.
Coryphospingus cristatus, Scl. Cat. Am. B. p. 109.
Tilotilo, Prov. Yungas (B.) ; Prov. Yungas, Chiquitos (O.).
138. Coryphospingus griseo-cristatus (d'Orb. \& Lafr.).

Emberiza griseo-cristata, d'Orb. \& Lafr. Syn. Av. i. p. 79; d'Orb. Voy. Ois. p. 363, t. xlvii. f. 1.

Coryphospingus griseocristatus, Scl. Cat. Am. B. p. 109.
Cochabamba, Mizqué, Valle Grande (O.); Tilotilo, Prov. Yungas (B.).
139. Poospiza torquata (d'Orb. \& Lafr.).

Emberiza torquata, d'Orb. \& Lafr. Syn. Av. i. p. 82.
Poospiza torquata, Scl. Cat. Am. B. p. 110.
Sicasica ( 0. ); Tilotilo, Prov. Yungas (B.).
140. Poospiza hypochondriaca (d'Orb. \& Lafr.).

Emberiza hypochondriaca, d'Orb. \& Lafr. Syn. Av. i. p. 80; d'Orb. Voy. Ois. p. 361, t. xlv. f. 1.

Tilotilo, Prov. Yungas (B.). Inquisivi, Prov. Sicasica, Palca, Prov. Ayupaya (O.).
141. Poospiza melanoleuca (Vieill.).

Emberiza melanoleuca, d’Orb. \& Lafr. Syn. Av. i. p. 82.
Chiquitos ( 0 .).
142. Phrygilus caniceps, Burm.

Emberiza gayi (stirps major), d'Orb. \& Lafr. Syn. Ar. i. p. 75.
Phrygilus caniceps, Scl. \& Salv. Ibis, 1878, p. 393.
La Paz (O.); Tilotilo (B.).
143. Phrygilus atriceps (d’Orb. \& Lafr.).

Emberiza atriceps, d'Orb. \& Lafr. Syn. Av.i. p. 76; d'Orb. Voy. Ois. p. 363, t. xlvii. f. 2.

Oruro and Potosi ( $O$.).
144. Phrygilus unicoion (d'Orb. \& Lafr.).

Emberiza unicolor, d'Orb. \& Lafr. Syn. Av. i. p. 79.
Phrygilus unicolor, Scl. Cat. Am. B. p. 111.
Emberiza guttata, d'Orb. \& Lafr. Syn. Av. i. p. 78 (ㅇ).
Pampa de Oruro and Sicasica (O.).
Mus. P. L. S. ex Bolivia (Bridges et D. Forbes).
145. Phrygilus fruticeti (Kittl.).

Emberiza luctuosa, d'Orb. \& Lafr, Syn. Av. i. p. 80.
Phrygelus fruticeti, Scl. Cat. Am. B. p. 111.
La Paz (O.) ; Tilotilo, Prov. Yungas (B.).
146. Diuca speculifera (d'Orb. \& Lafr.).

Emberiza speculifera, d'Orb. \& Lafr. Syu. Ar. i. p. 78; d'Orb. Voy. Ois. p. 362, t. xlvi. f. 1.

Diuca speculifera, Scl. Cat. Am. B. p. 111.
Prov. Yungas, and Palca, Prov. Ayupaya (0.).
147. Catamenia analis (d'Orb. \& Lafr.).

Linaria analis, d’Orb. \& Lafr. Syn. Av. i. p. 83; d'Orb. Voy. Ois. p. 364, t. xlviii. f. I.

Catamenia analis, Scl. Cat. Am. B. p. 105.
Sorato, Prov. Yungas (B.); La Paz, Inquisivi, Cochabamba, Totora and Chuquisaca ( 0. ).
148. Zonotrichia pileata (Bodd.).

Emberiza matutina, d'Orb. \& Lafr. Syn. Av. i. p. 80.
Zonotrichia pileata, Scl. Cat. A. B. p. 113.
Bolivia (0.) ; Sorata, Nairapi, Pror. Yungas (B.).
149. Coturniculus peruanus, Bp.

Emberiza mainimbe, d’Orb. \& Lafr. Syn. Ar. i. p. 77.
Coturniculus peruanus, Scl. Cat. Am. B. p. 117.
Santa Cruz (O.).
150. Embernagra olivascens, d'Orb. Voy. Ois. p. 285.

Inquisivi, Prov. Sicasica, Palca, Prov. Ayupaya, Cochabamba (O);

- Tilotilo, Prov, Yungas (B.).

151. Emberizoides sphenurus (Vieill.); Scl. Cat. Am. B. p. 118.

An example of this species in Sclater's collection, obtained through Cuming in 1854, is believed to have been collected in Bolivia by Bridges.
152. Chrysomitris magellanica (Vieill.).

Carduelis magellanicus, d’Orb. \& Lafr. Syn. Av. i. p. 83.
Chrysomitris barbata, Scl. Cat. Am. B. p. 125.
Prov. Chiquitos, (0.).
153. Chrysomitris atrata (d'Orb. \& Lafr.).

Cardualis atratus, d'Orb. \& Lafr. Syn. Av. i. p. 83 ; d'Orb. Voy. Ois. p. 364, t. xlviii. f. 2.

Chrysomitris atrata, Scl. Cat. Am. B. p. 125.
La Paz (0.).
Mus. P. L. S. ex Bolivia (Bridges).
154. Chrysomitris xanthogastra (Du Bus).

Chrysomitris æanthogastra3 Scl. \& Salv. P. Z. S. 1870, p. 785.
Sorata, Nairapi, Prov. Yungas (B.).
Bolivia (Forbes in Mus. P. L. S.).
155. Sycalis flaveola (Linn.).

Emberiza brasiliensis, d’Orb. \& Lafr. Syn. Av. i. p. 73.
Sycalis faveola, Scl. Ibis, 1872, p. 41.
Santa Cruz de la Sierra (0.).
156. Sycalis luteola (Sparrm.).

Sycalis luteola, Scl. Ibis, 1872, p. 44.
Tilotilo, Prov. Yungas (B.).
157. Sycalis lutea (d'Orb. \& Lafr.).

Emberiza lutea, d'Orb. \& Lafr. Syn. Av. i. p. 74.
Sycalis lutea, Scl. Ibis, 1872, p. 46, pl. ii. fig. 2.
Crithagra chloropsis, Bp. Consp. i. p. 46.
Andes of Bolivia (O.).
Prince Bonaparte's Crithagra chloropsis was founded on Bolivian specimens of this species obtained by Pentland.
158. Sycalis luteocephala (d'Orb. \& Lafr.).

Emberiza luteocephala, d’Orb. \& Lafr. Syn. Av. i. p. 74; d’Orb. Voy. Ois. p. 360, t. xliv. f. 2.

Sycalis luteocephula, Scl. Ibis, 1872, p. 46.
Cochabamba, Valle Grande, Chuquisaca (O.).

## Fam. Icteride.

159. Ostinops yuracarium (d'Orb. \& Lafr.).

Cassicus yuracares, d'Orb. \& Lafr. Syn. Av. ii. p. 2; d'Orb. Voy. Ois. p. 365, t. li. f. 1.

Territory of the Yuracares Indians, Prov. Cochabamba (O.).
160. Ostinops cristatus (Gm.).

Cassicus cristatus, d'Orb. \& Lafr. Syn. Ar. ii. p. 2.
Prov. Yungas (O.); Tilotilo, Prov. Yungas (B.).
161. Ostinops atrovirens (d’Orb. \& Lafr.).

Cassicus atrovirens, d'Orb. \& Lafr. Syn. Av. ii. p. 1; d'Orb. Voy. Ois. p. 366, t. li. f. 2.

Yanacaché, Chulumani, Irupana, Cajuata, Prov. Yungas (O.); Simacu, Tilotilo, Prov. Yungas (B.).
162. Cassicus persicus (Linn.).

Cassicus icteronotus, d'Orb. \& Lafr. Syn. Av. ii. p. 3.
Cassiculus flavicrissus, Scl. Cat. Am. B. p. 129 (partim).
Prov. Chiquitos (O.); Mapiri, Prov: Yungas (B.).
163. Cassicus chrysonotus, d'Orb. \& Lafr. Syn. Av. ii. p. 3 ; d'Orb. Voy. Ois. p. 367, t. lii. f. 1.

Ramosani, Tilotilo, Prov. Yungas (B.); Charapaccé, Prov. Yungas, Morochata, Prov. Ayupaya (O.).
164. Cassicus solitarius (Vieill.) ; d’Orb. \& Lafr. Syn. Av. ii. p. 3; Scl. Cat. Am. B. p. 130.

Territory of the Yuracares Indians (O.).
165. Icterus pyrrhopterus (Vieill.); Scl. Cat. Am. B. p. 131.

Tilotilo, Prov. Yungas (B.).
Obtained by d'Orbigny at Corrientes.
166. Icterus croconotus, Wagl.; Scl. Cat. Am. B. p. 133.

Icterus jamaicensis, d’Orb. \& Lafr. Syn. Av. ii. p. 6.
Santa Cruz (O.).
167. Molothrus badius (Vieill.).

Icterus badius, d'Orb. \& Lafr. Syn. Av. ii. p. 7.
Cochabamba, Sicasica (O.) ; Tilotilo, Prov. Yungas (B.).
168. Leistes superciliaris, Bp.

Icterus militaris, d'Orb. \& Lafr. Syn. Av. ii. p. 4.
Leistes superciliaris, Scl. Cat. Am. B. p. 138.
Santa Cruz, Chiquitos (O.).

## Fam. Corvide.

169. Cyanocitta viridicyanea (d'Orb. \& Lafr.).

Garrulus viridicyaneus, d'Orb. \& Lafr. Syn. Av. ii. p. 9 ; d’Orb. Voy. Ois. p. 368, t. liii. f. 1.

Cajapi, La Paz (O.) ; Ramosani, Tilotilo, Prov. Yungas (B.).
170. Cyanocorax incas (Bodd.).

Garrulus perwianus, d'Orb. \& Lafr. Syn. Av. ii. p. 9.
Xanthura incas, Scl. Ibis, 1879, p. 89.
Apolobamba (O.); Tilotilo, Prov. Yungas (B.).
171. Cyanocorax chrysops (Vieill.).

Garrulus chrysops, d'Orb. \& Lafr. Syn. Av. ii. p. 9.
Cyanocorax chrysops, Sharpe, Cat. B. iii. p. 120.
Prov. Chiquitos ( $O$. ) ; Cinti (B.).
172. Cyanocorax cyanomelas (Vieill.).

Pica cyanomelas, Vieill. (ex Azara).
Garrulus cyanomelas, d'Orb. \& Lafr. Syn. Av. ii. p. 9.
Cyanocorax nigriceps, Scl. \& Salv. P. Z. S. 1876, p. 354.
Cyanocorax chilensis, Sharpe, Cat. B. iv. p. 125.
Tilotilo, Prov. Yungas (B.).
Since we have distinguished the Bolivian form of this species as C. nigriceps we have had an opportunity of examining a skin from Corrientes, which, there can be no doubt, is identical with the Paraguayan form (i. e. cyanomelas, Vieill. ex Azara). The result is that the Bolivian bird, if not precisely similar to the Corrientes form, is much too near to be separated from it, and that the S. Brazilian form (C. cyanomelas, Sharpe), will require a new name, if it is to be kept distinct.

It is possible that Bonaparte's Psilorhinus chilensis may, as Mr. Sharpe conjectured, have been based on an example of this species ; but this name ought not to have been adopted, for two reasons: (1) the diagnosis is altogether insufficient ; (2) the locality implied in the name is erroneous.

## Fam. Tyrannide.

173. Agriornis livida (Kittl.).

Pepoaza gutturalis, d’Orb. \& Lafr. Syn. Av. i. p. 351.
Pepoaza andecola, d'Orb. Voy. Ois. p. 351.
Agriornis livida, Scl. Cat. Am. B. p. 196.
Plateau of the Andes (O.).
174. Agriornis maritima (d'Orb. \& Lafr.).

Pepoaza maritima, d'Orb. \& Lafr. Syn. Av. i. p. 65; d'Orb. Voy. Ois. p. 353.

Cobija and desert of Atacama (O.).
Proc. Zool. Soc.-1879, No. XXXIX.
175. Agriornis insolens, Scl. et Salv. P. Z. S. 1869, p. 153.

Sorata, Prov. Yungas (B.).
176. Myiotheretes striaticollis, Scl.

Tyrannus rufiventris, d'Orb. \& Lafr. Syn. Av. i. p. 45 ; d'Orb. Vor. Ois. p. 312, t. xxxii. f. 3, 4.

Tcenioptera striaticollis, Scl. P. Z. S. 1851, p. 193, pl. xlii.
Myiotheretes striaticollis, Scl. Cat. A. B. p. 197.
Sorata, Tilotilo, Prov. Yungas (B.) ; Rio Miguella, Prov. Yungas, (0.).
177. Tenioptera nengeta (Linn.).

Pepoaza polyglotta, d'Orb. \& Lafr. Syn. Av. i. p. 62 ; d'Orb. Voy. Ois. p. 346, t. xxxix. f. 4.

Trenioptera nengeta, Scl. Cat. A. B. p. 197.
Prov. Chiquitos (0.).
178. Tenioptera velata (d'Orb. \& Lafr.).

Pepoaza velata, d'Orb. \& Lafr. Syn. Av. i. p. 62 ; d’Orb. Voy. Ois. p. 347.
Tanioptera velata, Scl. Cat. Am. B. p. 197.
Environs of Santa Cruz de la Sierra (O.).
179. Tenioptera irupero (Vieill.).

Pepoaza nivea, d'Orb. \& Lafr. Syn. Av. i. p. 62.
Pepoaza irupero, d'Orb. Voy. Ois. p. 348.
Tenioptera irupero, Scl. Cat. Am. B. p. 198.
Prov. Chiquitos (O.).
180. Ochthodieta fusco-rufus, Scl. \& Salv. P.Z. S. 1876 , p. 354 .

Tilotilo, Prov. Yungas (B.).
181. Ochtheca gnanthoides (d'Orb. \& Lafr.).

Fluricola æenanthoides, d'Orb. \& Lafr. Syn. Av. i. p. 60; d'Orb.
Voy. Ois. p. 344, t. xxxiii. f. 2.
Valley of La Paz (O.); Mapiri, Prov. Yungas (B.).
182. Ochtheeca leucophrys (d’Orb. \& Lafr.).

F'uvicola leucophrys, d'Orb. \& Lafr. Syn. Av. i. p. 60; d'Orb. Voy. Ois p. 345, t. xxxvii. f. 1.

La Paz and Inquisivi, Prov. Sicasica (O.); Tilotilo, Prov. Yungas (B.).
183. Ochtheca pulchella, Scl. \& Salv. P. Z. S. 1876, p. 355 Tilotilo, Prov. Yungas (B.).
184. Ochtheca rufipectoralis (d'Orb. \& Lafr.).

Fhuvicola rufipectoralis, d'Orb. \& Lafr. Syn. Av. i. p. 60 ; d'Orb. Voy. Ois. p. 345, t. xxxvii, f. 2.

Palca, Prov. Ayupaya (O.); Ramosani, Tilotilo, Prov. Yungas (B.).
185. Осhtheca thoracica, Tacz. P. Z. S. 1864, p. 133.

Tilotilo, Prov. Yungas (B.).
186. Осhtheca setophagoides (Bp.).

Muscicapa leucophrys, d’Orb. \& Lafr. Syn. Ar. i. p. 53.
Muscicapara leucophrys, d'Orb. Voy. p. 327.
Bolivia (O.) ; Tilotilo, Prov. Yungas (B.),
The typical specimen of Muscicapa leucophrys, d'Orb. \& Lafr., at Paris, belongs to this species; but there being already a species of the genus of the same name (also named by d'Orb. \& Lafr.) we retain Bonaparte's later appellation.
187. Fluvicola albiventris (Spix).

Fluvicola bicolor, d'Orb. \& Lafr. Syn. Av. i. p. 58; d'Orb. Voy. Ois. p. 343, t. lvii. f. 2.

Fluvicola albiventris, Scl. Cat. Am. B. p. 200.
Prov. Chiquitos ( 0. .).
188. Arundinicola leucocephala (Linn.).

Alectrurus leucocephalus, d'Orb. \& Lafr. Syn. Av. i. p. 54.
Arundinicola leucocephala, d'Orb. Voy. Ois. p. 334.
Provinces of Moxos and Chiquitos ( 0. ).
189. Alectorurus tricolor (Vieill.).

Alectrurus tricolor, d'Orb. \& Lafr. Syn. Av. i. p. 54 ; d'Orb. Voy. Ois. p. 341.

Guarayos, Prov. Moxos (0.).
190. Cybernetes yetapa (Vieill.).

Gubernetes yperu, d'Orb. \& Lafr. Syn. Av. i. p. 58.
Alectrurus yetapa, d'Orb. Voy. Ois. p. 342.
Prov. Chiquitos (O.).
191. Sisopygis icterophrys (Vieill.).

Fluvicola icterophrys, d'Orb. \& Lafr. Syn. Av. i. p. 59.
Suiriri icterophrys, d'Orb. Voy. Ois. p. 338, t. xlv. f. 3.
Sisopygis icterophrys, Scl. Cat. A. B. p. 202.
Provinces of Chuquisaca and Sicasica (O.).
192. Cnipolegus aterrimus (d'Orb.).

Fluvicola nigerrima, d'Orb. \& Lafr, Syn, Av. i. p. 59.

Ada nigerrima, d'Orb. Voy. Ois. p. 340.
Cnipolegus aterrimus, Scl. Cat. Am. B. p. 202.
Provinces of Yungas, Ayupaya, Cochabamba, Chuquisaca (0.); Sorata, Tilotilo, Prov. Yungas (B.).
193. Lichenops perspicillata (Gm.).

Fluvicola perspicillata, d'Orb. \& Lafr. Syn. Av. i. p. 58.
Ada perspicillata, d'Orb. Voy. Ois. p. 339.
Lichenops perspicillata, Scl. Cat. Am. B. p. 203.
Prov. Cbiquitos (0.).
194. Machetornis rixosa (Vieill.).

Pepoaza rixosu, d'Orb. \& Lafr. Syn. Av. i. p. 62 ; d’Orb. Voy. Ois. p. 350, t. li. f. 4 (egg).

Machetornis rixosa, Scl. Cat. Am. B. p. 204.
Provinces of Santa Cruz de la Sierra, Chiquitos, and Moxos (0.).
195. Muscisaxicola rufivertex, d'Orb. \& Lafr., Syn. Av. i. p. 66 ; d'Orb. Voy. Ois. p. 354, t. xl. f. 2 ; Scl. Cat. Am. B. p. 205.

Plateau of the Andes, La Paz, and Cobija (O.).
196. Muscisaxicola méntalis, d’Orb. \& Lafr. Syn. Av. i. p. 66; d'Orb. Voy. Ois. p. 35̄5, t. xli. f. 1.

Cobija, West coast of Bolivia (O.).
197. Muscisaxicola maculirostris, d’Orb. \& Lafr. Syn. Av. i. p. 66 ; d'Orb. Voy. Ois. p. 356, t. xli. f. 2.

La Paz ( 0. ) ; Tilotilo, Prov. Yungas (B.).
198. Centrites oreas, Scl. \& Salv. P. Z. S. 1869, p. 154, et Ex. Orn. p. 191, t. xcvi.; Allen, Bull. Mus. Comp. Zool. iii. p. 354.

Anthus fulvus, d'Orb. Voy. Ois. p. 223 (partim).
Quite common on the shores of Lake Titicaca (Garman).
199. Todirostrum cinereum (Linn.) ; d'Orb. \& Lafr. Syn. Av. i. p. 46 ; d.Orb. Voy. Ois. p. 315.

Mission de la Concepcion, Prov. Moxos (O.).
200. Euscarthmus gularis (Temm.).

Todirostrum gulare, d'Orb. \& Lafr. Syn. Av. i. p. 46; d'Orb. Voy. Ois. p. 315.

Carcuata, Prov. Yungas, Santo Corazon, Prov. Chiquitos (O.). Simacu, Prov. Yungas (B.).
201. Euscarthmus margaritaceiventris (d'Orb. \& Lafr.).

Todirostrum margaritaceiventris, d'Orb. \& Lafr. Syn. Ar. i. p. 46 ; d'Orb. Voy. Ois. p. 316, t. xxxiii. f. 3, 4.

Euscarthmus margaritaceiventris, Scl. \& Salv. Nomencl. p. 45.
Santa Corazon, Prov. Chiquitos (O.).
202. Orchilus ecaudatus (d'Orb. \& Lafr.).

Todirostrum ecaudatum, d'Orb. \& Lafr. Syn. Av. i. p. 47 ; d'Orb. Voy. Ois. p. 316, t. xxxiii. f. 1, 2.

Orchilus ecaudatus, Scl. \& Salv. P. Z. S. 1868, p. 631.
Territory of the Yuracares Indians ( $O$.).
203. Stigmatura budytoides (d’Orb. \& Lafr.).

Culicivora budytoides, d'Orb. \& Lafr. Syn. Ar. i. p. 56.
Setophaga budytoides, d'Orb. Voy. Ois. p. 330.
Stigmatura budytoides, Scl. \& Salv. P. Z. S. 1866, p. 188.
Valley of Chaluani, Prov. Mizqué (O.).
204. Serphophaga subcristata (Vieill.).

Muscicapa cristata, d’Orb. \& Lafr. Syn. Av. i. p. 52.
Muscicapara subcristata, d'Orb. Voy. Ois. p. 326.
Serphophaga subcristata, Scl. \& Salv. Nomencl. p. 47.
Prov. Chiquitos (O.); Tilotilo, Prov. Yungas (B.).
205. Serphophaga cinerea (Strickl.).

Serpophoga cinerea, Scl. Cat. A. B. p. 211.
Baganti, Pror. Yungas (B.).
206. Aneretes parulus (Kittl.).

Culicivora parulus, d'Orb. \& Lafr. Syn. Av. i. p. 57 ; d'Orb. Voy. Ois. p. 332 (Chili).

Yuyo, Prov. Yungas ( $B_{\text {i }}$ ).
207. Aneretes flavirostris, Scl. \& Salv. P. Z. S. 187 p. 355.

Tilotilo, Prov. Yungas (B.).
208. Mionectes oleagineus (Licht.).

Muscicapa chloronota, d'Orb. \& Lafr. Syn. Av. i. p. 51.
Muscicapara oleaginea, d'Orb. Voy. Ois. p. 323.
Mionectes oleagineus, Scl. Cat. Am. B. p. 213.
Territory of the Yuracares Indians ( $O$.).
209. Mionectes striaticollis (d'Orb. \& Lafr.).

Muscicapa strieticollis, d'Orb. \& Lafr. Syn. Av. i. p. 51.
Muscicapara striaticollis, d'Orb. Voy. Ois. p. 323. t. xxxv. f. 2.
Prov. Yungas and Territory of the Yuracares Indians ( $O$.) ; Tilotilo, Prov. Yungas (B.).
210. Leptopogon superciliaris (Cab.).

Leptopogon superciliaris, Scl. Cat. A. B. p. 214.
Carguarani, Prov. Yungas (B.).
211. Leptopogon tristis, Scl. \& Salv. P. Z. S. 1876, p. 254.

Simacu, Prov. Yungas (B.).
212. Tyranniscus gracilipes, Scl. \& Salv. P. Z. S. 1867, p. 981 .

Simacu, Prov. Yungas (B.).
213. Tyranniscus viridissimus, Scl. P. Z. S. 1873, p. 782.

Tilotilo, Prov. Yungas (B.).
214. Elainea albiceps (d’Orb. \& Lafr.).

Muscipeta albiceps, d'Orb. \& Lafr. Syn. Av. i. p. 47; d'Orb. Voy. Ois. p. 319.

Elainea albiceps, Scl. P. Z. S. 1870, p. 834.
Prov. Yungas. (O.).
215. Elainea elegans, Pelz. Orn. Bras. p. 179 ; Scl. P. Z. S. 1870, p. 835.

Simacu, Prov. Yungas (B.).
216. Empidagra suiriri (Vieill.).

Muscicapa suiriri, d'Orb. \& Lafr. Syn. Av. i., p. 51.
Suiriri suiriri, d'Orb. Voy. Ois. p. 336.
Pachyrhynchus albescens, Gould, Zool. Beagle, iii. p. 51, pl. xiv.
Empidagra suiriri, Cab. Mus. Hein. ii. p. 59.
Provinces of Moxos and Chiquitos ( $O$.).
217. Legatus albicollis (Vieill.).

Muscipeta albicollis, d’Orb. \& Lafr. Syn. Av. i. p. 47; d'Orb. Voy. Ois. p. 317.

Rio de San Miguel, Territory of the Guarayos Indians (O.).
218. Myiozetetes similis (Spix).

Muscipeta cayennensis, d'Orb. \& Lafr. Syn. Av. i. p. 47 ; d'Orb. Voy. Ois. p. 317.

Myiozetetes similis, Scl. Cat. Am. B. p. 224.
Rio Blanco and Rio Itonama, Prov. Moxos (O.).
219. Elainea obscura (d'Orb. \& Lafr.).

Muscipeta obscurá, d'Orb. \& Lafr. Syn. Av. i. p. 48.
M. guillemini, d'Orb. Voy. Ois. p. 319.

Elainea obscura, Scl. P. Z. S. 1870, p. 835.
Prov. Yungas (O.) ; Tilotilo, Prov. Yungas (B.).
220. Pitangus bellicosus (Vieill.).

Tyrannus sulphuratus, d'Orb. \& Lafr. Syn. Av. i. p. 42 ; d'Orb. Voy. Ois. p. 304, tt. xxxiv. f. 3, xlix. f. 3.

Pitangus bellicosus, Scl. Cat. Am. B. p. 222.
Provinces of Chiquitos, Cochabamba, Chuquisaca (O.).
221. Myrodynastes solitarius (Vieill.).

Tyrannus audax, d’Orb. \& Lafr. Syn. Av. i. p. 43; d’Orb. Voy. Ois. p. 305.

Myiodynastes solitarius, Scl. Cat. Am. B. p. 223.
Santa Cruz de la Sierra and Chiquitos (O.).
222. Muscivora swainsoni (Pelz.).

Muscipeta regia, d'Orb. Voy. Ois. p. 317.
Muscivora swainsoni, Scl. Cat. Am. B. p. 224.
Territory of the Yuracares Indians (O.).
223. Hirundinea rupestris (Max.).

Hirundinea bellicosa, d'Orb. \& Lafr. Syn. Av. i. p. 46 ; d'Orb. Voy. Ois. p. 314.
H. rupestris, Scl. Ibis, 1869, p. 196.
H. bellicosa, Reinh. Fuglef. Bras. Campos, p. 144.

Tilotilo, Prov. Yungas (B.).
Mission de Santiago, Prov. Chiquitos, Cochabamba, Chuquisaca, Chaluani ( $O$.).

Bolivian examples of this species do not differ appreciably from the Brazilian bird.
224. Myiobius villosus, Scl. ; Scl. \& Salv. anteè, p. 514.

Tilotilo, Prov. Yungas (B.).
225. Myiobius cinnamomeus (d'Orb. \& Lafr.).

Muscipeta cinnamomea, d'Orb. \& Lafr. Syn. Av. i. p. 49.
M. vieilloti, d'Orb. Voy. Ois. p. 321, t. xxxiv. f. 1, 2.
M. cinnamomeus, Scl. Cat. p. 226.

Prov. Yungas (O.) ; Simacu, Prov. Yungas (B.).
226. Myiobius nevius (Bodd.).

Muscipeta virgata, d'Orb. \& Lafr. Syn. Av. i. p. 49 ; d'Orb. Voy. Ois. p. 320.

Myiobius navius, Scl. Cat. Am. B. p. 227.
Provinces of Moxos, Chiquitos, and Yungas (O.).
227. Empidochanes, sp. inc.

Nairapi, Prov. Yungas (B.).
One bad skin of a species allied to $E$. olivus (Bodd.).
228. Contopus richardsoni (Sw.); Scl. Cat. Am. B. p. 231. Nairapi, Prov. Yungas (B.).
229. Contopus ardesiacus (Lafr.); Scl. \& Salv. Nomencl. p. 52. Myiochanes ardesiacus, Scl. Cat. p. 232.
Tilotilo, Prov. Yungas (B.).
230. Empidonomus varius (Vieill.) ; Scl. Cat. Am. B. p. 234.

Mapari, Pror. Yungas (B.).
231. Myiarchus tyrannulus (Müll.).
M. ferox, d'Orb. \& Lafr. Syn. Av. i. p. 43 ; d'Orb. Voy. Ois. p. 306.

Myiarchus swainsoni, Scl. Cat. Am. B. p. 233.
M. tyrannulus, Scl. \& Salv. Nomencl. p. 52.

Provinces of Yungas, Moxos, Chiquitos, and Santa Cruz de la Sierra (O.) ; Typuani, Tilotilo, Prov. Yungas (B.).
232. Myiarchus nigriceps, Scl.

Myiarchus tuberculifer, d'Orb. \& Lafr. Syn. Av. i. p. 43; d'Orb. Voy. Ois. p. 307, t. xxxii. fig. 2 (?).
MI. nigriceps, Scl. P.Z.S. 1860, p. 68.

We suspect that M. tuberculifer is the same as M. niyriceps, in some individuals of which, as in other Tyrannidæ, the tubercles on the wing are much more developed than in others.

Tilotilo, Prov. Yungas (B.).
233. Tyrannus pipiri (Vieill.).

Tyrannus animosus, d'Orb. \& Lafr. Syn. Av. i. p. 45.
Tyrannus intrepidus, d'Orb. Voy. Ois. p. 313.
Tyrannus pipiri, Scl. Cat. p. 236.
Santa Cruz de la Sierra (O.).
234. Tyrannus aurantio-atrocristatus, d'Orb. \& Lafr. Syn. Av. i. p. 45 ; d'Orb. Voy. Ois. p. 312.

Tyrannus inca, Scl. Cat. Am. B. p. 237.
Valle Grande (O.).
In Sclater's collection from Bolivia; obtained by E. Bartlett at Xeberos. See P. Z. S. 1873, p. 282.
235. Tyrannus melancholicus (Vieill.) ; d'Orb. \& Lafr. Syn. Av. i. p. 44 ; d'Orb. Voy. Ois. p. 311, t. li. f. 33 (egg).

Provinces of Santa Cruz de la Sierra, Chiquitos, Moxos (O.); Cangalli, Tilotilo, Prov. Yungas (B.).
236. Milvulus tyrannus (Limn.).

Tyrannus savana, d'Orb. \& Lafr. Syn. Av. i. p. 44.
Tyrannus tyrannus, d'Orb. Voy. Ois. p. 310, t. xliv. f. 2.
Santa Cruz, Provinces of Moxos and Chiquitos (O.).

## Fam. Cotingides.

237. Pipra fasclata, d'Orb. \& Lafr. Syn. Av. i. p. 38 ; d'Orb. Voy. Ois. p. 295, t. xxx. f. 1.

Environs of Santa Cruz de la Sierra, and Territory of the Guarayos Indians (O.).
238. Pipra chloromeros (Tsch.).

Pipra rubrocapilla, d'Orb. \& Lafr. Syn. Av. i. p. 38 ; d'Orb. Voy. Ois. p. 294.

Pipra chloromeros, Scl. Cat. Am. B. p. 248.
Baganti, Prov. Yungas (B.); Territory of the Yuracares Indians (0.).
239. Ceiroxiphia pareola (Linn.).

Nairapi, Tilotilo, Prov. Yungas (B.).
Bolivian agree with Brazilian skins, except in having the crest rather narrower and of a somewhat darker colour.
240. Metopia galeata (Licht.); Scl. Cat. Am. B. p. 252.

Simacu, Prov. Yungas (B.).
241. Tityra cayana (Linn.).

Psaris cayanus, d'Orb. \& Lafr. Syn. Av. i. p. 41 ; d’Orb. Voy. p. 301 .

Santa Cruz de la Sierra, Chiquitos, Moxos (O.).
242. Tityra semifasciata (d'Orb. \& Lafr.).

Psaris semifasciata, d’Orb. \& Lafr. Syn. Av. i. p. 41 ; d'Orb. Voy. Ois. p. 301.

Tityra semifasciata, Scl. Cat. Am. B. p. 238.
Environs of Santa Cruz de la Sierra and Santo Corazon (O.) ; Simacu, Prov. Yungas (B.).
243. Tityra inquisitrix (Vieill.).

Psaris inquisitor, d'Orb. \& Lafr. Syn. Av. i. p. 41 ; d'Orb. Voy. Ois. p. 302.

Tityra inquisitrix, Scl. P. Z. S. 1857, p. 71.
Provinces of Santa Cruz de la Sierra and Chiquitos (O.).
244. Hadrostomus minor (Less.).

Psaris roseicollis, d'Orb. \& Lafr. Syn. Av. i. p. 42 ; d'Orb. Voy. Ois. p. 302.

Hadrostomus minor, Scl. Cat. Am. B. p. 240.
Territory of the Yuracares and Guarayos Indians, Prov. Chiquitos (O.).
245. Pachyrhamphus atricapillus (Gm.).

Pachyrhynchus marginatus, d'Orb. \& Lafr. Syn. Av. i. p. 42;
d'Orb. Voy. Ois. p. 303, t. xxxi. f. 2, 3, 4 .
Pachyrhamphus atricapillus, Scl. \& Salv. Nomencl. p. 56.
Territory of the Yuracares Indians ( $O$.).
246. Lathria uropygialis, Scl. \& Salv. P. Z. S. 1876, p. 355.

Tilotilo, Prov. Yungas (B.).
247. Lathria plumbea (Licht.).

Querula cinerea, d'Orb. \& Lafr. Syn. Av. i. p. 39.
Querula cineracea, d'Orb. Voy. Ois. p. 296.
Mission de Magdalena, Prov. Moxos (O.); Guanai, Prov. Yungas (B.).
248. Casiornis rubra (Vieill.).

Tyrannus rufus, d'Orb. \& Lafr. Syn. Av. i. p. 44; d'Orb. Voy. Ois. p. 308.

Casiornis rubra, Scl. \& Salv. Nomencl. p. 57.
Provinces of Yungas and Chiquitos ( $O$.).
The specimens of d'Orbigny marked Tyrannus rufus in the Paris Museum belong to this species.
249. Rupicola peruviana, Lath.; d’Orb. \& Lafr. Syn. Av. i. p. 38 ; d'Orb. Voy. Ois. p. 294.

Rupicola saturata, Cab. \& Hein. Mus. Hein. ii. p. 99.
Provinces of Yungas, and forests east of Cochabamba (O.); Simacu, Tilotilo, Prov. Yungas (B.).

Bolivian skins are intermediate in tint between $R$. peruviana and R. sanguinolenta.
250. Pipreola viridis (d’Orb. \& Lafr.).

Ampelis viridis, d'Orb. \& Lafr. Syn. Av. i. p. 40 ; d'Orb. Voy. Ois. p. 298, t. xxx. f. 2.

Pipreola viridis, Scl. Ibis, 1878, p. 167.
Chulumani, Prov. Yungas (O.); Tilotilo, Prov. Yungas (B.).
251. Pifreola frontalis (Scl.); Scl. Ibis, 1878, p. 169, pl. vi.

Titotilo, Prov. Yungas ( B. $^{\text {. }}$.
252. Ampelis arcuata (Lafr.); Scl. Cat. A. B. p. 255.

Tilotilo, Prov. Yungas (B.).
253. Heliochera rubrocristata (d’Orb. \& Lafr.).

Ampelis rubrocristata, d'Orb. \& Lafr. Syn. Av. i. p. 39; d'Orb. Voy. Ois. p. 297, t. xxxi. f. 1.

Heliochera rubrocristata, Scl. Cat. Am. B. p. 255.
Provinces of Yungas and Ayupaya (O.).
254. Cotinga cayana (Lim.).

Ampetis cayana, d’Orb. \& Lafr. Syn. Av. i. p. 40.
Ampelis cayennensis, d'Orb. Voy. Ois. p. 297.
Cotinga cayana, Scl. Cat. Am. B. p. 256.
Territory of the Yuracares Indians ( $O$.).
255. Cephalopterus ornatus, Geoffr.; d'Orb. \& Lafr. Syn. Av. i. p. 39 ; d'Orb. Voy. Ois. p. 296.

Tilotilo, Pror. Yungas (B.); Apolobamba (0.).

Fam. Рнутотомide.
256. Phytotoma angustirostris, d'Orb. \& Lafr. Syn. Av.i. p. 37 ; d'Orb. Voy. Ois. p. 292, t. xxix. f. 2 ; Scl. Cat. Am. B. p. 260 .

Valley of La Paz and environs of Cavari, Inquisivi, Prov. Sicasica, Palta, Prov. Ayupaya, Provinces of Cochabamba, Mizqué, and Chuquisaca (O.) ; Tilotilo, Prov. Yungas (B.).

## Fam. Dendrocolaptide.

257. Geositta cunicularia (Vieill.).

Certhilauda cunicularia, d'Orb. \& Lafr. Syn. Av. i. p. 71 ; d'Orb. Voy. Ois. p. 358, t. xliii. f. 1.

Geositta cunicularia, Scl. Cat. Am. B. p. 146.
La Paz, Cochabamba, and summit of the Cordillera (O.).
258. Geositta tenuirostris (d’Orb. \& Lafr.).

Certhilauda tenuirostris, d'Orb. \& Lafr. Syn. Av. i. p. 72; d'Orb. Voy. Ois. p. 359, t. xliii. f. 2.

Geositta tenuirostris, Scl. \& Salv. P. Z. S. 1869, p. 153.
Cavari, Prov. Sicasica, Cochabamba (O.).
259. Furnarius commersoni, Pelzeln, Orn. Bras. p. 34.

Tilotilo, Prov. Yungas (B.).
260. Upucerthia ruficauda (Meyen).

Upucerthia montana, d'Orb. \& Lafr. Syn. Av. ii. p. 22 ; d'Orb. Voy. Ois. p. 371, t. lvi. f. 1.

Ochetorhynchus ruficauda, Scl. Cat. Am. B. p. 148.
Environs of La Paz (O.).
261. Cinclodes nigrifumosus (d’Orb. \& Lafr.).

Upucerthia nigrifumosa, d'Orb. \& Lafr. Syn. Av. ii. p. 22 ; d'Orb. Voy. Ois. p. 372, t. lvii. f. 2.

Cobija (O.) ; Tilotilo, Prov. Yungas (B.).
262. Cinclodes patagonicus (Gm.).

Upucerthia rupestris, d'Orb. \& Lafr. Syn. Av. ii. p. 21.
Cinclodes patagonicus, Scl. Cat. Am. B. p. 148.
Cobija ( 0 .).
263. Cinclodes fuscus (Vieill.).

Upucerthia vulgaris, d'Orb. \& Lafr. Syn. Av. ii. p. 22; d'Orb. Voy. Ois. p. 372, t. lvii. f. 1.

Cinclodes fuscus, Scl. \& Salv. P. Z. S. 1870, p. 786.
Potosi, Oruro, La Paz, and Chuquisaca (O.) ; Sorata, Tilotilo, Prov. Yungas (B.).
264. Lochmias obscurata, Cab. J. f. O. 1873, p. 65.
L. sororia, Scl. \& Salv. P. Z. S. 1873, p. 511.

Baganti, Prov. Yungas (B.).
265. Leptasthenura efgithaloides (Kittl.).

Synallaxis agythaloides, d'Orb. \& Lafr. Syn. Av. i. p. 23; d’Orb. Voy. Ois. p. 243.

Cobija, and environs of La Paz ( $O$.).
266. Leptasthenura fuliginiceps (d’Orb. \& Lafr.).

Synallaxis fuliginiceps, d'Orb. \& Lafr. Syn. Av. i. p. 23 ; d'Orb. Voy. Ois. p. 242, t. xvii. f. 1.

Inquisivi, Prov. Sicasica, Valle Grande (O.) ; Tilotilo, Prov. Yungas (B.).
267. Synallaxis frontalis, Pelz.

Synallaxis ruficapilla, d'Orb. \& Lafr. Syn. Av. i. p. 24 ; d'Orb. Voy. Ois. p. 246.

Synallaxis frontalis, Scl. P. Z. S. 1874, p. 7.
Carcuata, Prov. Yungas, Inquisivi, Prov. Sicasica, Chaluani, Prov. Mizqué, Prov. Moxos (O.) ; Ramosani, Prov. Yungas (B).
268. Synallaxis semicinerea (Reichenbach).

Synallaxis semicinerea, Scl. P. Z.S. 1874, p. 12.
Valle Grande ( $0 .$, Mus. Paris).
269. Synallaxis torquata, Max.

Synallaxis bitorquata, d’Orb. \& Lafr. Syn. Av. i. p. 24.
S. torquata, d'Orb. Voy. Ois. p. 248, t. xv. f. 2 ; Scl. P. Z. S. 1874, p. 17.

Mission de la Concepcion, Prov. Chiquitos (O.).
270. Synallaxis maximiliani, d'Orb.

Synallaxis torquata, d'Orb. Syn. Ar. i. p. 25.
Synallaxis maximiliani, d'Orb. Voy. Ois. p. 247, t. xv. f. 1; Scl. P. Z.S. 1874, p. 17.

Carcuata, Prov, Yungas (0.).
271. Synallaxis hyposticta, Pelzeln; Scl. P. Z. S. 1874, p. 20.

Territory of the Yuracares Indians ( $0 .$, Mus. Paris).
272. Synallaxis rufipennis, sp. nov.

Synallaxis striaticeps, d'Orb. \& Lafr. Syn. Av. i. p. 22; d'Orb. Voy. Ois. p. 241, t. xvi. f. 1 (partim).

Supra murino-cinerea; pileo fulvo, nigro striato; superciliis albis; tectricibus alarum et secundariis extus cum cauda tota rufs; subtus alba, hypochondriis et crisso fusco lavatis; rostro nigricante, mandibula inferiore ad basin carnea; pedibus fuscis. Long tota $5 \cdot 5$, alae $2 \cdot 6$, cauda $3 \cdot 0$.
Hab. Bolivia, Tilotilo (Buckley).
Obs. Species formâ et habitu S. striaticipitis, sed pileo toto conspicuè striato et secundariis extùs rufis distinguenda.

This species was probably confounded by d'Orbigny with S. striaticeps, as he mentions the latter as occurring in Bolivia. It should be placed next to $S$. striaticeps in the arrangement of the genus as given by Sclater (P. Z. S. 1874, p. 21).
273. Synallaxis albiceps, d’Orb. \& Lafr. Syn. Av. i. p. 23 ; d'Orb. Voy. Ois. p. 241, t. xvi. f. 2; Scl. P. Z. S. 1874, p. 21. Capiñata, Prov. Sicasica (O.); Tilotilo, Prov. Yungas (B.).
274. Synallayis orbignii, Reichenbach.

Synallaxis humicola, d'Orb. \& Lafr. Syn. Av. i. p. 24 ; d'Orb. Voy. Ois. p. 245, t. xvii. f. 2 (nec Kittl.) ; Scl. Cat. Am. B. p. 153.

Synallaxis orbignii, Scl. P. Z.S. 1874, p. 22, et P. Z.S. 1879, p. 461 .

Synallaxis fugax, Doering, MS., Scl. P. Z. S. 1879, p. 461.
Valley of La Paz, Cochabamba, environs of Palca, Prov. Ayupaya (O.).
275. Hacelodomus sibilator.

Anabates ruffrons, d'Orb. \& Lafr. Syn. Av. ii. p. 19.
Anumbius frontalis, d'Orb. Voy. Ois. p. 256.
Placellodomus frontalis, Scl. Cat. Am. B. p. 154 (partim).
"P. sibilatrix, Döring ;" Scl. anteà, p. 461.
Prov. Sicasica (0.).
276. Placellodomus ruber (Vieill.).

Anabates ruber, d'Orb. \& Lafr. Syn. Ar. ii. p. 14.
Anumbius ruber, d'Orb. Voy. Ois. p. 253.
Prov. Chiquitos (O.).
277. Pseudocolaptes boissoneauti (Lafr.); Scl. Cat. Am.
B. p. 156.

Tilotilo, Prov. Yungas (B.).
278. Homorus unirufus (d'Orb. \& Lafr.).

Anabates unirufus, d'Orb. \& Lafr. Syn. Av. ii. p. 16; d'Orb.
Voy. Ois. p. 370, t. lv. f. 1.
Homorus unirufus, Scl. Cat. Am. B. App. p. 360.
Prov. Moxos (O.).
279. Automolus striaticeps, Scl. \& Salv. P. Z. S. 1875, p. 37;

Tacz. P. Z. S. 1874, p. 528.
Guanai, Tilotilo, Prov. Yungas (B.).
280. Philydor ruficaudatus (d'Orb. \& Lafr.).

Anabates ruficaudatus, d'Orb. \& Lafr. Syn. Av. ii. p. 15.
Territory of the Yuracares Indians (O.).
281. Anabazenops rufosuperciliatus (d'Orb. \& Lafr.). Xenops rufosuperciliatus, d'Orb. \& Lafr. Syn. Av. ii. p. 13. Prov. Yungas (O.).
282. Anabazenops temporalis, Sel. P. Z.S. 1859, p. 141.

Tilotilo, Prov. Yungas (B.).
283. Sittasomus erithacus (Licht.).

Dendrocolaptes sylviellus, d'Orb. \& Lafr. Syn. Av. ii. p. 13.
Sittasomus erithacus, Scl. \& Salv. P.Z. S. 1868, p. 630.
Pror. Chiquitos (O.).
284. Margarornis squamigera (d'Orb. \& Lafr.).

Anabates squamiger, d'Orb. \& Lafr. Syn. Av. ii. p. 14; d'Orb. Voy. Ois. p. 369, t. liv. f. 2.

Margarornis squamiger, Salv. Ibis, 1874, p. 322.
Palca, Prov. Ayupaya ( $O$.) ; Tilotilo, Pror. Yungas (B.).
285. Dendrocolaptes certhia (Bodd.).

Picus certhia, Bodd. Tabl. d. Pl. Enl. p. 38.
Dendrocolaptes cayennensis, d'Orb. \& Lafr. Syn. Av. ii. p. 11 ; Scl. Cat. Am. B. p. 162.

Prov. Chiquitos ( $O$.).
286. Dendrocincla atrirostris (d'Orb. \& Lafr.).

Dendrocolaptes atrirostris, d'Orb. \& Lafr. Syn. Av. ii. p. 12.
Territory of the Guarayos Indians ( $\boldsymbol{O}$.).
287. Хiphocolaptes promeropirhynchus (Less.) ; Scl. Cat. p. 163.

Dendrocolaptes albicollis, d'Orb. \& Lafr. Syn. ii. p. 10 (?)
Tilotilo, Prov. Yungas (B.).
Mr. Buckley's skins seem hardly separable from this species; but Lafresnaye refers d'Orbigny's Bolivian examples to his $X$. simpliceps (Rev. Zool. 1850, p. 100).
288. Xiphocolaptes major (Vieill.).

Dendrocolaptes major, d'Orb. \& Lafr. Syn. Av. ii. p. 11.
Xiphocolaptes major, Scl. Cat. Am. B. p. 164.
Prov. Chiquitos ( $O$.).
289. Dendrornis guttata (Licht.).

Dendrocolaptes guttatus, d'Orb. \& Lafr. Syn. Av. ii. p. 11. Territory of the Guarayos Indians ( $O$.); Guanai, Prov. Yungas (B.).
290. Dendrornis pardalotus (Vieill.); Scl. Cat.Am.B. p. 164.

Nairapi, Prov. Yungas (B.).
291. Dendrornistriangularis (Lafr.); Scl. Cat.Am. B. p. 165.

Simacu, Prov. Yungas (B.).
292. Picolaptes bivittatus (d’Orb. \& Lafr.).

Dendrocolaptes bivittatus, d’Orb. \& Lafr. Syn. Av. ii. p. 12.
Picolaptes bivittatus, Scl. Cat. Am. B. p. 167.
Prov. Chiquitos ( $O$. ).
293. Xiphorhynchus lafresnayanus, d'Orb.

Dendrocolaptes procurvus, d'Orb. \& Lafr. Syn. Av. ii. p. 12.
D. lafresnayanus, d'Orb. Voy. Ois. p. 368, t. liii. f. 2.

Xiphorhynchus lafresnayanus, Scl. Cat. Am. B. p. 168.
Prov. Chiquitos (O.).
We are very doubtful whether the Bolivian form thus designated by d'Orbigny is really distinct from $X$. trochilirostris.

## Fam. Formicariide.

294. Thamnophilus major, d'Orb. \& Lafr.

Thamnophilus major, d’Orb. \& Lafr. Syn. Av. i. p. 10; d'Orb. Voy. Ois. p. 166 ; Scl. P. Z. S. 1858, p. 208, Cat. Am. B. p. 172.

Provinces of Yungas, Cochabamba, and Santa Cruz de la Sierra (O.).
295. Thamnophilus nevius (Gm.); d’Orb. \& Lafr. Syn. Av. i. p. 10 ; d'Orb. Voy. Ois. p. 170.

Missions de San Miguel, La Concepcion, and Santa Ana, Prov. Chiquitos (O.).
296. Thamnophilus aspersiventris, d'Orb. \& Lafr. Syn. Av. i. p. 11 ; d'Orb. Voy. Ois. p. 171, t. iv.

Provinces of Yungas, Sicasica, and Ayupaya (O.); Simacu, Tilotilo, Prov. Yungas (B.).
297. Thamnophilus noliatus (Linn.) ; d’Orb. \& Lafr. Syn. Av. i. p. 10; d'Orb. Voy. Ois. p. 168.

Chulumani and Irupana, Prov. Yungas, Provinces of Santa Cruz de la Sierra, Chiquitos, and Moxos (O.).
298. Thamnophilus palliatus, Licht.; d’Orb. \& Lafr. Syn. Av. i. p. 11 ; d'Orb. Voy. Ois. p. 174.

Prov. Chiquitos (O.) ; Consata, Tilotilo, Prov. Yungas (B.).
299. Thamnophilus torquatus, d'Orb. \& Lafr.

Thamnophilus atropileus, d'Orb. \& Lafr. Syn. Av. i. p. 11; d'Orb. Voy. Ois. p. 173.

Thamnophilus torquatus, Scl. P. Z.S. 1858, p. 220.
Territory of the Guarayos Indians ( $O$.).
300. Thamnophilus subfasciatus, Scl. \& Salv. P. Z. S. 1876, p. 357 .

Tilotilo, Prov. Yungas (B.).
301. Dysithamnus guttulatus (Licht.).

Thamnophilus striatothorax, d’Orb. \& Lafr. Syn. Av. i. p. 12; d'Orb. Voy. Ois. p. 176.
Dysithamnus guttulatus, Scl. P. Z. S. 1858, p. 221.
Territory of the Yuracares Indians ( 0 .).
302. Dysithaminus mentalis (d'Orb. et Lafr.).

Thamnophilus mentalis, d'Orb. \& Lafr. Syn. Av. i. p. 12; d'Orb. Voy. Ois. p. 177.
Dysithamnus mentalis, Scl. Cat. Am. B. p. 177.
Prov. Yungas ( 0. .).
303. Dysithamnus schistaceus (d’Orb.).

Thamnophilus fuliginosus, d'Orb. \& Lafr. Syn. Av. i. p. 10.
Thamnophilus schistaceus, d'Orb. Voy. Ois. p. 170, t. v. f. 1.
Territory of the Yuracares Indians ( $O$. .).
304. Thamnomanes cesius (Licht.).

Tyrannus casius, d'Orb. Voy. Ois. p. 309.
Thamnomanes casius, Scl. Cat. Am. B. p. $1 / 8$.
Territory of the Yuracares Indians ( $O$.).
305. Herpsilochomus pileatus (Licht.).

Thamnophilus pileatus, d'Orb. \& Lafr. Syn. Av. i. p. 12 ; d'Orb. Voy. Ois. p. 175; Scl. P. Z. S.

Herpsilochomus pileatus, Scl. P. Z. S. 1858, p. 233.
Mission de San José, Prov. Chiquitos ( $O$.).
306. Myrmotherula pygmea (Gm.).

Thamnophilus minutus, d’Orb. \& Lafr. Syn. Av. i. p. 12.
Myrmotherula pygmঞea, Scl. P. Z.S. 1858, p. 234.
Territory of the Yuracares Indians (O.).
307. Myrmotherula axillaris (Vieill.).

Thamnophilus axillaris, d'Orb. \& Lafr. Syn. Av. i. p. 12.
Tamnophilus axillaris, d'Orb. Voy. Ois. p. 183.
Cochabamba, and Territory of the Yuracares Indians (O.).
308. Myrmotherula menetriési (d’Orb.).

Myrmothera ménétriési, d'Orb. Voy. Ois. p. 184.
Cochabamba, and Territory of the Yuracares Indians (O.).
309. Formicivora rufatra (d'Orb. \& Lafr.).

Thumnophilus rufater, d'Orb. \& Lafr. Syn. Av. i. p. 12; d'Orb. Voy. Ois. p. 180.

Provinces of Chiquitos and Moxos (O.).
310. Pyriglena leucoptera (Vieill.).

Thamnophilus domicella, d’Orb. \& Lafr. Syn. Av. i. p. 11.
Formicivora domicella, d'Orb. Voy. Ois. p. 178.
Pyriglena leucoptera, Scl. P. Z. S. 1858, p. 246.
Mission de Santa Ana, Prov. Chiquitos (O.).
311. Pyriglena atra (Sw.).

Thamnophilus aterrimus, d'Orb. \& Lafr. Syn. Av. i. p. 12.
Formicivora atra, d'Orb. Voy. Ois. p. 179.
Pyriglena atra, Scl. P. Z. S. 1858, p. 246.
Rio de Chairo, Prov. Yungas, and Prov. Chiquitos (O.).
312. Myrmeciza hemimelena, Scl.

Thamnophilus guttatus, d'Orb. \& Lafr. Syn. Av. i. p. 13; d'Orb. Voy. Ois. p. 177 (nec Vieill.).

Myrmeciza hemimelæna, Scl. P. Z. S. 1857, p. 48, et 1858, p. 249.
Territory of the Yuracares Indians (O.).
313. Hypocnemis navia (Gm.).

Conopophaga n®via, d'Orb. \& Lafr. Syn. Av. i. p. 13; d'Orb. Voy. Ois. p. 186.

Territory of the Yuracares Indians ( 0 .).
314. Phlogopsis nigro-maculata (d’Orb. \& Lafr.).

Myothera nigro-maculata, d'Orb.\& Lafr. Syn. Av. i. p. 14; d'Orb. Voy. Ois. p. 190, t. vi*. f. 2.

Phlogopsis nigro-maculata, Scl. P. Z.S. 1858, p. 276.
Territory of the Guarayos Indians ( $\mathbf{O}$.).
315. Formicarius analis (d'Orb. \& Lafr.).

Myothera analis, d'Orb. \& Lafr. Syn. Av. i. p. 14 ; d’Orb. Voy. Ois. p. 191, t. vi. f. 1.

Formicarius analis, Salvin, P. Z.S. 1866, p. 74.
Between Santa Cruz de la Sierra and Chiquitos (O.).
316. Chameza olivacea, Tsch.; Scl. P.Z.S. 1858, p. 279.

Tilotilo, Prov. Yungas (B.).
317. Grallaria squamigera, Prevost; Scl. Ibis, 1877, p. 439.

Tilotilo, Prov. Yungas (B.).
318. Grallaria erythrotis, Scl. \& Salv. P. Z. S. 1876, p. 357.

Tilotilo, Prov. Yungas (B.).
319. Conopophaga ardesiaca, d'Orb. \& Lafr. Syn. Av. i. p. 13 ; d'Orb. Voy. Ois. p. 181 ; Scl. Cat. Am. B. p. 193.

Rio Meguilla, Carcuata, Prov. Yungas (0.); Tilotilo, Prov. Yungas ( $B$.).

Proc. Zool. Soc.-1879, No. XL.
320. Corythofis nigro-cincta (d'Orb. et Lafr.).

Conopophaga nigro-cincta, d’Orb. \& Lafr. Syn. Av. i. p. 13 ; d'Orb. Voy. Ois. p. 187, t. vi. f. 2.

Mission de Santa Ana, Prov. Chiquitos (0.).
Fam. Pteroptochide.
321. Scytalopus syluestris, 'Tacz. P. Z. S. 1874, p. 138.

Yuyo, Prov. Yungas (B).
Fam. Cypselide.
322. Cypselus andicola, d'Orb. \& Lafr. Syn. Av. i. p. 70; d'Orb. Voy. Ois. p. 358.

Consata, Prov. Yungas (B.) ; La Paz, Cavari, and Inquisivi (O). 323. Hemiprocne zonaris (Shaí).

Chatura zonaris, Scl. P. Z. S. 1865, p. 609.
Consata (B.).
Fam. Caprimulgide.
324. Podager nacunda (Vieill.).

Caprimulgus nacunda, d'Orb. \& Lafr. Syn. Av. i. p. 67.
Santa Cruz de la Sierra, and Chiquitos (O.).
325. Chordeiles rupestris (Spix).

Caprimulgus rupestris, d'Orb. \& Lafr. Syn. Av. i. p. 68.
Prov. Moxos (0.).
326. Stenopsis equicaudata (Peale).

Antrostomus rquicaudatus, Scl. P. Z. S. 1867, p. 342.
Tilotilo, Prov. Yungas (B.).
327. Hydropsalis trifurcata, Scl. P. Z. S. 1866, p. 141.

Yuyo, Prov. Yungas (B.).
328. Hydropsalis segmentata, Cassin.

Tilotilo, Prov. Yungas (B.).
329. Nyctidromus albicollis (Gm.).

Caprimulyus albicollis, d'Orb. \& Lafr. Syn. Av. i. p. 67.
Nyctidromus albicollis, Scl. P. Z. S. 1866, p. 144.
Prov. Chiquitos (O.).

## Fam. Trochilide.

330. Phaethornis superciliosus (Linn.).

Trochilus superciliosus, d'Orb. \& Lafr. Syn. Av. ii. p. 31. Phaethornis malaris, Gould, Mon. Troch. i. pl. xvii.
Tilotilo (B.) ; Yungas, Guarayos (O.).
331. Phaethornis philippit (Bourc.) ; Gould, Mon. Troch. i. pl. xxi.

Bolivia (teste Bourcier).
332. Pygmornis pygmeus (Spix); Gould, Mon. Troch.i. pl.lvi.

Trochilus brasiliensis, d'Orb. \& Lafr. Syn. Av. ii. p. 32.
Pygmornis pygmaus, Elliot, Ibis, 1877, p. 141.
Yuracares, Guarayos (O.); Guanai (B.).
333. Tifrenetes leucurus (Linn.)

Trochilus leucurus, d'Orb. \& Lafr. Syn. Av. ii. p. 32.
Threnetes leucurus, Elliot, Ibis, 1877, p. 142.
Yuracares (O.).
334. Campylopterus equatorialis, Gould, Intr. to Troch. p. 54.

Mapiri (B.).
335. Aphantochroa hyposticta, Gould, P. Z. S. 1862, p. 124.

Nairapi (B.).
336. Oreotrochilus estella (d'Orb. et Lafr.).

Trochilus estella, d'Orb. \& Lafr. Syn. Av. ii. p. 32; d'Orb. Voy. Ois. p. 376, pl. kxi. fig. 1 .

Oreotrochilus estella, Gould, Mon. Troch. ii. pl. lxx.
La Paz, Potosi (O.) ; Cachira (B.).
337. Oreotrochilus adela (d'Orb. et Lafr.).

Trochilus adela, d'Orb. \& Lafr. Syn. Av. ii. p. 33; d'Orb. Voy. Ois. p. 377, t. lxi. fig. 2.

Oreotrochilus adela, Gould, Mon. Troch. ii. pl. Ixxiii.
Mizqui and Cachira (B.) ; Chuquisaca (O.).
338. Lampornis violicauda (Bodd.).

Trochilus mango, d'Orb. \& Lafr. Syn. Av. ii. p. 32.
Lampornis violicauda, Elliot, Ibis, 1877, p. 141.
Mojos, Guarayos (O.).
339. Hemistephania ludovicie (Bourc.); Gould, Mon. Troch. ii. pl. lxxxviii.

Tilotilo (B.).
340. Heliodoxa leadbeateri (Bourc.).
H. otero, Gould, Mon. Troch. ii. pl. xcvi.

Near La Paz (Bridges, teste Gould) ; Tilotilo (B.).
341. Thalurania nigrofasciata (Gould) ; Elliot, Ibis, 1877, p. 335.

Ornismya furcata, d'Orb. \& Lafr. Syn. Av. ii. p. 27.
Chiquitos, Santa Cruz, Moxos (O.); Consata, Nairapi, Apollo (B.).
342. Lophornis regulus, Gould, Mon. Troch. iii. pl. cex. Tilotilo (B.).
343. Acestrura mulsanti (Bourc.) ; Gould, Mon. iii. pl. celv.

Orn. cyanopogon, d’Orb. \& Lafr. Syn. Av. ii. p. 28.
Acestrura mulsanti, Elliot, Ibis, 1877, p. 136.
Yungas (O.) ; Tilotilo (B.).
344. Steganura adde (Bourc.).

Spathura rufocaligata, Gould, Mon. Troch. iii. pl. clxv.
Sandillani, Yungas (Bridges, teste Gould) ; Bellavista, Tilotilo (B.).
345. Lesbia nuna (Less.); Gould, Mon. Troch. iii. pl. clix.

Orn. gouldii, d'Orb. \& Lafr. Syn. Av. ii. p. 17.
Enquisivi (O.); Sorata, Consata (B.).
346. Cynanthus mocoa (Delattre et Bourc.); Gould, Mon. Troch. iii. pl. clxxiii.

Quilabaya and Tilotilo (B.).
347. Sappho sparganura (Shaw).

Cometes sparganurus, Gould, Mon. Troch. iii. pl. clxxiv.
Orthorhynchus chrysurus, d'Orb. \& Lafr. Syn. Av. ii. p. 26.
Chuquisaca (Bonelli, teste Gould); Yungas (0.).
348. Sappho phaon (Gould) ; Gould, Mon. Troch. iii. pl. clexp.

Ornismya chrysurus, d'Orb. \& Lafr. Syn. Av. ii. p. 27.
La Paz, Sicasica ( 0. ); Sapahaque, La Paz (B.).
349. Agleactis pamela (d'Orb. et Lafr.).

Agleactis pamela, Gould, Mon. Troch. iii. pl. clxxxi.
Orn. pamela, d'Orb. \& Lafr. Syn. Av. ii. p. 28.
Orthorhynchus pamela, d'Orb. Voy. Ois. p. 375, pl. lx. fig. 1.
Consata, Cillutincara, and Unduavi (B.) ; Tagesi, La Paz and Palca Grande, Ayupaya (O.).
350. Rhamphomicron olivaceum, Lawr. Ann. L. N. Y. viii. p. 45 (1847).

Bolivia (Lawrence).
351. Rhamphomicron ruficeps (Gould); Gould, Mon. Troch. iii. pl. clsxxviii.

Tilotilo (B.).
352. Metallura eneiçauda (Gould); Gould, Mon. Troch. iii. pl. cxcii.

Cillutincara (B.); Yungas (Bridges, teste Gould).
353. Metallura smaragdinicollis (d’Orb. et Lafr.).

Ornismya smaragdinicollis, d'Orb. \& Lafr. Syn. Av. ii. p. 31.
Orthorhynchus smaragdinicollis, d'Orb. Voy. Ois. p. 375, pl. lix. fig. 2.

Metallura smaragdinicollis, Gould, Mon. Troch. iii. pl. excvi.
Tilotilo (B.) ; Cagapi near Yanacaché, Yungas and Palca, Ayupaya (O.).
354. Adelomyia inornata (Gould); Gould, Mon. Troch. iii. pl. excrii.

Tilotilo (B.).
355. Petasophora serrirostris (Vieill.).

Ornismya petasophora, d'Orb. \& Lafr. Syn. Av. ii. p. 28.
Petasophora serrirostris, Elliot, Ibis, 1877, p. 137.
Valle Grande (O.).
356. Petasophora anais (Less.) ; Gould, Mon. Troch. iv. pl. cexxiv.

Tilotilo (B.).
357. Petasophora cyanotis (Bourc.); Gould, Mon. Troch. iv. pl. cexxviii.

Tilotilo (B.).
358. Carysobronchus virescens (Dumont); Gould, Mon. Troch. iv. pl. cexxx.

Trochilus viridis, d'Orb. \& Lafr. Syn. Av. ii. p. 32.
Polytmus virescens, Elliot, Ibis, 1877, p. 142.
Mojos (O.).
359. Patagona gigas(Vieill.); Gould, Mon. Troch. iv.pl. cexxxii.

Ornismya gigantea, d'Orb. \& Lafr. Syn. Av. ii. p. 26.
Patagona gigus, Elliot, Ibis, 1877, p. 134.
Cochabamba, La Paz, Chuquisaca (0.); La Paz and Chuquisaca (Bonelli, teste Gould).
360. Helianthea violifera (Gould); Gould, Mon. Troch, iv. pl. cexxxix.

Consata, Tilotilo (B.).
361. Heliangelus amethysticollis (d’Orb. et Lafr.).

Orn. amethysticollis, d'Orb. \& Lafr. Syn. Av. ii. p. 31.
Orthorhynchus amethysticollis, d'Orb. Voy. Ois. p. 376, pl. lx. fig. 12.

Tilotilo (B.) ; Yuracares (O.).
362. Diphlogena iris (Gould) ; Gould, Mon. Troch. iv. pl. cexlvii.

Eastern slopes of Andes of Illimani and Sorata (Warszewiez).
363. Diphlogena aurora (Gould); Gould, Mon. Troch. iv. pl. cexlviii.

Eastern slopes of Andes of Illimani and Sorata (Warszewiez).
364. Bourcieria inca, Gould; Gould, Mon. Troch. iv. pl. celiv.

Coroico (Warszewiez) ; Tilotilo (B.).
365. Lampropygia boliviana, Gould; Gould, Introduction to 'Troch. p. 137; Elliot, Ibis, 1876, p. 57.

Tilotilo (B.).
366. Eriocnemis aurelie (Bourc.); Gould, Mon. Troch. iv. pl. celxxxiii.

Apollo, Tilotilo (B.).
These specimens differ slightly from the true $E$. aurelice in having the downy feathers of the tarsi pale brown instead of brown and white.
367. Eriocnemis glaucopoides (d'Orb. et Lafr.).

Ornismya glaucopoides, d'Orb. \& Lafr. Syn. Av. ii. p. 27.
Eriocnemis glaucopoides, Elliot, Ibis, 1877, p. 136.
Valle Grande (O.).
368. Leucippus chionogaster (Tsch.) ; Gould, Introduction to Troch. p. 178.

Sorata, Tipuani, Tilotilo (B.).
369. Leucochloris albicollis (Vieill.).

Ornismya albicollis, d'Orb. \& Lafr. Syn. Av. ii. p. 30.
Leucochloris albicollis, Elliot, Ibis, 1877, p. 30.
Yungas (O.).
370. Thaumasius albiventris (Less.).

Ornismya albiventris, d'Orb. \& Lafr. Syn. Av. ii. p. 30.
Thaumantias albiventris, Elliot, Ibis, 1877, p. 138.
Mojos (O.).
371. Thaumasius neglectus, Elliot.

Ornismya bicolor, d'Orb. \& Lafr. Syn. Av. ii. p. 30.
Thaumantias neglectus, Elliot, Ibis, 1877, p. 30.
Yungas, Moxos (O.).
372. Chrysuronia josephine (Bourc. et Muls.) ; Gould, Mon. Troch. v. pl. cecxavi.

Consata, Tilotilo (B.).
373. Chrysuronia chrysura (Less.).

Ornismya ruficollis, d'Orb. \& Lafr. Syn. Av. ii. p. 30.
Chrysuronia chrysura, Elliot, Ibis, 1877, p. 140.
Santa Cruz, Chiquitos (O.).
374. Hylocharis cyanea (Vieill.).

Ornismya cyanea; d'Orb. \& Lafr. Syn. Av. ii. p. 30.
Hylocharis cyanea, Elliot, Ibis, 1877, p. 138.
Guarayos (O.).
375. Chlorostilbon splendidus (Vieill.).

Ornismya aureiventris, d'Orb. \& Lafr. Syn. Av. ii. p. 28.
Chlorostilbon splendidus, Elliot, Ibis, 1877, p. 136.
Moxos, Cochabamba (O.) ; Mizque (B.).
376. Chlorostilbon prasinus (Less.).

Ornismya mellisuga, d'Orb. \& Lafr. Syn. Av. ii. p. 30. Chlorostilbon prasinus, Elliot, Ibis, 1877, p. 139.
Yungas, Sicasica, Ayupaya (O.).

## Family Picide.

377. Picumnus albosquamatus, d'Orb. Voy. Ois. p. 380, t. lxiv. f. 2.

Rio de Tamanipaya, Prov, Yungas (0.) ; Tilotilo, Prov. Yungas (B.).
378. Campephilus trachelopyrus (Malh.) ; Scl. Cat.Am. B. p. 332.

Apollo, Tilotilo (B.).
379. Campephilús boiet (Wagler).

Picus atriventris, d'Orb. Voy. Ois. p. 378, t. lxiii. f. 1.
Phlooceastes boiei, Cab. et Heine, Mus. Hein. iv. p. 97.
Provinces of Chiquitos and Valle Grande ( 0. ).
380. Picus lignarius, Mol.

Picus puncticeps, d'Orb. Voy. Ois. p. 379, t. xliv. f. 1.
Picus lignarius, Scl. Cat. A. B. p. 334.
Chaluani, Cochabamba (O.).
381. Picus cactorum, d'Orb. Voy. Ois. p. 378, t. lxii. f. 2.

Chaluani and Chilon, Prov. Mizque (0.).
382. Chloronerpes fumigatus (d’Orb.); d’Orb. Voy. Ois. p. 380, t. lxv. f. 1.

Santa Cruz de la Sierra and Prov. Chiquitos ( $O$ ) ; Tilotilo, Prov. Yungas (B.).
383. Chloronerpes malherbit, Scl.

Picus nigriceps, d'Orb. Voy. Ois. p. 380, t. lxv. f. 2.
Chloronerpes malherbii, Scl. Cat. Am. B. p. 338.
Palca Graùde, Prov. Ayupaya (O.).
384. Chloronerpes ruficeps (Spix).

Campias ruficeps, Cab. et Heine, Mus. Hein. iv. p. 153.
Simacu (B.).
385. Chloronerpes rubiginosus (Sw.).

Picus canipileus, d'Orb. Voy. Ois. p. 379, t. lxiii. f. 2.
Chupé, Prov. Yungas ( 0. ) ; Tilotilo, Prov. Yungas (B.).
386. Melanerpes cruentatus (Bodd.); Scl. Cat. Am. B. p. 341.

Simacu (B.).
387. Hypoxanthus atriceps, Scl. et Salv. P. Z. S. 1876, p. 251.

Hypoxanthus brevirostris, Tacz. P. Z. S. 1874, p. 546 (?)
Ramosani, Tilotilo (B.).
388. Colaptes rupicola, d'Orb. Voy. Ois. p. 377, t. lxii. f. 1. La Paz, Chuquisaca, Potosi (O.).

## Family Момотide.

389. Момotus nattereri, Scl.

Prionites brasiliensis, d'Orb. \& Lafr' Syn. Av. ii. p. 34.
Momotus nattereri, Scl. Cat. Am. B. p. 262.
Yungas (0.).
390. Urospatha martil (Spix).

Prionites martii, Spix, Av. Bras. ii, p. 46, t. 60.
Apollo (B.).

## Family Alcedinide.

391. Ceryle torquata (Linn.).

Alcedo torquata, d'Orb. \& Lafr. Syn. Av. ii. p. 34.
Santa Cruz de la Sierra, Chiquitos (O.).
392. Ceryle amazona (Lath.).

Alcedo amazona, d'Orb. \& Lafr. Syn. Av. ii. p. 34.
Chiquitos (O.).
393. Ceryle americana (Gm.).

Alcedo americana, d'Orb. \& Lafr. Syn. Av. ii. p. 34.
Chiquitos, Valle Grande (0.).

## Family Trogonide.

394. Trogon personatus, Gould, Mon. Trog. ed. ii. pl. 10. Tilotilo (B.).
395. Trogon variegatus, Spix; Gould, Mon. Trog. ed. ii. pl. 19.

Tilotilo (B.).
396. Pharomacrus antisianus, d'Orb.

Trogon antisianus, d'Orb. Mag. de Zool. 1837, Ois. t. 85.
Trogon antisiensis, d'Orb. Voy. Ois. p. 381, t. lxvi. f. i.
Pharomacrus antisianus, Gould, Mon. Trog. ed. ii. pl. 2.
Prov. Yungas (0.).
Family Galbulide.
397. Galbula rufoviridis, Cab. ; Scl. Cat. Am. B. p. 266. Bolivia, Chiquitos (0.). Mus. Paris. 398. Brachygalba melanosterna, Scl. P. Z. S. 1855, p. 15. Guarayos (0.). Mus. Paris.

Family Bucconide. 399. Bucco chacuru, Vieill. ; Scl. Syn. Bucc. p. 12. Tilotilo (B.) ; Yungas and Santa Cruz (O.). Mus. Paris. 400. Bucco striatipectus, Scl. P. Z. S. 1853, p. 123, et Cat. Am. B. p. 271.
"Chaunornis fammulata, Verreaux," Mus. Paris. Santa Cruz (O). Mus. Paris.
401. Malacoptila fulvogularis, Scl. P. Z. S. 1853, p. 123. Tilotilo (B.).
402. Monasa nigrifrons (Spix) ; Scl. Cat. Am. B. p. 274. Bolivia (Behn, Mus, P. L. S.).

## Family Cuculide.

403. Piaya cayana (Linn.); Scl. Cat. Am. B. p. 321. Juanani, Tilotilo (B.).

## Family Rampeastide.

404. Rampeastos inca, Gould, Mon. Ramph. ed. 2, pl. x.

Chimoree, Yuracares (Bridges, teste Gould).
405. Rampeastos culminatus, Gould, Mon. Ramph. ed. 2, pl. xi.

Guanai, Tilotilo (B.).
406. Pteroglossus castanotis, Gould, Mon. Ramph. ed. 2,

Tilotilo (B.).
407. Andigena cucullatus (Gould); Gould, Mon. Ramph. ed. 2, pl, xxxix.

Tilotilo (B.) ; Cochabamba (Bridges, teste Gould).
408. Aulacorhampius derbianus (Gould); Gould, Mon. Ramph. ed. 2, pl. xliii.

Ronco, Yuracares (Bridyes, teste Gould); Nairapi, Tilotilo (B).
409. Aulacorhamphus cefruleicinctus (d'Orb.).

Pteroglossus carveicinctus, d'Orb. Voy. Ois. p. 382, t. Jxvi. f. 2.
Aulacorhamphus ccrruleicinctus, Gould, Mon. Ramph. ed. 2, pl. xlvii.

Chapaguaia, Tilotilo, Prov. Yungas (B.) ; Yanacache, Chupé and Irupana, Prov. Yungas (O.).

## Family Capitonide.

410. Capito auratus (Dumont) ; Marsh. Mon. Barb. pl. 64. Pillon (B.).
411. Capito versicolor (Müller); Marsh. Mon. Barb. pl. 68. Tilotilo (B.).

## Family Psittacide.

412. Ara rubrigenis, Lafr. Rev. Zool. 1847, p. 65.

Sittace lafresnagi, Finsch, Papag. i. p. 394.
Bolivia ( 0 . in Mus. Lugd.).
413. Ara militaris (Linn.).

Sittace militaris, Finsch, Papag. i. p. 396.
Bolivian Andes (Castelnau, fide Finsch).
414. Ara macao (Linn.) ; Finsch, Papag. i. p. 398.

Santa Cruz de la Sierra (Burmeister, teste Finsch).
415. Ara chloroptera, Gray.

Sittace chloroptera, Finsch, Papag. i. p. 403.
Santa Cruz de la Sierra (Burmeister, teste Finsch).
4i6. Ara ararauna (Lim.); Finsch, Papag. i. p. 410.
Santa Cruz de la Sierra (Burmeister, teste Finsch).
417. Ara severa (Linm.) ; Scl. Cat. Am. B. p. 345.

Bolivia (Bridges, Mus. P. L. S.) ; Santa Cruz de la Sierra (Burm., teste Finsch).
418. Ara auricollis (Cassin).

Sittace auricollis, Finsch, Papag. i. p. 423.
Bolivia (Bridges, Mus. Brit.) ; Santa Cruz de la Sierra (Burm., teste Finsch).
419. Conurus acuticaudatus, Vieill.; Scl. Cat. Am. B. p. 347 ; Finsch, Papag. i. p. 450.

Bolivia (Bridges, Mus. P.L. S. et Brit.).
420. Conurus mitratus, Tsch.; Finsch, Papag. i. p. 461.

Consata (B.).
421. Conurus weddelli, Deville ; Finsch, Papag. i. p. 497.

Bolivia (Bridges, Mus. Brit.). Santa Cruz de la Sierra (Burm., teste Finsch).
422. Conurus moline, Mass. \& Souanc.; Gray, List of Psitt. p. 40 .

Bolivia (Bridges, Mus. Brit.) ; Tilotilo (B.).
423. Bolborhynchus monachus (Bodd.) ; Finsch, Papag. ii. p. 114.

Bolivia (Bridges, teste Finsch).
424. Bolborhynchus luchsi, Finsch, Papag. ii. p. 121.

Bolivia (Bridges, Mus. Brit.).
425. Bolborhynchus aymara (d'Orb.); Finsch, Papag. ii. p. 125.

Conurus aymara, Scl. Cat. Am. B. p. 350.
Sorata (B.) ; Bolivia (O.).
426. Bolborhynchus orbignesius (Bp.) ; Finsch, Papag. i: p. 129.

Bolivia (O., Mus. Par., et Bridges, Mus. Lugd.). Island of Puriti, Lake Titicaca (Forbes, Mus. P. L. S.).
427. Chrysotis farinosa (Bodd.); Finsch, Papag. ii. p. 565. Santa Cruz de la Sierra (Burm., teste Finsch.).
428. Chrysotis mercenaria (Tsch.) ; Finsch, Papag. ii. p. 594. Yungas (O., Mus. Paris.).
429. Pionus menstruus (Linn.) ; Finsch, Papag. ii. p. 441. Pillon (B.).
430. Pronus maximiliani (Kuhl) ; Finsch, Papag. ii. p. 448. Santa Cruz de la Sierra (Burm., teste Finsch).
431. Pronus tumulutuosus (Tsch.) ; Scl. in Rowley's Orn. Misc. iii. p. 8, pl. lxxxi.

Tilotilo (B.).
432. Pionopsitta melanotis (Lafr.).

Pionias melanotis, Finsch, Papag. ii. p. 412.
Tilotilo (B.) ; Bolivia (O.).

## Family Strigide.

433. Strix flammea, Linn.

Strix perlata, d'Orb. \& Lafr. Syn. Av. i. p. 9; d'Orb. Voy. Ois. p. 135.

Provinces of Santa Cruz de la Sierra, Chiquitos, Moxos, Yungas, \&c. (O.).
434. Asio brachyotus (Forster).

Otus brachyotus, d'Orb. \& Lafr. Syn. Av. i. p. 9 ; d'Orb. Voy. Ois. p. 134.

High plateau of Bolivia (O.).
435. Bubo magellanicus (Gm.) ; d’Orb. \& Lafr. Syn. Av. i. p. 9; d'Orb. Voy. Ois. p. 137 ; Sharpe, Cat. B. ii. p. 29.

Provinces of Chiquitos and Moxos (O.).
436. Scops brasilianus (Gm.) ; Scl. \& Salv. Ex. Orn. p. 102.

Scops choliba, d’Orb. \& Lafr. Syn. Av. i. p. 8; d'Orb. Voy. Ois. p. 132.

Provinces of Chiquitos and Moxos (O.).
437. Pulsatrix torquata (Daud.).

Noctua torquata, d'Orb. \& Lafr. Syn. Av. i. p. 8; d'Orb. Voy. Ois. p. 126.

Santa Cruz de la Sierra (O.).

## Family Falconide.

438. Circus cinereus, Vieill. ; d’Orb. \& Lafr. Syn. Av. i. p. 7; d'Orb. Voy. Ois. p. 110.

Bolivia (O.).
439. Circus macropterus, Vieill. ; d'Orb. \& Lafr. Syn. Av. i. p. 7 ; d'Orb. Voy. Ois. p. 112.

Prov. Chiquitos (O.)
440. Asturina nitida (Lath.).

Astur nitida, d'Orb. \& Lafr. Syn. Av. i. p. 5; d'Orb. Voy. Ois. p. 95.

Prov. Chiquitos (O.).
441. Asturina saturata, Scl. \& Salv. P Z. S. 1876, p. 357.

Apollo, Tilotilo (B.).
442. Asturina pucherani, Scl. \& Salv. P.Z. S. 1869, p. 133, et Ex. Orn. p. 177, t. 89.

Astur magnirostris, d'Orb. \& Lafr. Syn. Av. i. p. 5; d'Orb. Voy. p. 91.

Chiquitos ( 0 .).
443. Buteola brachyura (Vieill.) ; Sharpe, Cat. i. p. 201. Tilotilo, Prov. Yungas (B.).
444. Buteo erythronotus, King.

Buteo tricolor, d'Orb. \& Lafr. Syn. Av. i. p. 6 ; d’Orb. Voy. Ois. p. 106, t. iii. f. 1, 2. La Paz (O.).
445. Buteo unicolor, d’Orb. \& Lafr. Syn. Av. i. p. 6 ; d'Orb. Voy. Ois. p. 109.

This seems to be a distinct species, judging from the single example in the Paris Museum.

Palca, Prov. Ayupaya (O.).
446. Buteogallus nigricollis (Lath.).

Buteo busarellus, d'Orb. \& Lafr. Syn. Av. i. p. 6 ; d'Orb. Voy. Ois. p. 103.

Provinces of Chiquitos and Moxos (0.).
447. Urubitinga zonura (Shaw).

Morphnus urubitinga, d'Orb. \& Lafr. Syn. Av. i. p. 4 ; d'Orb. Voy. p. 84.

Prov. Chiquitos (O.).
448. Urubitinga unicincta (Temm.).

Astur unicinctus, d'Orb. \& Lafr. Syn. Av. i. p. 5 ; d’Orb. Voy. Ois. 93.
Santa Cruz de la Sierra (O.).
449. Urubitinga meridionalis (Lath.).

Buteo rutilans, d'Orb. \& Lafr. Syn. Av. i. p. 6 ; d'Orb. Voy. Ois. p. 104.

Provinces of Chiquitos and Moxos (O.).
450. Geranoaetus melanoleucus (Vieill.).

Haliaetus melanoleucus, d’Orb. \& Lafr. Syn. Av. i. p. 3; d'Orb. Voy. p. 76.

Bolivia (O.).
451. Thrasaetus harpyia (Ling.).

Harpyia destructor, d'Orb. \& Lafr. Syn. Av. i. p. 4; d'Orb. Voy. p. 81.

Prov. Moxos, Cochabamba and Santa Cruz de la Sierra (O.).
452. Accipiter ventralis, Scl. ; Scl. \& Salv. Ex. Orn. p. 25, t. xiii.

Nisus striatus, d'Orb. \& Lafr. Syn. Av. i. p. 4 ; d'Orb. Voy. Ois. p. 88?
Territory of the Yuracares Indians (O.) ; Tilotilo, Prov. Yungas (B.).
453. Accipiter poliogaster (d'Orb. \& Lafr.).

Nisus poliogaster, d'Orb. \& Lafr. Syn. Av. i. p. 4 ; d'Orb. Voy. Ois. p. 89.

Santa Cruz de la Sierra and Chiquitos (O.).
We have not seen Bolivian examples of this species.
454. Micrastur concentricus (Lesson).

Nisus concentricus, d'Orb. \& Lafr. Syn. Av. i. p. 4 ; d'Orb. Voy. Ois. p. 88.

Prov. Yungas ( 0 .).
455. Geranospizias hemidactyla (Temm.).

Nisus hemidactylus, d'Orb. \& Lafr. Syn. Av. i. p. 4 ; d'Orb. Voy. Ois. p. 86.

Prov. Chiquitos (0.).
456. Hypotriorchis femoralis (Temm.).

Falco femoralis, d'Orb. \& Lafr. Syn. Av. i. p. 7 ; d'Orb. Voy. Ois. p. 116.

Provinces of Moxos and Chiquitos, environs of Chuquisaca (0.).
457. Tinnunculus sparverius (Linn.).

Falco sparverius, d'Orb. \& Lafr. Syn. Av. i. p. 8 ; d'Orb. Voy. Ois. p. 119.

Provinces of La Paz, Chuquisaca, and Chiquitos (0.).
458. Elanoides furcatus (Linn.).

Milvus furcatus, d'Orb. \& Lafr. Syn. Av. i. p. 5; d'Orb. Voy. Ois. p. 100.

Provinces of Moxos and Chiquitos ( $O$.).
459. Ictinia plumbea (Vieill.) ; d'Orb. \& Lafr. Syn. Av. i. p. 101 ; d'Orb. Voy. Ois. p. 101.

Tilotilo, Prov. Yungas (B.); Provinces of Chiquitos and Moxos (O.).
460. Harpagus bidentatus (Lath.).

Diodon bidentatus, d'Orb. \& Lafr. Syn. Av. i. p. 8; d'Orb. Voy. Ois. p. 122.

Mission de Sauto Corazon, Prov. Chiquitos (O.).
461. Herpetótheres cachinnans, Vieill.

Macagua cachinnans, d'Orb. \& Lafr. Syn. Av. i. p. 5 ; d'Orb. Voy. Ois. p. 96.

Provinces of Santa Cruz de la Sierra, Moxos, and Chiquitos (O.). 462. Milvago chimango (Vieill.).

Polyborus chimango, d'Orb. \& Lafr. Syn. Av. i. p. 3; d'Orb. Voy. Ois. p. 60, t. ii. f. 3, 4.

Bolivia ( $O$.).
463. Milvago chimachima (Vieill.).

Polyborus chimachima, d’Orb. \& Lafr. Syn. Av. i. p. 3; d'Orb. Voy. Ois. p. 63.
Santa Cruz and Chiquitos (O.).
464. Milvago megalopterus (Meyen).

Phalcobrenus montanus, d'Orb. \& Lafr. Syn. Av. i. p. 2; d'Orb. Voy. Ois. p. 51, t. ii. f. 1, 2.

La Paz and Cochabamba (O.).
465. Polyborus tharus (Mol.).

Polyborus vulgaris, d'Orb. \& Lafr. Syn. Av. i. p. 3; d'Orb. Voy. Ois. p. 55, t. i. f. 2 (egg).

Bolivia (O.).

## Family Cathartide.

466. Cathartes aura (Linn.) ; d'Orb. \& Lafr. Syn. Av. i. p. 2 ; d'Orb. Voy. Ois. p. 38, pl. i. f. 2.

Provinces of Moxos and Chiquitos (O.).
467. Cathartes atratus (Bartr.).

Cathartes urubu, d'Orb. \& Lafr. Syn. Av. i. p. l; d'Orb. Voy. Ois. p. 31.

Bolivia (O.).
468. Gypagus papa (Linn.).

Sarcorhamphus papa, d'Orb. \& Lafr. Syn. Av. i. p. 1.
Bolivia (O.).
469. Sarcorhamphus gryphus (Linn.) ; d'Orb. \& Lafr. Syn. Av. i. p. 1 ; d'Orb. Voy. Ois. p. 17.

Andes of Bolivia (O.).
Family Columbide.
470. Columba albilinea (Bp.).

Chlorcenas albilinea, Bp. Consp. ii. p. 51.
Ramosani, Tilotilo (B.).
471. Columba plumbea, Vieill.

Chlorcenas plumbea, Bp. Consp. ii. p. 53.
Mapiri, Tilotilo (B.).
472. Zenaida maculata (Vieill.) ; Bp. Consp. ii. p. 82.

Huachapampa (B.).
473. Metriopelia aymara (Knip \& Prév.) ; Bp. Consp. ii. p. 76 .

Tacora (0.).
474. Columbula picui (Temm.) ; Bp. Consp. ii. p. 80.

Sorata (B.).
475. Chamepelia cruziana (Knip \& Prév.); Bp. Consp. ii. p. 80.

Santa Cruz (0.).
476. Leptoptila megalura, sp. n.

Supra late brunnea, fronte alba verticem versus plumbea; capite postico et nucha, cervice postica et dorso antico vinaceis, illis rufescenti tinctis, his violaceo vix coruscantibus; subtus vinacea, facie tota, abdomine medio et crisso albis; cauda rectricibus, nisi in duabus mediis, albo terminatis, subalaribus et remigibus intus (apicibus exceptis) late cinnamomeis; rostro nigro, pedibus rubris. Long. tota $11 \cdot 5$, alæ $5 \cdot 7$, caudce 4.7 .
Hab. Tilotilo, Prov. Yungas, Bolivia (Buckley).
Mus. S.-G.
Obs. L. rufaxille ex Peruviâ et Amazoniâ affinis, sed staturâ majore, caudâ multo longiore, genis albidis nec violaceo tinctis, distinguenda.

This species belongs to the $\boldsymbol{L}$.rrufaxilla section of the genus, in which the top of the head is ash-coloured. L. rufaxilla was originally based upon a Guiana bird ; and to this species we refer specimens from Yquitos, on the Upper Amazons, and from the Cosnipata valley in Eastern Peru. The bird now described differs from these in its greater size, the greater length of the tail, and in having the face almost pure white. Buckley's collection contained two skins.
477. Geotrygon montana (Linn.); Scl. \& Salv. Ex. Orn. p. 79. Apollo, Tilotilo (B.).
478. Geotrygon frenata (Tsch.) ; Scl. \& Salv. P. Z. S. 1873, p. 785.

Simacu, Yuyo, Tilotilo (B.).

## Family Cracide.

479. Penelope obscura, Temm. ; Sclat. \& Salv. P. Z. S. 1870, p. 525.

Bolivia (Bridges).
480. Penelope sclateri, Gray; Scl. \& Salv. P. Z. S. 1876, p. 527.

Bolivia (Bridges) ; Tilotilo (B.).
481. Ortalida guttata (Spix) ; Scl. \& Salv. P. Z. S. 1870, p. 537.

Tilotilo (B.).

## Family Tetraonide.

482. Odontophorus marmoratus, Gould, P. Z. S. 1843, p. 107. Yuyo (B.).

## Family Rallide.

483. Porzana mllanophea (Vieill.); Scl. \& Salv. P. Z. S• 1868, p. 453, et Ex. Orn. p. 107, t. liv.

Chiquitos ( $O$.).
484. Porphyriops melanops (Vieill.) ; Scl. \& Salv. P. Z. S. 1868, p. 461.

Bolivia (O., Mus. Paris).
485. Fulica cornuta, Bp. ; Scl. \& Salv. P. Z. S. 1868, p. 463, et Ex. Orn. p. 120.

Potosi (Cast. et Dev., Mus. Paris).
486. Fulica ardesiaca, Tsch.; Scl. \& Salv. P. Z. S. 1868, p. 464, et Ex. Orn. p. 113, t. lvii.

Bolivian Andes ( 0. .).
487. Fulica leucoptera, Vieill. ; Scl. \& Salv. P. Z. S. 1868, p. 468, et Ex. Orn. p. 117, t. lix.

Chiquitos (O., Mus. Paris).

## Family Thinocoride.

488. Attagis latreillif, Lesson; Gray, List of Gall. p. 96.

Bolivia (Bridges, Mus. Brit.).
489. Thinocorvs orbignianus, Geoffr. \& Less.; Scl. \& Salr. P. Z. S. 1867, p. 989.

Cinti (B.).

## Family Scolopacide.

490. Gallinago jamesoni (Bp.); Scl. \& Salv. Ex. Orin. p. 196. Cillutincara ( $B$.).
491. Tringa maculata (Vieill.); Scl. \& Salv. P. Z. S. $1873^{\circ}$ p. 455.

Tilotilo (B.).
Family Laride.
492. Larus serranus, Tsch.; Scl. \& Salv. P. Z. S. 1871, p. 577. Bolivia (O.).

## Family Podicipitide.

493. Podiceps calliparius, Less. ; Scl. \& Salv. Ex. Orn. p. 190. Potosi ( $O$.).
494. Centropelma micropterum (Gould); Scl. \& Salv. Es. Orn. p. 189, pl. 95.

Lake Titicaca (Forbes).
Proc. Zool. Soc.-1879, No. XLI.
495. Crypturus obșoletus (Vieill.); Burm. Syst. Ueb. iii. p. 316.

Tilotilo (B.).
496. Crypturus radiatus (Gray).

Tinamus radiatus, Gray, List of Gall. p. 100.
Nothocercus scolopax, Bp. Tabl. d. Gall. p. 18 (?)
Bolivia (Bridges, Mus. Brit.).
497. Rhynchotus maculicollis, Gray, List of Gall. p. 102.

Bolivia (Bridges).
See Bridges's notes (P. Z.S. 1846, p. 9) in relation to this and other Tinamous of Bolivia.
498. Nothoprocta ornata (Gray).

Nothoprocta ornata, Scl. \& Salv. Nomencl. p. 153.
Rhynchotus ornatus, Gray, List of Gall. p. 102.
Bolivia (Bridges).
499. Nothoprocta pentlandi (Gray).

Nothoprocta pentlandi, Scl. \& Salv. Nomencl. p. 153.
Rhynchotus pentlandi, Gray, List of Gall. p. 103.
Nothura punctulata, Mus. Paris (partim).
Andes of Bolivia (Pentland, Mus. Brit.). Sicasica and Chiquitos (O., Mus. Paris).

The specimens of this species in the Paris Museum are marked " Nothura punctulata, Gay" ${ }^{1}$; but we consider N. pentlandi distinct, though nearly allied. N. doeringi, Cab. (J. f. O. 1878, p. 198) is a third species of the same group.
500. Nothura marmorata, Gray; Gray, List of Gall. p. 104.

Cinti (O.).
501. Tinamotis pentlandi, Vig. P. Z.S. 1836, p. 79 ; Gray \& Mitch. Gen. B. t. 137.

Andes near Potosi (Bridyes). Mus. Brit.

## APPENDIX.

List of Bolivian species mentioned by d'Orbiguy but not identified by the authors of this paper:-

1. Emberiza obscura, d'Orb. \& Lafr. Syn. Av. i. p. 81.

Prov. Chiquitos (O.).
2. Emberiza uropygialis, d'Orb. \& Lafr. Syn. Av. i. p. 75.

Andes of Bolivia (O.).
${ }^{1}$ Gay, Hist. Phys y Pol. de Chile, Zool. i. p. 301.
3. Emberiza olivascens, d'Orb. \& Lafr. Syn. Ar. i. p. 75.

La Paz (0.).
4. Icterus maxillaris, d’Orb. \& Lafr. Syn. Av. ii. p. 6; d'Orb. Voy. Ois. p. 367, t. lii. f. 2, 3. Cyrtotes maxillaris, Bp. Consp. i. p. 437.

Cochabamba (O.).
5. Icterus chrysopterus, d'Orb. \& Lafr. Syn. Av. ii. p. 5.

Bolivia (O.).
6. Popoaza montana, d’Orb. \& Lafr. Syn. Av. i. p. 64 ; d’Orb. Voy. Ois. p. 352.

La Paz aud Inquisivi, Prov. Sicasica, Palca, Prov. Ayupaya (0.).
7. Muscisaxicola striaticeps, d’Orb. \& Lafr. Syn. Av. i. p. 66 ; d'Orb. Voy. Ois. p. 356, t. xli. f. 1.

Environs of La Paz (0.).
8. Muscicapa oliracea, d'Orb. \& Lafr. Syn. Av. i. p. 54. Muscicapa boliviana, d'Orb. Voy. Ois. p. 328.

Prov. Yungas (O.).
9. Muscicapa ventralis, d’Orb. \& Lafr. Syn. Av. i. p. 53. Muscicapara ventralis, d'Orb. Voy. Ois. p. 328.

Territory of the Guarayos Indians ( $O$.).
10. Muscicapa obsoleta, d'Orb. \& Lafr. Syn. Av. i. p. 53. Muscicapara obsoleta, d'Orb, Voy. Ois. p. 328.

Prov. Chiquitos (O.).
11. Muscicapa stramineoventris, d'Orb. \& Lafr. Syn. Av. i. p. 53. Muscicapara stramineoventris, d’Orb. Voy. Ois. p. 327.

Santa Ana, Prov. Chiquitos (O.).
12. Muscicapa albicilla, d'Orb. \& Lafr. Syn. Av. i. p. 52. Muscicapara gaimardi, d'Orb. Voy. Ois. p. 326.

Territory of the Yuracares Indians (O.).
13. Muscicapa angustirostris, d'Orb. \& Lafr. Syn. Av. i. p. 52. Muscicapara angustirostris, d'Orb. Voy. Ois. p. 325.

Prov. Yungas (0.).
14. Muscicapa elegans, d’Orb. \& Lafr. Syn. Av. i. p. 52. Muscicapa viridicata, d'Orb. Voy. Ois. p. 325.

Santa Corazon, Prov. Chiquitos (O.).
15. Muscipeta querula, d'Orb. \& Lafr. Syn. Av. i. p. 47. Muscipeta acadica, d'Orb. Voy. Ois. p. 318.

Mission de Santa Corazon, Prov. Chiquitos (O.).
16. Muscipeta binaculata, d'Orb. \& Lafr. Syn. Ar. i. p. 48; d'Orb. Voy. Ois. p. 320.

Prov. Yungas (O.).
17. Tyrannus fumigatus, d'Orb. \& Lafr. Syn. Av. i. p. 43; d'Orb. Voy. Ois. p. 307.

Irupana, Prov. Yungas ( $O$.).
18. T. rufescens, d'Orb. \& Lafr. Syn. i. p. 44.

Garayos (0.).
[This is a species of Attila; but we are not certain whether it is $A$. thamnophiloides or an allied species.]
19. Certhilauda maritima, d'Orb. \& Lafr. Syn. Av. i. p. 72; d'Orb. Voy. Ois. p. 360, t. xliv. f. 1.

Cobija ( 0. ).
20. Upucerthia andecola, d'Orb. \& Lafr. Syn. Av. ii. p. 21 ; d'Orb. Voy. Ois. p. 371, t. lvi. f. 2.

Valley of La Paz, Inquisivi, Totora, and Valle Grande (O.).
21. Anabates gutturatus, d’Orb. \& Lafr. Syn. Av. ii. p. 14.

Territory of the Yuracares Indians (0.).
22. Anabates striaticeps, d'Orb. \& Lafr. Syn. Av. ii. p. 19; d'Orb. Voy. Ois. p. 254.

Prov. Sicasica (O.).
23. Dendrocolaptes rectirostris, d'Orb. \& Lafr. Syn Av. ii. p. 12. Prov. Chiquitos (O.).
24. Thamnophilus lafresnayanus, d'Orb. \& Lafr. Syn. Av. i. p. 13. Formicivora lafresnayana, d'Orb. Voy. Ois. p. 182, t. vi. f. J.

Cochabamba (0.).
25. Thamnophilus afinis, d'Orb. \& Lafr. Syn. Av.i. p. 12 ; d'Orb. Voy. Ois. p. 175.

Mission de Santa Ana, Prov. Chiquitos (O.).
26. Cypselus montivagus, d'Orb. \& Lafr. Syn. Av. i. p. 70; d'Orb. Voy. Ois. p. 357, t. xlii. f. 1.

Las Habras Mountains between Samaypata and Santa Cruz de la Sierra (O.).
27. Caprimulgus psalurus, d'Orb. \& Lafr. Syn. Av. i. p. 67.

Chiquitos ( 0. ).
28. Ornismya macrourus, d’Orb. \& Lafr. Syn. Av. ii. p. 26.

Chiquitos, Moxos (O.).
No specimen in Paris Museum, $v$. Elliot, Ibis, 1877, p. 134.
29. Ornismya longirostris, d’Orb. \& Lafr. Syn. Av. ii. p. 29.

Guarayos (O.).
No specimen in Paris Museum (Elliot, l.c.).
30. Noctua ferox, d'Orb. \& Lafr. Syn. Ar. i. p. 8 ; d'Orb. Voy. Ois. p. 127.

Prov. Chiquitos (0.).
31. Ibycter gymnocephalus, d'Orb. \& Lafr. Syn. Av. i. p. 2; d'Orb. Voy. Ois. p. 50.

Cochabamba (O.).

> 3. On the Acanthomys leucopus of Gray. By Edward R. Alston, F.L.S., F.Z.S., \&c.
[Received June 3, 1879.]
In the first part of Prof. Schlegel's new periodical, 'Notes from the Royal Zoological Museum of the Netherlands at Leyden,' Dr. F. A. Jentink identifies two specimens of a spiny Rat from Celebes with the North-Australian species described by the late Dr. Gray under the name of Acanthomys leucopus ${ }^{1}$. The specific identity of a Mus from Celebes with one from the continent of Australia seemed so unlikely that I suspected that Dr. Jentink might have been misled by Gray's very insufficient description ; and I was consequently induced to reexamine the types in the British Museum. A comparison of the description given below with that of Dr. Jentink will show that the two species are evidently quite distinct, the Celebes animal being a fourth smaller than the Australian, with much smaller feet, and having the tail longer than the head and body, thinly haired and tufted, instead of shorter and naked.

In a note to my report on the Rev. G. Brown's collection, I remarked that Gray's species belonged to the restricted genus Mus and not to Acanthomys, Lesson (=Acomys, Geoffroy), and that it would require to be renamed, the specific name being preoccupied by the common North-American White-footed Mouse, the Mus leucopus (Rafinesque) of Desmarest and other writers, Hesperomys leucopus of more recent zoologists ${ }^{2}$. Dr. Jeutink also places the Australian species in the genus Mus, but on different grounds; he rejects the genus Acomys or Acanthomys altogether, as being founded merely on the superficial character of the possession of spinous hairs. But that group was founded by the older Geoffroy on the Mus cailirinus of Desmarest; and it has been restricted by subsequent writers to the small group of Ethiopian Mures in which a spiny coat is combined with marked cranial peculiarities, notably with shallow pterygoid fossæ, very small incisive foramina and slightly developed coronoid processes ${ }^{3}$.

[^51]Although Dr. Jentink places the species in the genus Mlus, he retains Gray's specific name on the ground that Mus leucopus (Raf.) has since been separated as a Hesperomys. In this I cannot agree; because a species has been removed to a new genus its name does not become unoccupied in the old one. Surely Dr. Jentink would not think it admissible to name a new Mouse Mus aquaticus because the Linnæan Mus aquaticus has been separated as an $A r$ vicola? Nor can I see any analogy in his further suggestion that "if Alston objects to the name of this species he should also reject the name Uromys rufescens, and adopt the specific name muscivora, Pierson Ramsay, because, under the name of Mus rufescens, a Mouse was already described by Gray." The cases will only be parallel when Dr. Jentink can prove that my Uromys rufescens ${ }^{1}$ is a true Mus, and does not belong to the perfectly distinct genus Uromys. When he has shown this I will readily withdraw my name in favour of Mr. Ramsay's.

The following is a fuller description than Gray's of the NorthAustralian Spiny Rat, which I propose to call

Mus terre-regine, sp.n.
Acanthomys leucopus, Gray, P. Z. S. 1867, p. 598 (descr. orig., vide suprà).

Mus leucopus, Jentink, Notes fr. Leyden Mus. i. p. 8 (part., nec Desmarest).

Fur stiff and harsh both above and below, most of the hairs being developed into flattened channelled spines; on the back are many longer cylindrical hairs. Whiskers weak, not longer than the head, mixed black and white. Ears rather large, rounded, perfectly naked. Feet remarkably large and stout. Tail considerably shorter than the head and body, naked, the scattered minute hairs being hardly visible to the naked eye. Colour above dark reddish brown ${ }^{2}$, the spiny hairs being dusky, tipped with rufous, the longer hairs black; lips, lower parts of cheeks, chin, breast, belly, inside of limbs, and feet yellowish white ${ }^{3}$; tail dusky, irregularly marked with yellowish patches and rings.

Measurements of type specimens ( $a$, an adult, and $b$, a young female):-

|  | in. |  | millims. |
| :---: | :---: | :---: | :---: |
| Length of head and body | 8.25 | $=$ | 210 |
| tail | 7•10 | = | 180 |
| ear | $\cdot 75$ | = | 20 |
| hind foot | 1.57 | = | 40 |

[^52]

Hab. Cape York, Queensland (Damen, Mus. Brit.).
Dr. Jentink's Celebes Mouse, my Mus browni from Duke-of-York Island ${ }^{1}$, and $M$. terre-regince, are all nearly related, although perfectly distinct; and allied species will doubtless be discovered in other parts of the Eastern Archipelago.

## 4. On some African Species of the Lepidopterous Genus Papilio. By W. L. Distant. <br> [Received June 7, 1879.]

## (Plate XLVII.)

The following short paper gives some notes taken during an examination recently made of the fine collection of African Papiliones in the collection of Mr. F. J. Horniman. Most of the WestAfrican specimens have been obtained from the Calabar district (Isubu, Mongo-ma-lobah, Calabar) ; and these are peculiarly interesting as marking a district of which the insect fauna differs in many slight respects, though seldom specifically, from that of the neighbouring district of the Gold Coast. I have been forced to this conclusion not only from the examination of the Butterflies of this genus, but from having already worked out large collections of Hemiptera from the same locality, and from information supplied me by accomplished Coleopterists as to the insects of their own order. From Sierra Leone the divergence of the Calabar district is much greater, many insects being peculiar to each locality.

## Papilio ophidocephalus, Oberthur, Études d'Entomologie, p. 13 (1878).

M. Oberthur has given the above name to the S.-African form figured by Trimen as $P$. menestheus (Rhop. Afr.-Austr. t. 2. f. 1). A long series in this collection from both S. and E. Africa shows the characters to be quite constant; and a $9 P$. menestheus from the Calabar district agrees with the typical characters of the $\delta$ of that species as figured by Drury.
Papilio hornimani, n. sp. (Plate XLViI. figs. 1, 2 di, 3 ㅇ.)
0t. Wings above black, marginal fringe streaked with pale sulphuryellow. Fore wings with a straight, oblique, transverse, green fascia, only divided by the nervules, extending from just inside lower apical portion of discoidal cell to about centre of interior margin. Above

$$
{ }^{1} \text { P. Z. S. 1877, p. } 123 .
$$

this are three spots-one just inside upper apical portion of cell, another about same size parallel to it just outside cell and upper disco-cellular nervule, third and smallest immediately above secondand two subapical spots of the same colour situated between third, fourth, and fifth subcostal nervules. Lower wing crossed by a green transverse fascia in continuation of, but slightly broader than that of the fore wing, toothed externally, extending through and beyond apical third of cell to near centre of abdominal margin, where it is again somewhat narrower. A submarginal row of nine rounded green spots situated one below first subcostal nervule, two wide apart te'ween second subcostal nervule and discoidal nervule, and the other six in pairs closer together divided by the median nervules.

Underside with the ground-colour and markings much as in $P$. charopus, West., but upper wings with a submarginal row of four large, crescent-shaped sulphureous patches, situated between the second discoidal nervule and the first, second, and third median nervules. Lower wings with a submarginal row of twelve bright sulphur-coloured spots, situated in pairs between the nervules, and two others of the same colour, one at aual angle and one near lower fourth of abdominal margin.

우. Above generally as in $\delta^{\circ}$. Underside with the four submarginal, sulphureous, crescent-shaped patches to fore wings, but the spots on the hind wings very obscure.

Exp. wings, $0^{7} 4 \frac{1}{2} \mathrm{in}$, ㅇ $4 \frac{8}{10} \mathrm{in}$.
Hab. Magila, East Africa.
Allied to $P$. charopus, West., from which it is at once distinguished by the narrow discal fasciæ above and the different and bright sulphureous markings beneath.

Papilio thersander, Fab. Ent. Syst. iii. i. p. 32, n. 93 (1793); West. Arc. Ent. i. t. 38. f. 1, 2 (1842).

Mr. Kirby in his 'Catalogue Diurn. Lepid.' p. 563, places this species as the female of P. phorcas, Cram. Mr. Horniman's collection, however, contains two male and two female specimens of $\boldsymbol{P}$.thersander; and therefore such cannot be the case. The females agree with Westwood's figure beneath better than above, the transverse macular band of the fore wings being much more broken than is portrayed in that figure. The male differs from the female in having all the macular markings pale yellow instead of creamy white. The male specimens are localized "Aburie, Accra." The female specimens have no locality affixed.

Papilio cypreafila, Butl. Ent. Mo. Mag. v. p. 60 (1868).
P. zenobia, Don. Nat. Rep. v. t. 179 (1827); Luc. Lép. Ex. t. 24. f. 1 (1835).

All the specimens of the above species in this collection received from Isubu, Mongo-ma-lobah, and Calabar agree with the figure of Lucas and differ from that of Donovan (who records his specimen from Sierra Leone) in the smaller size of the marginal white incisures to the hind wings and also in the shape and size of the broken macular
fascia of the fore wings, in this last respect approaching somewhat $P$. odenutus, West. One specimen, however, from the above district, but unfortunately not precisely localized, differs so much that though, judging from one specimen only, it is probably only a variety of ${ }^{2} P$. cyprreafla, yet, as Prof. Westwood regards $P$. odenatus as requiring a specific name, I have followed him (for the sake of uniformity in the nomenclature of these closely allied forms) in distinguishing this apparent variety by a name also:-

## Var. gallienus, Dist.

Differs from P. cypraafia in the much narrower central fascia of the hind wings, which is only 8 millims. wide, and in the smaller and more divided spots of the macular fascia of the fore wings. These fascix and marginal incisures are also of a pale-lemon hue.

Papilio zalmoxis, Hew. Ex. Butt. iii. Pap. t. 6. f. 18 (1864).
One specimen from R. Ogowai (Nassau) is remarkable for its smaller size, $5 \frac{1}{10}$ inch, rather more than 1 inch less in expanse than type aud ordinary specimens. The ground-colour of the underside of posterior wings is also darker ferruginous.

Papilio horribilis, Butl. Lep. Ex. p. 88, t. 34. f. 2 (1872).
Var. calabaricus, Dist.
This variety differs chiefly from Butler's figure in the submarginal row of five spots to the posterior wing. The upper three are very small; but of these the central one is much the largest and the third the smallest and indistinct (sometimes wanting) ; fourth and fifth very much the largest, fifth much smaller than fourth. A red spot on lower portion of abdominal margin. The median fascia to hind wings is generally narrower and straighter than in $P$. horribilis, but in oue specimen agrees in that respect with Butler's figure. I have examined thirteen specimeus, and, finding these characters constant, have distinguished it as a variety of $P$. horribilis, though probably it should be more correctly called a distinct "local race."

Isubu, Mongo-ma-lobah.
5. Note on the Mechanism of Respiration as well as of the Retraction of the Head and Limbs in certain Chelonia. By A. H. Garrod, M.A., F.R.S.

## [Received June 13, 1879.]

For some time past I have been acquainted with the fact that in Tortoises the movement of the limbs influences the degree of inflation of the lungs; and on one occasion I have been able, in a dead specimen of a large species, to blow out a candle by means of the current of air issuing from the nostrils consequent upon $m y$ forcibly pushing inwards one of the previously extended anterior limbs. From this I inferred that the rigidity of the thoracic and abdominal walls (which entirely precludes their being empluyed in respiration) is made up for by the
great difference in the capacity of the thoracic and abdominal cavities which results from differences in the degree of retraction of the limbs. And I also inferred that the activity of the respiratory movementsas in the Lobster, which has some of its larger gills connected with the bases of the ambulacral legs-must depend, in great measure, on the amount of the mechanical force employed in locomotion, in the same way that in the locomotive steam-engine the draught through the boiler-tubes of the furnace depends upon the rapidity of the movement of the engine, because the waste-steam pipe is made to open at the bottom of the fummel.

A specimen of Trionyx perocellatus (three and a half inches in length of carapace), which had died a day or two previously, lying on my dissecting-room table with its neek and limbs fully extended, I happened to take it up by the lateral margins of its shell, when, upon grasping it between my fingers and thumb, I noticed, to my surprise, that its head and limbs immediately retracted to their full extent. At first I was inclined to attribute the movement to the persistence of muscular irritability in the recently dead individual, but, on making a cut into one of the limbs, found that this was not the case.

As frequently as I chose to extend the head and limbs to their full extent they so remained until the body was laterally compressed, whether it happened to be lying on its abdomen or on its back, or in any other position. Immediately it was pinched the limbs were completely withdrawn from view and the head fully retracted-the cervical region of the spine, from being straight, assuming the curve essential to the cephalic retraction.

To determine the mechanism of this unexpected movement was my next proceeding; and I made a small hole in the centre of the plastron which opened into the body-cavity. I then again, with the limbs and head extended, repeated the lateral compression, and found that they were no longer retracted as they had been previously, air rushing in at the newly-formed opening. Upon extending the head and limbs and closing the orifice, full retraction followed lateral compression, as at first. This experiment was repeated several times with the same result.

It then became evident that in laterally compressing the plastron (which in the extended conditian projects beyond the margins of the carapace) its slight convexity is increased, and that this is associated with an augmentation of the capacity of the body-cavity, which, to fill the deficiency thus produced, causes an insucking of the head and limbs upon simple pneumatic principles. The retraction of the head and limbs is therefore nothing more than a movement of suction, and does not depend upon any important direct osteological or myological peculiarities of the animal.

Whether the creature is in the habit during life of employing this suction method of withdrawing itself within its shell is a question that I am not able to determine just now, as the number of Soft Tortoises living at the present time in the Society's Gardens is reduced to a single large Egyptian Trionyx, which is unmanageable and of a more rigid build than the one above described.


## 6. On Acomus inornatus, Salvad. By T. Salvadori, C.M.Z.S.

> [Received June 10, 1879.]

(Plate XLVIII.)
Quite recently I have described (Ann. Mus. Civ. Gen. xiv. p. 250) a new Pheasant from Mount Singalan, on the west coast of Sumatra, which I have named Acomus inornatus. The type specimen, which has long spurs, looks fully adult; and Dr. Beccari, who obtained it, is very positive in stating that it is a male, having dissected it himself. He tells me that, from reports he heard from the natives, and from the feathers found near the traps and belonging to specimens which unfortunately had been eaten by some carnivorous animal, he thinks that the female is of a reddish brown colour. But it is possible that the feathers alluded to, instead of belonging to the female of A. inornatus, were those of the hen of Euplocamus vieilloti, Gray, which most likely is the bird with the white tail-feathers mentioned by Beccari in his letter to Marquis Doria (Ann. Mus. Civ. Gen. xiii. p. 454) dated Kaju Tanam (Sumatra).

As the new bird described by me is wholly black, some one may think, notwithstanding the positive statement of Beccari, that it is not a male of a distinct species, but a female of Acomus erythrophthalmus (Raffles). Such is certainly not the case, according to my ideas; and I think it advisable to point out the differences between my bird and the hen of $A$. erythrophthalmus. I feel the more the necessity of doing so specially, as in describing $A$. inornatus I have neglected to notice the differences between the two birds; and some one may think that I was nol aware of the female of $A$. erythrophthalmus being black and wearing such a dress as may be easily taken for that of a cock-especially as its tarsi are armed with powerful spurs.

The female of $A$. erythrophthalmus has so much the appearance of a male bird that it has been described as a distinct species under the name of Phasianus purpureus, Gray (Ill. Ind. Zool. pl. 42). I think that Blyth was the first (Cat. B. Mus. A. S. B. p. 245) to point out that the bird called $P h$. purpureus is the female of $A$. erythrophthalmus. Subsequently Sclater (P. Z.S. 1863, p. 120) and Elliot, in his Monograph of the Pheasants, agreed in considering $P h$. purpureus to be the female of $A$. erythrophthalmus. It must be said, however, in justice to Raffles that he rightly described (Trans. Linn. Soc. xiii. p. 321) the black bird as the female of his Phasianus erythrophthalmus.

Turning to my Acomus inornatus, I may state that before describing it I had carefully compared it with an adult hen of A. erythrophthalmus, and felt quite convinced, as I am now, that it is a male of a distinct species.

The hen of $A$. erythrophthalmus is smaller, and it is black all over, uniformly shining greenish blue on the upper parts; the head
and throat are not deep black, but rather brown. Moreover the hidden parts of the body-feathers are greyish brown.

The type of my $A$. inornatus is larger, is deep black all over, even on the head, has all the feathers of the upper parts, back, upper tail-coverts and wing-coverts, and also the feathers of the neck and breast, distinctly and sharply edged with shining green, turning to blue near the hind neck, so that all these parts appear beautifully scaled: this scale-like appearance is completely wanting in the hen of $A$. erythrophithalmus. Lastly the hidden part of the feathers does not incline to brown, but is only gregish towards the base.

The accompanying figure (Plate XLVIII.) taken from the typical example, will give a good idea of $A$. inornatus, which is the third known species of the Acomus group.

Turin, May 27, 1879.
7. On some hitherto unrecorded Diurnal Lepidoptera, from Duke-of-York Island and New Ireland, with Descriptions of some apparently new Species. By F. Du-Cane Godman and Osbert Salvin.

## [Received June 14, 1879.]

A further collection of Butterflies recently received from the Rev. G. Brown, has enabled us to clear up a few doubtful points in our former papers on this subject, and to add several very interesting species to the list hitherto known from these islands. Materials are still wanting to render the determination of the lycænidæ satisfactory ; but as regards the larger species Mr. Brown sends us better specimens in every collection, so that little is now wanting in their condition. Judging from the fine new species contained in each collection, we have no doubt that many more remain to be discovered.

Cyllo amabilis, Boisd. Voy. Astr. Lép. p. 140, Atlas, t. 2. f. 1, 2.
A single example of this very distinct species from New Ireland agrees with the figure above quoted.

Atella egista (Cram.).
Mr. Brown has sent us two specimens which probably are referable to this species. They differ, however, in a slight degree from our examples from Ceram and Amboyna, and also from Cramer's figure (Pap. Exot. t. 281. f. C, D), in having the submarginal row of black spots on the secondaries almost obsolete; but we are not inclined to consider this of specific value.

New Ireland.

## Diadema auge (Cram.).

A single female example from the Duke-of-York group of islands is identical with specimens in our collection from Moreton Bay and Sula Islands which we refer to this species.

Mynes eucosmetos, n. sp.
ㅇ․ Exp. $2 \cdot 7$ in. Alis stramineo-albis, costa anticarum et marginibus externe nigris, margine ad apicem anticarum latiore et stramineo atomato, basi et marginibus nigris introrsum glauco tinctis. Subtus anticis basi, apice ipso, costa, et fascia arcuata, a coste ad angulum analem eunte, nigris; area discali et area subapicali albis, hac flavo tincta, macula ovali rufa in medio fascia nigre marginem externum versus notata : posticis late flavis nigro circumcinctis, introrsum vivide flavis et fascia arcuata limbo externo subparalleli notatis, linea angusta alba in limbo anali ipso, costa ad basin rufa, macula juxta eam, et altera angulum analem versus nigris notatis.
This appears to be a very distinct insect : it differs from all the other described species in the extreme brilliancy of the markings of the underside.

Pieris bagoe, Boisd. Voy. Astr. Lép. p. 49.
Pieris eurygania, Godm. \& Salv. P. Z. S. 1878, p. 734, and 1879, p. 159, t. 15. f. 5, 6.

Boisduval described a female Pieris in the Voyage of the 'Astrolabe' under this name, giving as its habitat "Port Praslin (NouvelleHollande)," an evident mistake for "Nouvelle-Irelande." We think it undoubtedly the same as our P. eurygania, of both sexes of which we gave figures in our last paper.

Callidryas catilla (Cram.).
A female of this widely ranging species from the Duke-of-York group of islands.

## Papilio cilix, n. sp.

$\delta^{7}$. Exp. $5 \cdot 6$ in. P. albino similis, sed major et posticarum litura straminea aream mediam occupante multo augustiore et ad limbum internum producta, margine ejus extrorsum inter venas convexo, introrsum fere in linea recta ducto; macula ochracco-rufa angulum analem versus, altera ultra eam minore notata: subtus posticis maculis septem albis in serie transeuntibus, quarum prima et ultima lunulatce sunt, aliis quinque subrotundis, lunulis quoque septem submarginalibus (ultima in finem marginis interni posita) ochraceorufs, lunulisque cyaneis, interioribus fere obsoletis; caudis majoribus et latioribus.
ㅇ mari similis, sed saturatior et litura posticarum latiore.
In a former paper (P. Z. S. 1877, p. 148), we mentioned having received from Mr. Brown two imperfect specimens of a Papilio allied to $P$. albinus, which we thought might prove to be a distinct species. In the present collection there are more examples of this insect, which confirm this opinion; and we have therefore given it a specific name.

It differs from $P$. albinus in several important points : the posterior wings are more elongated, and the tails longer and broader; the
straw-coloured patch crossing the middle of the secondaries is much narrower, especially towards the inner margin, which it reaches in $P$. cilix; the outer margin of this patch is convex between the veins instead of concave; and the interior margin of the same patch is straight instead of curved ; there is also a bright orange spot on the inner margin near the anal angle, and a second smaller one just beyond it. The female has the outer half of the patch on the secondaries of a dirty yellow colour, while the inner portion is nearly white. Our specimens are from New Ireland.

## Papilio oritas, n. sp.

d. Exp. $5 \cdot 2$ in. P. ormeni simillimus, sed posticis, presertim ad ramum medianum tertium magis elongutis, litura grisea aream mediam occupunte majore et margine introrsum recto nec concavo diversa: subtus posticarum lunula secunda apud angulum analem ochracea, serieque interiore lunularum cyanearum magis distinctis.
ㅇ mari similis, sed alis obscurioribus et squamis sparsis croceis tectis, anticarum fascia subapicali croceo tincta presertim marginem externum versus; posticarum margine interno litura grisea eodem colore picto: subtus lunulis septem ochraceo-rufis, aliis fere obsoletis interioribus cyaneo notatis.
We have now received four examples of this Papilio, three males and a female, from New Ireland. It is nearly allied to $P$. ormenus, from which, however, it differs in the following particulars:-The secondaries are much elongated, especially at the termination of the third median branch, where it is almost caudate; the inner margin of the grey patch on the secondaries in the male is straight instead of curved.

The female is like the male; but the wings are brown and covered with scattered scales of dull orange; the subapical band of spots crossing the primaries, with the exception of the spot nearest the costa, is tinged with the same colour ; the interior margin of the grey patch is convex instead of concave, and towards its edge at the anal angle is rusty yellow; it has likewise a series of seven submarginal lunules of the same colour.

Papilio paron, n. sp.
Exp. $3 \cdot 3 \mathrm{in}$. P. parmato similis sed alis magis productis, anticis fasciola alba obliqua ultra cellulam minore, et fascia submaryinali externa paulo latiore; posticis, griseo angulum analem versus an. gustiore: subtus croceus albo tincto, fasciola in costam per fasciam transversam mediam crocea eunte, tribus lunulis valde conspicuis eodem colore, ad terminum ejus, angulum analem versus, colove rubro omnino absente. Antennis nigris, prothorace croceo.
This is a very distinct species, and, though similar to P. parmatus in the markings of the upper surface, may readily be distinguished from it by having three strongly marked orange spots at the end of the outer transverse black band towards the anal angle; and it has also the band itself towards the costa marked with the same colour,


Fig.1.


Fig. 3.

instead of with the red which is so conspicuous in P. parmatus. Our specimens are from New Ireland.

Papilio browni, n. sp.
Exp. 4 in. P. wallacei similis, sed paulo obscurior, anticis maculis intra cellulam majoribus, ea ad basin viridissima, duabus interioribus linere submedianc anyustioribus, maculis submarginalibus fere obsoletis; posticarum macula basali intra cellulam carente: subtus anticis maculis virescentibus et colore purpurascente in dimidio apicali absentibus; posticis maculis basalibus viridissimis, ea intra cellulam minutissima (fere obsoleta), lunulis rubris angulum analem versus majoribus.
We have received a single female of this insect from New Ireland. The differences indicated in the foregoing description point out its specific distinctness from its close ally P. wallacei. Mr. Hewitson's figure of this latter species is taken from a New-Guinea specimen, and accurately agrees with an example sent us by Dr. Meyer, obtained by him in the same island (cf. Kirsch, Mitth. d. k. zool. Mus. zu Dresden, Heft ii. p. 113).
8. Observations on the Characters of the Echinoidea-II. On the Species of the genus Tripneustes, Agassiz. By F. Jeffrey Bell, B.A. Magdalen College, Oxford, Zoological Department, British Museum, F.Z.S.
[Received June 16, 1878.]
(Plate XLIX.)
It is with the greatest regret that $I$, in laying before the Society a few observations on another genus of the Echinoidea, find myself compelled at the outset to offer some remarks on the nomenclature adopted by Prof. Alex. Agassiz. No one who is engaged in the study of these complex and difficult forms can do otherwise than feel that he owes a great deal to the acuteness of the talented American naturalist ; and his work will perhaps gain in value when it has been more subjected to working criticism than it has hitherto been.

As to the name which should be applied to the genus, Prof. Agassiz prefers to use the name Hipponoë (Gray) in place of Tripneustes (Agassiz) ; and he gives for this course reasons which I think deserve to be reprinted :-"In retaining the name Hipponoë of Gray, to which objections will undoubtedly be raised on the ground of Hipponoa having been before used by Audouin ${ }^{1}$, and from the fact of the name alone appearing without further indications of its connexion, I am simply carrying out the principle that Hipponoë and Hipponoa

[^53]are two very different ${ }^{1}$ words, and that when specimens are accessible which have sersed as basis for any systematic work, their results should be accepted when correct, even when they upset a nomenclature generally recognized'" ('Revision of the Echini’ p. 301).

Let us now see the extent of the "appearance" of this name. In the year 1810 there was published the 42 nd edition of the 'Synopsis of the Contents of the British Museum ;' and on page 65 we find a list of the genera of the family of the 'Echinidæ,' among which stands the name Hipponoë. All that we have here is a mere list, with numbers appended to indicate the table-cases in which the specimens were to be found, and that under an arrangement long since altered: it is hardly worth while to inquire when; for in the year 1841, which (although apparently by a slip) is the year ascribed by Gray himself ${ }^{2}$ to the publication (if so it may be called) of his name Hipponoë, Louis Agassiz put out, and thus defined, the name Tripneustes:-
" Le genre Tripneustes est caractérisé par trois rangées verticales et parallèles de doubles pores dans chaque demi-aire ambulacraire et par une rangée principale de tubercules aux bords internes des plaques interambulacraires. La collerette des piquans est très-développée et la baguette fortement sillonnée d'un bout à l'autre. Ces Oursins ont de profondes entailles au pourtour de l'ouverture inférieure du test. Il se pourrait que ce genre coincidàt avec le genre Hipponoè de Gray, qui n'est point décrit, mais simplement cité dans le Catalogue du Musée Britannique. Dans ce cas, le nom de M. Gray devrait être préféré au mien" ${ }^{3}$.

It has been a matter of some great difficulty to make out the history of this name. In the Bibliographical list of Alex. Agassiz ('Revision of the Echini'), the only references appended to the name Tripneustes are, "Int. Mon. Scut." (sic) and "C. R. Ann. Sc. Nat. vi.." The second reference is intelligible enough ; and the first obviously refers to the 'Monographie des Scutelles,' published in 1841 ; but it is obvious that the Introduction, which deals with the "groupe des Scutelles en général," would only refer in the most incidental manner to so distant a form as Tripneustes; and it would have been convenient if Prof. Alex. Agassiz had given the page on which his father refers to this form: I have searched the pages of the Introduction in vain. Prof. Louis Agassiz seems to have believed that he first used it, definitely at any rate, in the preface to Valentin's 'Anatomie du genre Echinus' (cf. ' Nomina systematica generum Echinodermatum,' where we find Tripneustes, Agass. Monogr. Echin. $4^{e}$ livr. 1841).

Since writing the above, which I let stand for the purpose of giving an idea of the difficulties which are found in our way, there has come into my hands an unbound copy of the four parts of the 'Monographies d'Echinodermes,' by which I find that in the 2de livraison, which contained the 'Monographie des Scutelles,' there was

[^54]published a short essay entitled 'Observations sur les progrès récens de l'histoire naturelle des Échinodermes;' and there, on its seventh page, we find these words:-"Dans un travail encore inédit sur les espèces vivantes de l'ancien genre Echinus, travail que je me propose de publier prochainement, j'ai établi les coupes suivantes, dont je me bornerai à citer ici les types ; ...... . Tripneustes (E. ventricosus) "...... I do not think that there is any ueed to particularize such a method of detailing the history of a name in a work which is entitled a 'Revision;' but I have thought it right, while giving an account of Prof. Alex. Agassiz's method of working out his subject, to give all the material necessary for other naturalists, who desire to investigate for themselves the "matter in question. That there wạs some good cause for confusion is evident from the fact that no less eminent a naturalist, and careful a writer than Prof. E. von Martens put out the synonymy thus :-"Tripneustes, Ag. 1847; Hipponoë, Gray, 1841; non Hipponoë, Audouin et Milne-Edwards, 1834 (Annelid)" ${ }^{1}$. It will now be possible to write the synonymy thus:-

Tripneustes, L. Agassiz, 1841 : p. viii of preface to Valentin's Anat. du genre Echinus. Hipponoe, Gray, 1855: P. Z. S. 1855, p. 36. Heliechinus, Girard, Proc. Boston Soc. of Nat. Hist. iii. p. 364 (fide Agassiz) ${ }^{2}$.

Having now dealt at an almost wearisome length with the vexed and vexatious question of the name proper to this genus, it is time to pass to the consideration of the species of which it is made up. In the 'Revision' three are recognized:-T. depressus, A. Ag., T. esculentus, Leske (this appears to be the correct name for $E$. ventricosus, Lamk.); and T. variegatus, Leske. I now come to some observations on the specific name variegatus; and I will put them briefly thus:-
(1) The name variegatus is wever used by any writer on the genus Tripneustes subsequent to Leske and prior to Alex. Agassiz.
(2) The names synonymous with it in the opinion of Prof. Agassiz, sardica and angulosa, are also used by Leske : the former has been applied by Lamarck, de Blainville, Des Moulins, L. Agassiz, and Dujardin and Hupé, among others; while angulosa has been used by de Blainville, and by Dujardin and Hupé.
(3) The order in which these forms are described ${ }^{3}$ will be shown by stating the pages on which they are found:-Cidaris angulosa, p. 92; Ciduris sardica, p. 146 ; Cidaris variegatus, p. 1494.

It is obvious that the name which must be used is angulosus; as to the other synonyms given by Agassiz in his list, they all appear to include forms which belong to this somewhat variable and widely distributed species.

The first species of the three, depressus, which has been found on
${ }_{2}^{1}$ Archiv für Naturges. xxxii. p. 160.
${ }^{2}$ Cf. Desor, 'Synopsis des Échinides fossiles,' Paris, 1858, p. 132.
${ }^{3}$ Additamenta ad Kleinii dispositionem Echinodermatum. N. G. Leske. Lipsiae mpcclexvin.
${ }^{4}$ Variegata is stated (Rev. Ech. p. 135) to be described on p. 85 of Leske's Additamenta : p. 85 is occupied by part of the description of T. saxatilis; and the word variegata is not to be found on it!

Proc. Zool. Soc.-1879, No. XLII.
the eastern coast of America, was first described by Alex. Agassiz, and is distinguished by its form, its small anal system, and the presence of large plates on the buccal membrane, at the point where this structure unites with the test. In his definition of the form ${ }^{1}$, Agassiz states that " the anal system and the actinostome are comparatively smaller in the West Iudian species." In support of this statement he gives, however, only one set of measurements for T. depressus; but they hardly bear out his proposition, inasmuch as in the specimen described by him, which had a long diameter of 127 mm ., the anal system measured 9 mm . (giving a percentage value of $7 \cdot 08$ ), whereas the four values to be gained from his measurement of $H$. esculenta are respectively 15, $9 \cdot 2,8 \cdot 1$, and $7 \cdot 9$. The single specimen of T. depressus in the possession of the British Museum gives a percentage value of 6.6 (the anal system measuring 8 mm . and the long diameter 120 mm .). We might, indeed, imagine that a "than" had dropped out in the sentence just quoted, were it not that it does as it stands state fairly enough the comparative relations presented by the actinostome in the two forms therein mentioned. To this structure we will now turn. In Prof. Agassiz's specimens the actinal system measured 29 mm . (percentage value 22.8 ) in $H$. depressa, and 26.2 mm . (percentage value $22 \cdot 2$ ) in the largest specimen of $H$. esculenta of which he gives the measurements. The differences here are indeed not very great, but, such as they are, are evidence against Prof. Agassiz. As, however, my remarks are based rather on what I have been able to observe in the specimens in the national collection than on deductions from Prof. Agassiz's measurements, I am able to give in my adhesion to the statement already quoted, that the actinostome is smaller in the West-Indian species; for I find that while the British Museum specimen of T. depressus gives a percentage value of 25 for the actinostome, that of 'T. esculentus does not exceed 23.2 , and may fall as low as $18^{\circ} 8$ per cent.
T. esculentus and T. angulosus.-The diagnoses of Prof. Alex. Agassiz are notoriously difficult; but, so far as an attentive study of his remarks on these two species are of value, they appear to me to be convertible into the following propositions:-

The species $T$. angulosus is distinguished from the West-Indian $T$. esculentus by the following points:
(i.) The tubercles are smaller in size and less in number.
(ii.) The anal system is comparatively very large.
(iii.) The abactinal system is more circular and less pentagonal, owing to the smaller size of the genital plates.
(iv.) The poriferous zone is much narrower.
(v.) The actinostome is larger.
(vi.) The spines are much more slender.
(vii.) The anal plates are smaller and more numerous.

The descriptions are marred by a very remarkable misprint, which states in effect that the specimens of angulosus measured by Prof. Agassiz have a height nearly twice as great as their long ${ }^{1}$ Revision of the Echini, p. 500.
diameter. Taking note of this lapse, we will first consider those statements regarding the species in which the results to be gained from an examination of the British-Museum specimens are not in complete accordance with the deductions of Prof. Agassiz :-
(1) Comparative breadth of the poriferous zone.-Prof. Agassiz states (p. 501, s. v. H. variegata) that "the poriferous zone is also much narrower." As I found that my own measurements reversed the relation, and led me to the conclusion that it was in T. esculentus that the zones were narrower, I have been at the trouble of reducing the figures in the 'Revision' to a percentage value; and I find them to be

For " $H$. esculenta," $10,8 \cdot 3,8 \cdot 9,7 \cdot 7$.
For " $H$. variegata," $9 \cdot 6,8,7$.
Pruned of its epithet " much" the statement of Agassiz is supported by his data. The British-Museum specimens, which I have measured, do not exhibit so great a range of variation in the width of the poriferous zone, as may be seen from the appended list:-
T. angulosus, $8,8 \cdot 2,8 \cdot 2,8 \cdot 6,8 \cdot 9,9,9$.
T. esculentus, $7 \cdot 8,8,8 \cdot 4,8 \cdot 5$.

These observations indicate that the poriferous zones are rather narrower in T. esculentus than in T. angulosus; but they really run so close that it seems to me that it is impossible to find in this character any constant or valuable point by which the two species may be distinguished.
(2) Characters of the actinostome.-The relative size of the actinostome in Tripneustes angulosus as compared with that of T. esculentus is one of the few points of difference to which it is, as a rule, easy to point. In connexion with it there is another character, which it is perhaps safest to speak of as a tendency: in T. angulosus the actinal surface is, as a rule, perfectly flat, and the actinostome is flush with it, whereas in T. esculentus that same surface is ordinarily a little swollen, and the actinostome is placed in a shallow concavity.
(3) The anal system.-It is interesting to compare the data afforded by the specimens of T. esculentus in the British Museum with those given by Prof. Agassiz. These latter are respectively 7.9, $8 \cdot 1,9 \cdot 1,9 \cdot 2$; those which are now given in the Table appended are $6 \cdot 6,7,7 \cdot 4$, and 8 ; and they are to the point as leading us to insist a little more strongly on the comparatively smaller size of the anal system in T. esculentus than we should be justified in doing from a knowledge of Prof. Agassiz's measurements alone.
(4) Difference in the size and number of the tubercles.-This appears to be a good character; but we must insist upon the fact that specimens of $T$. esculentus will be met with which have the median primary tubercles of the abactinal surface largely absorbed, while, on the other hand, there is in the Museum a young specimen which in the characters of its actinal and abactinal systems approximates to T'. angulosus, but in which we find considerably well developed tubercles in the median spaces of the interambulacral areas. In
addition to this it is to be borne in mind that there is now valuable evidence as to the fact that tubercles may, and do, undergo absorption ${ }^{1}$; so that we must not insist upon this character, where others point to the contrary species as being in our hands.
(5) Ocular plates.-I had hoped that these structures would present some constancy of arrangement, which would be of assistance in the discrimination of the species, inasmuch as in the great majority of specimens of $T$. esculentus two only of the ocular plates reach to the anal system (or, in other words, are not shut out from it by the meeting of the edges of the genital plates ): thus of six examples all but one presented the arrangement just described, while the sixth had four ocular plates directly adjacent to the anal system. T. angzlosus presented no such constancy; for out of nine examples there were five that had two plates touching the anal system, while the others had three plates occupying a similar position. No conclusions can, therefore, be drawn from this character.

Characteristic as is the arrangement of the pores in Tripneustes, it is only of assistance in the definition of the genus; when we come to any close examination we find, as indeed we might expect from what we know as to the mode of their development, that the arrangement of the pairs of pores with relation to one another varies considerably. I have noticed in large specimens of T. esculentus that the inner row of pores is quite regular, while the outer row is, as compared with it, irregular ; in the smallest specimens the two flanking rows of pores exhibit very remarkable regularity, following one another in quite straight lines.

The specimens exhibiting a pentagonal aspect come in very large quantities from the Red Sea; but there is in the Museum a specimen from the Philippines in which this form of test is just as well marked as in any Red-Sea specimen.

There are some slight differences in the characters of the component parts of the dentary apparatus (lantern of Aristotle), which I will now proceed to indicate:-

In T. angulosus the epiphysis is arched and its upper edge is bevelled; the tooth is connected with the alveolus by delicate, but not very short, ascending and descending processes; the rotulæ are short and broad; and the radii end in two short processes.

In T. depressus the epiphyses are arched in very much the same manner as in T. angulosus; the inferior ascending processes are of much the same character, but the superior processes are much shorter ; the radius is broadened out at its free end, but there is only a slight indentation at its extreme edge.

In T. esculentus the epiphysis is less strongly arched, and its upper edge is not so sharply bevelled; the tooth is connected with its alveolus by short pieces, which, above, are set nearly perpendicular to it; the inferior ones are only just seen through the triangular space, or, in other words, extend hardly at all upwards; the rotulæ are rather more delicate ; and the free end of the radius is distinctly

[^55]bifurcate, so that the two processes thereby formed are longer than in T. angulosus.

The species of the genus may now be briefly defined :-
T. anyulosus.-Test varying greatly in form and colour, the spines short and generally white; in the majority of specimens there are well-marked bare spaces in both ambulacral and interambulacral areas; there are distinct though delicate and short ascending and descending processes connecting each tooth with its alveolus; and the radii terminate in two shorter processes. The poriferous zones are wider, the actinal system larger, and the anal and abactinal systems more extensive than in T'. esculentus. The species has been found in the Red Sea, Mauritius, the Cape of Good Hope, Rodriguez, the Philippines, and at Cayenne.
T. esculentus.-The test is generally rounded and more constantly white or pinkish in colour; the spines, which are white, are longer than in T. angulosus; and the median spaces in the ambulacral and interambulacral areas are ordinarily occupied by tubercles of some size; the pieces connecting each tooth with the alveolus are shorter and more horizontal in direction; and the two processes of the radii are longer than in T. angulosus, while the poriferous zones are narrower, the actinal system smaller, and the anal and abactinal systems less extensive than in T. angulosus.

As I have only seen one specimen of T. depressus, it will perhaps be best to leave the statements which I made regarding it as they stand in the body of the paper.

I append a list of the localities from which the Trustees of the British Museum have received specimens.

Tripneustes angulosus, Leske.
a. Gulf of Suez ; with some spines; pentagonal in shape.
b. Red Sea.
c. "Mauritius."
d. "Isle of France ;" with spines.
e. Cape of Good Hope ; with spines.
$f$. Isle of Masiate.
g. Philippines.
h. Reef of Oomaga; with spines.
i. Rodriguez ; with spines.
j. Cayenne ${ }^{1}$.

Tripneustes esculentus.
a. Nassau, New Providence, W. I.
b. West Indies; with spines.

## Tripneustes depressus.

$a$. Gulf of California; with spines.

[^56]Measurements of Tripneustes esculentus.

|  | Locality. |  | Percentage value of |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| No. |  |  | Height. | Abactinal system. | Anal system. | Actinal system. | Poriferous. zone. |
| 1. | West Indies | 68 | 51.4 | $12 \cdot 5$ | 6.6 | 25 | $\ldots$ |
| 2. | Nassau (New Providence) | 141 | 63.8 | 14.9 | 7 | 18.8 | 7.8 |
| 3. | Ditto .................. | 148 | 50 | 135 | 7.4 | 19 | $8 \cdot 4$ |
| 4. | ? | 100 | 45 | $12 \cdot 2$ |  | $23 \cdot 2$ | 85 |
| 5. | ? | 110 | 563 | 163 | 8 | 23 | 8 |
| 6. | A. Ag. $\mathrm{i}^{1}{ }^{1}$ | 28.5 | $53 \cdot 3$ | 203 | $10 \cdot 5$ | 35 | $10 \cdot 1$ |
| 7. | A. Ag. iv. ${ }^{1}$........... | 118 | 56.7 | 16 | $9 \cdot 2$ | 22.2 | 7.7 |

Measurements of Tripneustes anyulosus.

| No. | Locality. | $\begin{array}{\|c} \text { Abso- } \\ \text { lute } \\ \text { diam. } \\ \text { in } \\ \text { millims. } \end{array}$ | Percentage ralue of |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  | Height. | $\begin{aligned} & \text { Abac- } \\ & \text { tinal } \\ & \text { system. } \end{aligned}$ | $\begin{gathered} \text { Anal } \\ \text { system. } \end{gathered}$ | Actinal暗tem | Pori- <br> ferous <br> zone. |
| 1. | Masbate | 29 | 55 | 17.25 | $8 \cdot 6$ | 34.5 | $8 \cdot 6$ |
| 2. | Masbate | 67 | 49 | 16.4 | ..... | 298 | $8 \cdot 2$ |
| 3. | Masbate | 77 | $54 \cdot 5$ | 15.5 |  | 24.6 | 9 |
| 4. | Gulf of Suez ......... | 89 | 57.2 | 157 | 10 | $25 \cdot 3$ | 8 |
| 5. | Gulf of Suez ......... | 100 | 56 | 18.5 | 10 | 26 | 9 |
| 6. | Gulf of Suez ........ | 109 | 53.2 | 17.4 | 105 | 26.2 | $8 \times 2$ |
| 7. | Cayenue... | 58 | 60 | 14.6 |  | 28.4 | 95 |
| 8. | ? | 95 | . 52.6 | 17.9 | 7.9 | 25.2 | 9.4 |

## EXPLANATION OF PLATE XLIX.

## Dentary Apparatus of Tripneustes.

Fig. 1. A pyramid of T. angulosus, showing $d$, the tooth, $e$, the epiphysis.
2. Ditto of T. esculentus.
3. Ditto of T. depressus.
$1 a$. Side view of alveolus of a pyramid of T. angulosus, with $e$, the epiphysis, $d$, the tooth.
$2 a$. Ditto of T. esculentus.
$3 a$. Ditto of T. deprcssus.
$1 b, 2 b, 3 b$. Rotulæ of the three species.
$1 c, 2 c, 3 c$. Side view of radii.
$1 d, 2 d, 3 d$. Free terminal portion of the radii.

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## NOTICE.

According to present arrangements the ' Proceedings' are issued in four parts, as follows:-

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| II. | " | " | " | March and April, on August 1st. |
| :---: | :---: | :---: | :---: | :---: |
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November 18, 1879.
Prof. W. H. Flower, LL.D., F.R.S., President, in the Chair.
The Secretary read the following reports on the additions made to the Society's Menagerie during the months of June, July, August, and September $1879:-$

The total number of registered additions to the Society's Menagerie during the month of June was 192, of which 38 were by birth, 54 by presentation, 78 by purchase, 21 were received on deposit, and 1 by exchange. The total number of departures during the same period by death and removals was 119.

The most noticeable additions during the month of June were as follows:-

1. A Spotted-billed Toucamet (Selenidera maculirostris), from Rio, Brazil, purchased June 14.

The receipt of this specimen, which is the first of this Toucan that has reached us, has raised the number of species of the group now represented in our collection to seven, namely :-

1. Toco Toucan, Ramphastos toco.
2. Red-billed Toucan, Ramphastos erylhrorhynchus.
3. Sulphur-and-white-breasted Toucan, Ramphastos vitellinus.
4. Cuvier's Toucan, Ramphastos cuvieri.
5. Ariel Toucan, Ramphastos ariel.
6. Sulphur-breasted Toucan, Ramphastos carinatus.
7. Spotted-billed Toucamet, Selenidera maculirostris.
8. Two Tuatera Lizards (Sphenodon punctatus ${ }^{1}$ ), purchased June 24th.

These specimens were obtained from the island of "Karewa," a barren scoria rock off the harbour of Tauranga, Bay of Plenty, New Zealand, by Captain Fairchild, of the Government steamer 'Himemoa,' about Dec. 1 to 15, 1878, and were brought to this country by Mr. Josiah Martin, of Auckland, New Zealand.

Sphenodon punctatus appears to be still found in several of the rocky islets in the Bay of Plenty, whereas the second species of Tuatera (Sphenodon guentheri, Buller, Trans. N. Z. Irst. ix. p. 324) seems to be confined to the Brothers Islands in Cook's Straits.

The registered additions to the Society's Menagerie during the month of July were 109 in number; of these 45 were acquired by presentation, 35 by purchase, 5 by exchange, 17 by birth, and 7 were received on deposit. The total number of departures during the same period by death and removals was 112.

The most noticeable additions during the month were:-

1. A Funereal or Yellow-eared Cockatoo (Calyptorhynchus fune-
${ }^{1}$ Dr. Gray, when he showed the identity of Hatteria and Sphenodon (Ann. N. H. ser. 4, vol. iii. p. 168), made the latter term neuter, and called this animal Sphenodon punctatum. But ódive is simply an old form of $\delta \delta o v s$, and is properly masculine.

Proc. Zool. Soc.-1879, No. XLIII.
reus), from New South Wales, purchased July 16th, being the first example of this fine Parrot that has reached us alive.
2. A young pair of the Mule Deer of North America (Cervus macrotis), obtained through the valuable assistance of Dr. J. D. Caton, C.M.Z.S., and received July 18th. These Deer were the pets of Messrs. H. H. Carter and E. N. Carter, of Wyoming Territory, U.S.A., and were kindly parted with in aid of the Society's efforts to introduce this remarkable species of Deer into Earope.

The total number of registered additions to the Society's Menagerie during the month of August was 137; of these 54 were acquired by presentation, 39 by purchase, 23 by birth, 13 were received on deposit, and 8 in exchange. The total number of departures during the same period by death and removals was 115.

The most noticeable additions during the month were:-

1. A Bush-Dog (Icticyon venaticus), from British Guiana, presented by J. E. Tinné, Esq., August 20th.

Mr. T'inné has kindly sent me the following notes upon this peculiar animal, which is quite new to the collection :-
" The Bush-Dog came from Dunoon, on the Hyama Creek, a tributary of the Demerara river, British Guiana. Dunoon is just above the Sand IIills, and is a wood-cutting block of high land, covered with wallaba, green-heart, and mora trees. The mother was shot by our tenant Señor Lopez de Faubra on the creek; and he secured a pair of the puppies for me, of which one unfortunately died in Georgetown before I left the colony last May. I fed them on raw meat. I believe these animals hunt in packs by scent, and are exceedingly savage; they take to the water readily. They are very seldom seen, and never frequent the low coast-lands, where our sugar-estates lie."
2. An Indian Otter (apparently Lutra nair), from Rangoon, purchased August 27th.

The total number of registered additions to the Society's Menagerie during the month of September was 93 ; of these 53 were acquired by presentation, 24 by purchase, 1 by exchange, 2 were bred in the Gardens, and 13 were received on deposit. The total number of departures during the same period by death and removals was 91.

The following extracts from a letter addressed to the Secretary by Mr. Henry O. Forbes, dated "Kosala, Bantam, W. Java, July 27, 1879, were read:-
"The following note as to the distribution of the Badger-headed Mydaus (Mydaus meliceps), called by the Sundanese "Sigoeng" (Dutch spelling), may not be without interest.
"Horsfield says that this species ' is confined exclusively to those mountains which have an elevation of more than 7000 feet above the surface of the ocean. There it occurs with the same regularity as
many plants. The long extended surface of Java, abounding with isolated volcanoes with conical points which exceed this elevation, affords many places favourable to its resort.'
"My present residence is about 2000 feet above the sea. Many, many times, especially in the evening just after dusk, the Mydaus has discovered its proximity to us by its extremely disagreeable and peculiar odour. So powerful indeed is this that natives attempting. to catch these animals, often fall down insensible if struck by the discharge from their anal battery. Even at a distance of half a mile and more the stink, as I must call it, permeates the atmosphere so thickly that it is plainly discernible by the taste. None of the mountains in this neighbourhood rise over 4000 feet. I have found the burrows of the Mydaus at 2400 feet. At Tjipanas (Bantam), at an elevation of 850 feet, it is abundantly to be found-at Djasinga also, which is lower still, as well as at Buitenzorg, 750 feet above sea-level. It has also been found in considerable numbers at lower elevations, between Djasinga and the coast. I am informed, but cannot vouch for its being a fact, that its eastward limit is Cheribon. From this it would appear that the habitat of the Mydaus is now much lower than in the time of Horsfield, if his observation was correct. Sir Charles Lyell ${ }^{1}$ thus explains its strange distribution :' Before the island was peopled by man, by whom their numbers are now thinned, they may occasionally have multiplied, so as to be forced to collect together and migrate, in which case, notwithstandthe slowness of their motions, some few would succeed in reaching another mountain some 20 or even 50 miles distant; for although the climate of the hot intervening plains would be unfavourable to them, they might support it for a time, and would find there abundance of iusects, on which they feed.'
"Now that the forests are being more and more cut down one would have expected no downward movement, at least of this peculiar animal, which is as much persecuted as ever. The temperature of Buitenzorg, for instance, is not many degrees lower than that of the plain in which Bataria stands, and is certainly now warmer than it was in past times, when almost impenetrable forests covered the whole district.
"Therefore to find the Mydaus so frequently at so low an elevation is a fact we have thought worth recording, because either it can sustain a greater degree of heat than was supposed by Horsfield, or it has now accommodated itself to a lower elevation.'"

Mr. Edward R. Alston exhibited, on behalf of Mr. R. G. Wardlaw Ramsay, 67 th Regiment, a few specimens of Mammals from Afghanistan and Burmah. Of these one was an example of Pteromys fimbriatus, Gray, killed on the Peiwar Kotal in July 1879; this species had hitherto been only known from the Himalayas. Another was a Burmese skin of Herpestes auropunctatus, Hodgson

[^58]an animal which is not included in Blyth's posthumsus fauna of that country ${ }^{1}$. On exhibiting a specimen of Paradox'urus musanga (Raffles), Mr. Alston observed that the P. fasciatus of Gray ${ }^{2}$ proved to be a synonym of that well-known species, and had nothing whatever in common with the Viverra fasciata of either Gmelin ${ }^{3}$ or Desmarest ${ }^{4}$. Mr. Wardlaw Ramsay intended to present these specimens to the British Museum.

Mr. Alston also exhibited one of the typical skulls of Tapirus dowi (Gill) ${ }^{5}$, which had been intrusted to him by the authorities of the United-States National Museum, and pointed out the osteological characters which distinguish it from T. bairdi (Gill) ${ }^{6}$. Mr. Alston hoped to be able to fully describe and figure the skull of T. dowi in a future part of Messrs. Godman and Salvin's 'Biologia Centrali-Americana,' but wished now to place on record the fact that the young Tapir from Corinto, which lived in the Society's Gardens under the name of T. bairdi ${ }^{7}$, was really referable to T. dowi, as was also a skull from Volcan Viejo, presented by Mr. Sclater to the British Museum ${ }^{8}$. Mr. Alston further remarked that Dr. Gill had been misinformed as to the young of T. dowi not being spotted, but thought it probable that the adult would prove to want the rufous colour on the cheeks which is characteristic of Baird's Tapir. The range of the two species required further investigation ; but T. dowi might prove to be confined to the Pacific slopes of Guatemala and Nicaragua.

The following extract was read from a letter addressed to the Secretary by Dr. A. B. Meyer, C.M.Z.S.:-
"Concerning the locality of Cervus alfredi, I wrote to my friend Mr. Oscar Bruger, who lived five years in Cebu, and who told me a short time ago, on his return to Europe, that he knew the habitat of this Deer; and I received this answer:-
" ' An Indian friend of mine in Cebu, who lived formerly for years in Samao and Leyte, visited these islands again, and brought an ex-ample of this Deer back from there, and presented it to Mr. Bruger.'"

The Secretary exhibited on behalf of Mr. Rowland Ward a head of a Chamois (Rupicapra tragus) with two pairs of horns, the hinder pair being the smaller. The specimen in question had been purchased by Captain Towneley Parker at Nuremberg.

[^59]Prof. Flower exhibited the skull of a Beluga, or White Whale, Delphinapterus leucas (Pallas), which has been presented by His Grace the Duke of Sutherland to the Museum of the Royal College of Surgeons, and made the following remarks:-

As this cetacean has been but rarely observed in the British seas, and as there is but one known instance in which a specimen has been taken alive and authenticated by preservation of its remains ${ }^{1}$, the circumstances relating to its capture, as described in a letter from the Rev. Dr. Joass, of Golspie, may be worth recording:-
"It was found close to the salmon-nets near the Little Ferry, about three miles to the westward of Dunrobin, Sutherlandshire, at ebb tide, on Monday, June 9th, 1879, caught by the tail between two short posts to which a stay-rope of the stake-net was fastened (see fig. 1); and a Salmon of 18 lb . weight, which was supposed to have been the object of its pursuit, was found in front of it. It measured 12 feet 6 inches in length. The tail was 34 inches across, and the flippers 17 inches long. It was a female, and had 20 teeth in the


Fig. 1. The mode in which the Beluga was caught. From a sketch by the Rev. Dr. Joass.
upper jaw and 16 in the lower. The stomach contained a few flakes of fish, which from size and colour might have been Salmon. It was found, on cleaning the skeleton, that in its efforts to escape the Whale had broken its back between the third and fourth lumbar vertebræ; and it had a recent granulating wound on the froutal pad, extending about five inches transversely, and about three inches broad, the lower edge being on a line between the eyes. I have heard since that two days before its capture it was seen off Cracaig by Brora fishermen who were lying at their lines. At first they thought it a human body; as it approached against the ebb, they took it for a ghost! At still closer quarters they saw that it was a living beast of some kind bearing down upon them, and plied it with stones (their spare sinkers), hoping that it would turn aside and not oblige them to leave their ground; but it hardly heeded them, and so they

[^60]dropped their lines and sheared off. It went below near Collieburn, but was up again at Kintradwell, and still heading westward against the tide."

The skeleton is that of a perfectly adult animal, all the epiphyses


Fig. 2. Posterior surface of skull of Deluga, with dislocated atlas. One-third the size of nature.
of the vertebre being united to the bodies. The spine of one lumbar vertebra has been recently broken off close to the base, probably the injury referred to in Dr. Joass's letter.

On examining the skull a most remarkable evidence of old injury and subsequent recovery showed itself. The atlas has been dislocated off the occipital condyles to the left side and tilted a little obliquely, so that the right transverse process is somewhat higher than the left. The dislocation has been complete, the whole of the surfaces formerly in apposition being now free from each other. The prominent inner edge of the left articular surface has passed beyond the outer edge of the condyle and lodged in the hollow which bounds it externally, and so has been prevented by the contraction of the cervical muscles from returning into its place. In this position the bones have become firmly fixed by deposit of new osseous matter around the right side of the joint, and partially covering the exposed right condyle. The aperture for the passage of the spinal cord is narrowed to a chink scarcely three quarters of an inch in greatest transverse diameter. The articular surfaces, as far as they can be seen, have preserved their normal form, and are only slightly rougher than is natural, which clearly shows that the dislocation was traumatic, and not occasioned by disease of the joint. Indeed there is no evidence of
any previous disease in this or any other part of the vertebral column. The formation of new bone, resulting in ankylosis, is what might naturally be expected to occur as the consequence of such an injury, and is the usual sequence of dislocation of the atlas, when not immediately fatal, in the human subject.

In the present case it is difficult to imagine how such an accident can have been occasioned, as in the case of an aquatic animal there is no possibility of a fall on the head, the common cause of such dislocations. Even a violent collision of the head against a rock or ship can scarcely have produced such displacement, in the case of an animal floating freely in the water, unless there were some counterpressure causing resistance on the part of the trunk. The animal certainly had received a blow on the fore part of the head, as at about three inches from the apex of the rostrum, on the right side, there is a roughened surface on which new bone has been thrown out, very probably at the same date as that at the occiput, and long antecedent to the recent wound observed at the time of its capture.

However the injury may have been brought about, the specimen affords a remarkable illustration of recuperative power, as the laceration of all the parts around the articulation, and effusion of blood from the plexus surrounding the cord, must have been considerable, and the ability to pursue and capture living prey must have been, for a time at least, greatly interfered with. The spinal cord itself being of comparatively small diameter in proportion to the size of the aperture through which it passes, seems to have escaped serious injury, and to have accommodated itself to the abnormal position of the surrounding bones. After recovery the head was fixed in a very abnormal position with regard to the body, which may account for the wandering of the animal so far from its natural habitat, and for the facility of its capture.

The following papers were read:-

# 1. Description d'un nouveau Synallaxe péruvien. Par L. Taczanowski, C.M.Z.S. 

[Received July 4, 1879.]
Les deux mâles du dernier envoi de M. Stolzmann, placés dans ma dernière liste sous le nom de S. frontalis (P. Z. S. 1879, p. 230), sont bien différents de cette espèce, et me paraissent appartenir à une forme inédite, à la quelle je propose un nom et une diagnose comme il suit.

Synallaxis fruticicola, sp. not.
Fusca; pileo cinnamomeo, fronte fusca, striga postoculari favicanticervina; alis extus cinnamomeis, cauda rufa; subtus cineracea; gula albida, ventre medio latissime albo, hypochondriis et crisso fusco lavatis. Longit. tota 187-190 mill. (Stolzmann), envergure 190 (Stolzmann), ala 60, cauda 95, rostri a commissura 19, tarsi 22, digiti medii 13.
Cette forme est très-voisine du Synallaxis frontalis, Pelz., mais parfaitement distincte. La couleur du dos est plus olive que dans l'espèce citée. Le dessus de la tête présente plusieurs différences: le gris foncé occupe également le front sur l'espace un peu moins long, le roux de la partie postérieure de la tête est d'une nuance beaucoup plus claire, plus largement disposé et bordé dans sa partie postoculaire d'une large bande fauve roussâtre, bien distincte. Il y a aussi comme dans le $S$. frontalis une raie blanchâtre entre la naissance du bec et le bord supérieur de l'œil. La face dorsale de l'aile est à peu près comme dans l'espèce citée. Tout le dessous du corps est en général plus clair; la gorge un peu plus blanche; le milieu du ventre largement occupé de blanc; le gris de la poitrine et des côtés du cou est beaucoup moins foncé; les côtés du ventre également lavés d'olivâtre.

Le bec est beaucoup plus faible, à arête moins arquée à l'extrémité, d'une couleur cornée noirâtre ; les pattes moins robustes, un peu plus longues, gris-olivâtres. La queue sensiblement plus longue. Iris gris-brunâtre.

Ce Synallaxe ressemble aussi au S. ruficapilla, Vieill., du Brésil, mais il en diffère principalement par le couleur du front.

Deux mâles tués à Tambillo le 7 janvier 1878.

## 2. Description d'un nouveau Tyrannide péruvien. Par L. Taczanowsei, C.M.Z.S.

[Received August 18, 1879.]
Plusieurs exemplaires fournis par M. Jelski de Paltaypampa et de Ropaybamba, en 1872 et 1873, et ensuite par M. Stolzmann de Tambillo paraissent appartenir à une espèce inédite, tant plus que MM. Jelski et Stolzmann ont trouvé de grandes différences dans les habitudes de cet oiseau de celles du Myiarchus nigriceps, avec lequel il se trouve dans les mêmes localités. Je lui propose donc le
nom sous lequel il m'a été dernièrement envoyé, et la diagnose suivante.

## Myiarchus cephalotes, Stolzm. MS.

M. tyrannulo simillimus, sed rostro valde breviore; dorso et capite supra olivaceis; gula pallide cinerea; pectore, abdomine, subcaudalibus subalaribusque favis; alis nigricantibus albido transfasciatis; tertiariorum limbo lato albido; cauda nigricante, rectricibus lateralibus albido marginatis.
Cette forme est la plus voisine du M. tyrannulus (Vieill.), mais elle diffère par le bec beaucoup moins long, moins large et d'une autre forme, en ce que ses lignes latérales sont presque droites, tandis que dans l'espèce brésilienne elles sont légèremẹnt convèxes dans les deux tiers de leur partie basale, ensuite concaves. En coloration elles se ressemblent beaucoup, mais la couleur du dos est dans cette forme péruvienne sensiblement plus olive, bien distincte de la nuance brunâtre foncée du dessus de la tête, tandis que le dos de l'espèce brésilienne est d'une nuance plus brunâtre, moins distincte de la couleur de la calotte, qui est un peu plus brune que celle de cette nonvelle espèce. Le cendré clair de la gorge s'étend moins sur la poitrine; cette dernière et le ventre sont d'un jaune pâle, analogue à celui du M. tyrannulus, les côtés cependant du ventre sont beaucoup moins colorés d'olivâtre que dans l'espèce citée. Les ailes sont noirâtres, traversées de deux larges bandes blanchâtres, formées par les bordures des tectrices, qui dans le MI. tyrannulus sont aussi distinctes mais beaucoup plus foncées; les bordures des rémiges tertiaires sont blanches et assez larges, celles des secondaires fines, verdâtres ou rousses; la queue est à peu près comme dans le M. tyrannulus. Elle diffère aussi de ce dernier oiseau par l'aile sensiblement plus longue et plus aiguë.

Du $M$. nigriceps il se distingue par le bec un peu plus court, et par beaucoup de détails de la coloration, comme la nuance du sommet de la tête et du dos, le gris cendré moins étendu sur la poitrine, le jaune des parties inférieures plus pâle, les bandes alaires, les bordures des tertiaires, etc.
Le bec est noir; les pattes noirâtres; iris brun foncé. ס. Longueur totale 218 mill., envergure 304, aile 87 , queue 87 , tarse 21 ; bec depuis la commissure 22, depuis la narine 12.

우. Longueur totale 204 mill., envergure 304 , aile 90 , queue 92 , tarse 21 ; bec depuis la commissure 22, depuis la narine 12 .
M. Stolzmann dit dans sa lettre 5 avril que cet oiseau, qui habite les mêmes localités avec le M. nigriceps, se tient constamment, comme le Tyrannus melancholicus sur le sommet des arbres élevés, tandis que le $\boldsymbol{M}$. nigriceps reste toujours dans les buissons épais, et seulement par hasard il s'élève plus haut. Le M. cephalotes se distingue au premier coup d'œil par sa tête énorme, qui dans les peaux desséchées perd en grande partie ce caractère. Le M. cephalotes est plus grand; les dimensions prises sur beaucoup d'exemplaires ont donné sa différence de 21 mill. sur la longueur totale et de 41 sur l'envergure, ce qui est considérable dans un oiseau d'une taille pareille.
3. Notice sur quelques Oiseaux du Turkestan.

Par L. Taczanowski, C.M.Z.S.
[Received July 4, 1879.]
Une paire de chardonnerets que M. le capitaine Garlinski vient de fournir du Turkestan au Musée de Varsovie, diffère d'une manière aussi remarquable du chardonneret d'Europe, Carduelis elegans, Steph., que cet oiseau mérite d'être distingué comme une race locale.

Cet chardonneret est beaucoup plus grand, il a à peu près une taille d'un moineau, le bec est plus long et plus robuste. La coloration est en général plus claire. Le brun du dos est beancoup moins foncé et pas aussi uniforme que dans les oiseaux européens, mais nuancé par les bordures plus pâles. Les deux grosses taches pectorales brunes sont beaucoup plus pâles et pas aussi nettement dessinées. Dans le mâle la nuance jaune accompagnant ces taches, qui est l'unique caractère superficiel distinctif parmi les deux sèxes, est dans cette forme asiatique bien visible ì l'extérieur, car elle s'etend beaucoup plus loin vers le bout des plumes, et se trouve même sur des plumes qui n'ont rien de brum,--tandis que dans le chardonneret commun elle est strictement reduite à la base de ces plumes, et complétement cachée par la couleur brune. La bande brune devant ces deux grosses taches pectorales, bien prononcée dans le chardonneret européen, manque complétement dans le mâle du Turkestan, et est à peine dessinée dans la femelle. Les côtés du ventre sont blancs, à peine colorés de brunâtre. Du reste ils ressemblent en tout aux oiseaux d'Europe, si ce n'est que comme l'oiseau est plus grand, plusieurs espaces blancs sont plus volumineux, comme la bande postoculaire, la tache nuchale, etc. Le noir du sommet de la tête est dans la femelle remplacé par la couleur brunâtre pâle; dans le mâle il n'y a que quelques traces de cette nuance (dans le chardonneret d'Europe je n'ai jamais vus de pareille coloration de cette partie). Je propose le nom pour cette forme de Carduelis major et la diagnose suivante :-
C. eleganti simillima, sed valde major, rostro longiore et robustiore, coloribus dilutioribus. す'. Long. alce 87, caude 58, rostri a fronte 15, altit. rostri 9 mill. ㅇ. Long. alwe 86, cauda 58, rostri a fronte 14, altit. rostri 9 mill.
Dans le même envoi du capitaine Garlinski il y a encore plusieurs oiseaux d'un intérêt scientifique. Une femelle d'Accentor alpinus ( Gm .), identique aux oiseaux d'Europe et ne présentant qu'une petite différence dans la coloration génerale un peu plus pâle, et une légère teinte isabelle sur la partie postérieure du dos, du croupion, des scapulaires et du ventre. Les dimensions un peu plus petites (l'aile pliée mesure 94 mill.). Dans la liste des oiseaux du Turkestan, publiée par M. Sewertznw, dans le Journal f. Ornithologie, 1875, p. 177, cette espèce n'est pas comprise, il est donc intéressant de la retrouver dans la partie orientale du Turkestan (district Fergan),
où est probablement la limite orientale de sa distribution geographique. Dans la Sibérie orientale l'espèce est representée par une forme voisine, A. erythropygius, Cab.

Parmi les Buteo ferox (Gm.), il y a un exemplaire tout brun comme cela arrive quelquefois dans le B. vulgaris, plus souvent dans la petite race orientale, B. martini, Hardy, et dans plusieurs autres espèces. La queue de cet individu est cendrée, barrée de 7 raies étroites brunes complètes et d'une large bande terminale presque noire; ces raies sont pâles mais distinctes sur le côté inférieur de la queue. La partie basale de la page externe des primaires est impregnée de cendré; le côté interne de toutes les rémiges est d'un blanc grisâtre, barré de brunâtre.

Il y a deux formes de pigeons, C. livia, L., et C. rupestris, Bp. Ces derniers sont tout-ì-fait comme ceux de la Daourie et du Baical méridional, mais pas comme ceux de la eôte de la mer du Japon. Quant aux premiers, ils sont beaucoup plus forts que les oiseaux de Triest et de l'Algérie, avec lesquels-je les ai comparés: ils ont le bec beaucoup plus fort, ainsi que les pattes et toutes les dimensions; l'aile pliée du mâle ctépasse de 15 mill. cette du mâle de l'Algérie et de 20 l'aile du male de Triest. Dans la coloration il y a quelques petits détails différentiels; et principalement dans les oiseaux du Turkestan la nuance rouge est beaucoup plus forte et plus repandue antour de la gorge, le cendré bleuâtre du dos plus clair, et le blanc du bord de la rectrice externe beaucoup plus pur.

## 4. On a Collection of Birds from the Comoro Islands. By Captain G. E. Shelley.

[Received August 9, 1879.]
Dr. Kirk, H.B.M. Consul-General of Zanzibar, has most kindly forwarded to me a collection of birds from the Comoro Islands, consisting of 186 specimens: 83 were collected in the island of Grand Comoro, and belong to 25 species. Of these, 17 are known to inhabit the coast of Madagascar, 9 the continent of Africa, and 17 are common to the two islands of Grand Comoro and Anjuan (Johanna).

One species of Zosterops appears to be new ; and I therefore name it Z. kirki, in acknowledgment of the assistance rendered to ornithology by Dr. Kirk. The remaining 103 specimens were obtained on the island of Anjuan : these belong to 23 species, three of which are new to that island-Psittacula cana, Tringa subarquata, and Eurystomus glaucurus.

Mr. E. Newton, in a valuable communication to this Society (P. Z. S. 1877, pp. 295-302), on a collection of birds from the Island of Anjuan made by Mr. C. E. Bewsher, appends a most useful table showing the distribution of the species then known to inhabit the islands of the Comoro group and remarks :-" From this
it will be seen that we absolutely know nothing of the avifauna of the Great Comoro."

It is most interesting, therefore, to have received a collection from Grand Comoro, and once more to couple Dr. Kirk's name with the ornithology of this group of islands, which he was one of the first to explore scientifically, an account of his former investigations having been published by Dr. Sclater (Ibis, 1864, p. 292).

In order to render this short communication as serviceable as possible, I have followed Mr. E. Newton's arrangement (P. Z. S. 1877, p. 295), and prefixed a dagger ( $\dagger$ ) to those species which are here recorded for the first time from a new locality, and a star (*) to the species new to this group of islands.
*1. Circus macroscelis, E. Newton.
Circus macroscelis, Sharpe, P. Z. S. 1875, p. 71.
Circus macroscelus, Hartl. Vög. Madag. p. 38 (1877).
?Circus maillardi, E. Newton, P. Z. S. 1877, p. 302.
A single specimen from Grand Comoro agrees perfectly with the description of the type of C. macroscelis, as given by Mr. R. B. Sharpe ( $l . c$. ), in the measurements of the tarsus and in the number of bands on the tail. The specimen unfortunately not having been sexed, I am unable to say for certain whether this is the female of C. maillardi or not ; but I incline to Mr. Sharpe's opinion that it is only the hen of that bird.
$\dagger$ 2. Astur pusillus (Gurney).
Scelospizias pusillus, Hartl. Vög. Madag. p. 31.
Accipiter pusillus, E. Newton, P. Z. S. 1877, p. 296.
Two immature specirnens, Grand Comoro.
Adult male and female and an immature bird, Anjuan.
$\delta^{\circ}$ ad. Total length $9 \cdot 7$ inches, wing $5 \cdot 6$, tail $4 \cdot 8$, tarsus $1 \cdot 95$.
우 ad. , 11.5 , 6.4, , $5 \cdot 3$, , 2.05 .
$\dagger 3$. Milvus efgyptius ( Gm 。).
Milvus regyptius, Sharpe, Cat. B. i. p. 320 (1874); Hartl. Vög. Madag. p. 27; E. Newton, P. Z. S. 1877, p. 296.

One adult specimen, Grand Comoro.
$\dagger$. Strix flammea, Linn.
Strix flammea, Sharpe, Cat. B. ii. p. 291 (1875); Hartl. Vög. Madag. p. 52.

Aluco flammea, E. Newton, P. Z. S. 1877, p. 296.
One specimen, Grand Comoro.
$\dagger 5$. Coracopsis comorensis, Peters.
Coracopsis comorensis, Hartl. Vög. Madag. p. 230 ; E. Newton, P.Z.S. 1877, p. 296.

Four specimens, Grand Comoro, and seven from Anjuan.
$\dagger$ 6. Coracopsis barklyi, E. Newton.
Coracopsis barklyi, E. Newton, P. Z.S. 1867, p. 346, pl. 22, 1877, p. 296 ; Hartl. Vög. Madag. p. 231.

One specimen from Grand Comoro and one from Anjuan.
Compared with a specimen of C. barklyi from the Seychelles, I find the Comoro birds slightly darker and the greyish green on the primary coverts and quills almost absent.

Mr. E. Newton was led to the belief that this species had been introduced as a cage-bird from the Seychelles islands, owing to Mr. Bewsher having only met with a single specimen; but now that we know of three examples and from two of the islands, I think that this Parrot should be looked upon as indigenous to the Comoro group.
*7. Psittacula cana (Gm.).
Psittacula cana, Hartl. Vög. Madag. p. 234.
Seven specimens, Anjuan.
Mr. C. E. Bewsher heard of this species from the natives; but as he did not obtain a specimen, it is here recorded for the first time as a native of the Comoro Islands. Hitherto this Love-bird has only been met with in Madagascar, and by Baron von der Decken on the small island of Mafia, south of Zanzibar, where, I presume, it was only an escaped cage-bird.
*8. Leptosoma discolor (Hermm.).
Leptosoma discolor, Sharpe, Ibis, 1871, p. 285 ; Hartl. Vög. Madag. p. 255.
$a, b$. Adult males, and $c, d$, female, Grand Comoro.
e. Immature male, Anjuan.

These agree in their colouring with Madagascar birds; but the specimens from Grand Comoro are remarkably small, as the following measurements will show, but should not in my opinion be separated as specifically distinet.

|  | Entire length. | Wing. | Tail. | Tarsu |
| :---: | :---: | :---: | :---: | :---: |
|  | in. | in. | in. |  |
| ov ad. Madagascar. | $18 \cdot 5$ | 10.0 | $8 \cdot 0$ | $1 \cdot 30$ |
| 才 juv. Madagascar | $16 \cdot 0$ | 9.7 | $8 \cdot 1$ | 1.20 |
| ס̄ juv. Anjuan | $16 \cdot 2$ | $9 \cdot 0$ | $7 \cdot 3$ | $1 \cdot 25$ |
| a. ot ad. Grand Comoro | $15 \cdot 7$ | $9 \cdot 5$ | $7 \cdot 5$ | $1 \cdot 15$ |
| b. $0^{\text {a }} \mathrm{ad}$. Grand Comoro | $15 \cdot 0$ | $8 \cdot 9$ | $7 \cdot 3$ | $1 \cdot 10$ |
| c. ¢. Grand Comoro | $14 \cdot 6$ | $8 \cdot 8$ | $7 \cdot 3$ | $1 \cdot 15$ |
| d. ¢. Grand Comoro | $15 \cdot 0$ | $8 \cdot 5$ | $6 \cdot 8$ | $1 \cdot 15$ |

*9. Eurystomus glaucurus (P. L. S. Müll.).
Eurystomus glaucurus, Sharpe, Ibis, 1871, p. 271.
Eurystomus madagascariensis, Hartl. Vög. Madag. p. 67.
One adult specimen from Anjuan. It agrees perfectly with the Madagascar bird.
10. Corythornis cristata (Linn.).

Corythornis vintsioides, Sharpe, Monogr. Alced. p. 33 (1867); E. Newton, P. Z.S. 1877, p. 297.

Corythornis cristata, Sharpe, Monogr. Alced. p. vi (1871): Hartl. Vög. Madag. p. 78.

Seven specimens, Anjuan.
$\dagger$ 11. Merops superciliosus, Linn.
Merops superciliosus, Hartl. Vög. Madag. p. 81; E. Newton, P.Z.S. 1877, p. 297.

Two specimens from Grand Comoro, and five from Anjuan.
I feel no doubt as to the forms inhabiting the Comoro Islands, Madagascar, and East and South Africa being identical. They are the true M. superciliosus, Limn., and are distinct from the Egyptian and more northern form M. agyptius, Forsk.
*12. Cinnyris notata (P. L. S. Müll.).
Cinnyris notatus, Shelley, Monogr. Sun-birds, pt. ii. (1876).
Nectarinia angladiana, Hartl. Vög. Madag. p. 89.
Five adult males, Grand Comoro.
This species, hitherto only known from Madagascar, appears to be not uncommon in Grand Comoro. Compared with the Madagascar bird I can find no specific difference, though in the specimens before me there is a slight but variable tendency to a blue gloss on the throat and mantle.
13. Cinnyris comorensis, Peters.

Cinnyris comorensis, Shelley, Monogr. Sun-birds, pt. ix. (1879).
Three specimens, Anjuan.
$\dagger$ 14. Zosterops anjuanensis, E. Newton.
Zosterops anjuanensis, E. Newton, P. Z. S. 1877, p. 297, pl. 33. fig. 1.

One specimen from Grand Comoro, and six from Anjuan.
*15. Zosterops kirki, n. sp.
$a, b$. Two specimens, Grand Comoro.
Similis Z. mayottensi sed multo minor et subtus omnino fava, hypochondriis quoque flavis distinguenda.
a. Upper parts, as well as the wing-coverts, olive-yellow, with a rather yellower shade on the upper tail-coverts; sides of the forehead and an eyebrow gamboge-yellow; remainder of the wings dark brown, the feathers margined on the outer webs with olive-yellow and on their inner webs with white; tail dark brown, with the outer webs of the feathers edged with olive-yellow; entire underparts uniform gamboge-yellow. Total length $3 \cdot 7$ inches, culmen $0 \cdot 35$, wing $2 \cdot 1$, tail $1 \cdot 5$, tarsus 0.65 .

I believe the specimen I have here described to be a male, because it is slightly the brighter bird. In $b$ the sides of the crop and the flanks are faintly tinted with olire.
*16. Artamia bicolor (Linn.).
Artamia bicolor, Schl. \& Poll. Faun. Madag. p. 85, pl. 24 (1868). Cyanolanius bicolor, Hartl. Vög. Madag. p. 157 (1877).
One specimen, Grand Comoro.
This is the first occurrence of this species out of Madagascar. The specimen is an adult in most perfect plumage, and gires me no reason to beliere that it had been a caged bird.
t17. Terpsiphone vulpina (E. Newton).
Tchitrea rulpina, E. Newton, P. Z. S. 187\%, p. 298, pl. 33. fis. 2.
Terpsiphone vulpina, Sharpe, Cat. B. iv. p. 353 (1879).
Two specimens from Graid Comoro, and tro from Anjuan.
These specimens are darker than some from Madagascar ; and the character of the elongated crest alluded to by Mr. Sharpe does not seem very strongly pronounced. I do not at present unite the bird to $T$. mutata, as all the specimens sent home have white wings and red tails, whereas in the apparently corresponding stage of the Madagascar bird the long tail-feathers are already white.
18. Edolius forficatus (Linn.).

Dicrurus forficatus, Hartl. Vög. Madag. p. 148 ; E. Newton, P. Z. S. 1877 , p. 297.

Edolius forficatus, Sharpe, Cat. B. iii. p. 254 (1878).
Eleven specimens, Anjuan.
+19. Hypsipetes ourovang (Gm.).
Hypsipetes ourorang, Hartl. Vög. Madag. p. 136 ; E. Nernton, P. Z. S. 1877, p. 299.

Nine specimens from Grand Comoro, and ten from Anjuan.
20. Turdus betrsheri, E. Nerton.

Turdus bewsheri, E. Newton, P. Z. S. 1877, p. 299, pl. 34.
One specimen, Anjuan.
21. Coryus scapulatus, Daud.

Corvus scapulatus, Sharpe, Cat. B. iii. p. 22 (1877) ; Hartl. Vög. Madag. p. 201.

Corvus madagascuriensis, E. Nemton, P. Z. S. 1877, p. 299.
Three specimens, Anjuan.
$\dagger$ 22. Spermestes cucullatus, Swains.
Spermestes cucullatus, E. Newton, P. Z. S. 1877, p. 299.
Seven specimens from Grand Comoro, and two from Anjuan. $\dagger$ 23. Foudia algonde (Poll.).
Ploceus algondae, Schl. \& Poll. Faun. Madag. p. 109, pl. 34 (1868).
Foudia algonde, Hartl. Vög. Madag. p. 216 ; E. Newton, P. Z. S. 1877, p. 300.
Foudia comorensis, Hartl. tom. cit. p. 217.
Seren specimens from Grand Comoro, and nine from Anjuan.
$\dagger 24$. Passer domesticus (Linn.).
Passer domesticus, Hartl. Vög. Madag. p. 401.
Three specimens, Grand Comoro.
25. Columba polleni, Schl.

Columba polleni, Schl. \& Poll. Faun. Madag. p. 112, pl. 35 ; Hartl. Vög. Madag. p. 267; E. Newton, P. Z. S. 1877, p. 300.

Three specimens, Anjuan.
$\dagger$ 26. Chalcoptera tympanistria (Temm.).
Peristera tympanistria, Finsch \& Hartl. Vög. Ost-Afr. p. 558 (1870); Hartl. Vög. Madag. p. 271.

Three specimens, Grand Comoro.
27. Turtur comorensis, E. Newton.
? Turtur aldabranus, Sclat. P. Z. S. 1871, p. 300; Hartl. Vög. Madag. p. 270.

Turtur comorensis, E. Newton, P. Z. S. 1877, p. 300.
Two specimens, Anjuan.
The measurements agree perfectly with those given by Mr. E. Newton for T. comorensis, and not with those of T. aldabranus, Sclat.; otherwise the two species appear to be remarkably similar.
$\dagger$ 28. Turtur capicola (Sundev.).
Turtur capicola, Finsch \& Hartl. Vög. Ost-Afr. p. 548.
? Turtur semitorquatus, Hartl. Vög. Madag. p. 271 ; E. Newton, P. Z. S. 1877, p. 300.

Five specimens, Grand Comoro.
29. Alectrenas sganzini (Verr.).

Alectrcenas syanzini, Hartl. Vög. Madag. p. 260; E. Newton, P. Z. S. 1877, p. 300.

A fine series from both Grand Comoro and Anjuan.
$\dagger 30$. Numida tiarata (Bp.).
Numida mitrata (part.), Elliot, Monogr. Phasianidæ, ii. pl. xli.; Hartl. Vög. Madag. p. 275.

Numida tiarata, E. Newton, P. Z. S. 1877, p. 301.
One specimen, Grand Comoro.
$\dagger$ 31. Ardea gularis, Bosc.
Ardea gularis, Finsch \& Hartl. Vög. Ost-Afr. p. 691 ; Hartl. Vög. Madag. p. 289 ; E. Newton, P. Z. S. 1877, p. 302.

A wing and back of an immature Heron, Grand Comoro, probably belonging to this species.

## 32. Bubulcus ibis (Linn.).

Ardea bubulcus, Finsch \& Hartl. Vög. Ost-Afr. p. 694; Hartl. Vög. Madag. p. 302.

Ardea ibis, E. Newton, P. Z. S. 1877, p. 301.
Three specimens, Anjuan.
$\dagger 33$. Ardetta atricapilla (Afzel.).
Ardea atricapilla, Finsch \& Hartl. Vög. Ost-Afr. p. 701 ; Hartl. Vög. Madag. p. 308.

Butoroides atricapilla, E. Newton, P. Z. S. 1877, p. 301.
One specimen from Grand Comoro and eight from Anjuan.
$\dagger 34$. Numenius pheopus (Linn.).
Numenius phaopus, Finsch \& Hartl. Vög. Ost-Afr. p. 739 ; Hartl. Vög. Madag. p. 322.

One specimen, Grand Comoro.
$\dagger 3 j$. Tringa subarquata (Güld.).
Tringa subarquata, Finsch \& Hartl. Vög. Ost-Afr. p. 761 ; Hartl. Vög. Madag. p. 330.

Two specimens, Anjuan.
$\dagger$ 36. Sterna media, Horsf.
Sterna miedia, Finsch \& Hartl. Vög. Ost-Afr. p. 830 ; H. Saunders, P. Z. S. 1876, p. 655.

Sterna affinis, Rüpp. (nec Horsf.), Hartl. Vög. Madag. p. 382.
Two specimens, Grand Comoro.

## 5. Descriptions of two new Species of African Birds. By Captain G. E. Shelley.

[Received August 19, 1879.]
(Plate L.)
Cerysococcyx flavigularis, n. sp. (Plate L.)
Entire upper parts, as well as the sides of the head and neck, golden green, with a very strong shade of copper or lilac-bronze; two centre tail-feathers uniform fiery copper, the next pair of feathers dark brown glossed with fiery copper, with white ends and a broad white outer margin to the basal three quarters of the outer webs, the remaining three pairs of outer tail-feathers white, with a broad subterminal bar of blackish bronze; quills dark brown, glossed with fiery copper, most strongly so on the outer webs; the inner webs of the quills for about three quarters of their length buff, this colour forming partial bars or notches in the brown of the quills; chin and throat bright yellow, with the sides and a few feathers on the middle of the crop golden green; remainder of the under surface of the body, the thighs, and the under tail-coverts brownish buff, each feather with some four or five wavy narrow bars of bronze; under wing-coverts buff, similarly marked; bill yellow, shaded with horncolour towards the base; legs apparently dark olive, with the soles of the feet yellow. Total length 6 inches, culmen $0 \cdot 7$, wing 3.8 , tail $2 \cdot 8$, tarsus $0 \cdot 6$.

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The fiery copper shading of the upper surface may not be a constant character, as we meet with it, although barely to so great an extent, in some specimens of C. cupreus and C. Klaasi. In my opinion the specimen before me is fully adult: this I infer from the total absence of bars on the upper parts and from the small extent of the barring of the quills. The yellow bill and the barring of the breast not being mere signs of immaturity, are good characters; and the yellow throat, from which I have named the bird, is not met with in any other member of the genus Chrysococcyx. The colouring of the tail is also a well-marked character in this species. In its nearest ally $C$. klaasi, in which there is no white on the four centre tail-feathers, the three outer pairs of tail-feathers are white with fire or six partial narrow dark bars.

In C. flavigularis only the two centre tail-feathers show no white on them, the next pair of feathers haring white tips and a large white patch on their outer webs, and the three outer pairs being white with a dark base and a single dark broad subterminal bar.

I am indebted to the kindness of Dr. Krauss for being able here to describe and figure this beautiful species, which was collected for the Stuttgart Museum at Elmina in Fantee.

The synonymy given by Mr. R. B. Sharpe (P. Z. S. 1873, pp. 588, 593), and his conclusion that only three species of Golden Cuckoo had then been described from Africa, I perfectly agree with; but as regards a portion of the key to the species given by him (P. Z. S. 1873, p. 580) I would propose the following alterations, so as to include the present new species:-

[^61]
## Pogonorhynchus affinis, n. sp.

In size and colouring this species resembles $P$. leucomelas, excepting that the entire forehead and crown are black as in $P$. melanocephalus. In the bill and rictal bristles it resembles $P$. leucomelas, but the tooth on the upper mandible is barely indicated and the culmen between the nostrils is not quite so wide. 'Total length 6.2 inches, culmen $0 \cdot 7$, wing $3 \cdot 15$, tail $2 \cdot 1$, tarsus $0 \cdot 8$.

Notwithstanding the almost entire absence of a tooth on the upper mandible, I cannot conceive this species to be generically distinct from P. leucomelas. The type specimen was collected by Mr. A rnold at Weenen in Natal, and is labelled "Female: iris brown." It is now in my own collection. There is a second specimen in the British Muscum from the same locality.

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6. Note on the Female of Lophophorus sclateri, Jerdon, from Eastern Assam. By Lt.-Colonel H. H. Godwin-Austen, F.Z.S. \&cc.
[Received September 12, 1879.]
(Plate LI.)
As I believe the female of Lophophorus sclateri has never yet been described, I have much pleasure in exhibiting a specimen received lately from Sadya, Eastern Assam, and very kindly sent to me by Capt. C. R. Macgregor, who has thus again aided us to complete our knowledge of another fine species of Pheasant, which Dr. Jerdon was the first to identify as new in 1869. In the Proceedings of the Asiatic Society of Bengal, 1870, p. 61, the description of Lophophorus sclateri appeared; and the discovery was referred to by Mr. Sclater in the 'Proceedings' of this Society for March of the same year, where a figure of the male by Mr. Keulemans is given (P.Z.S. 1870, p. 162, pl. xiv.).

It will at once be seen how very distinct the female of this species is from that of the Monal of the N.W. Himalayas, L. impeyanus, in the pale-coloured rump, white termination of the tail-feathers, and the very different style of coloration of the breast, and it appears somewhat smaller in size.

Descr. Head and back very rich dark umber-brown, each feather of the former with a V-shaped pale ochre mark; each of the latter has a centre line of a richer brown finely mottled towards the margins. A broad extent of the rump and upper tail-coverts are pale ochraceous white, very finely, delicately mottled with dark brown. Tail above rich black, with six or seven narrow whitish bars, and tipped with the same (the countercolouring of male). Shoulder of wing very rich dark chestnut-brown, the shafts pale ochraceous. Primaries rich dark umber; secondaries slightly mottled with brown. Cheeks and throat dark umber, markings like those on the head ; chin white; breast, abdomen, and thighs dull umber, most delicately and finely mottled with pale ochre. Underside of tail black, with narrow white bars. The legs appear to have been of a pale grey and the bill whitish.

Wing $11 \cdot 5$ inches, tail about 8 , tarsus 3 , bill at front $1 \cdot 75$.
7. On some new and rare Spiders from New Zealand, with Characters of four new Genera. By the Rev. O. P. Cambridge, M.A., C.M.Z.S., Hon. Memb. New-Zealand Institute.

> [Received September 24, 1879.]
(Plates LII. \& LIII.)
The Spiders described in the following pages are a portion of various small collections sent to me at different times during the last
few years from New Zealand by Captain F.W.Hutton, and of another collection brought to me from the same region of the world, in 1878, by Mr. A S. Athinson. Those selected for present record are, I believe, all new to science, excepting two species-Robsonia marina (Hector), remarkable for its submarine habits, and Walckenaëra cristata, Bl. The occurrence of this latter Spider is very interesting, as being the first species of an extensive European, North-A merican, and North-Asiatic group as yet found in any part of Australasia. Another Spider now recorded (Episinus antipodianus, sp. n., p. 701) appears to me to indicate the true systematic position of the genus to which it belongs. The genus Episinus, Walck., represented at present by dive or six species only (and those mostly European), has hitherto been included in the family Theridiides ; it has always, however, seemed to me to have little real affinity with the typical Spiders of that group, but to be more nearly allied to the Thomisides, as connected with them through the peculiarly Australasian genus Stephanopis, Cambr. An undoubted species of Episinus having now occurred in New Zealand (where Stephanopis is also found), I have ventured to place the former near to the latter, though (owing to a difference in the number of the tarsal claws, and for other reasons) in a distinct family, Episinides.

## Fam. Theraphosides.

Genus Arbanitis, L. Koch.

## Arbanitis huttonii, sp.n. (Plate LII. fig. 1.)

Adult male, length rather less than $4 \frac{1}{2}$ lines.
This Spider is nearly allied to Nemesia gilliesii, Cambr. (Trans. N. Zeal. Instit. x. p. 281 , pl. x.), resembling it in general appearance, colours, and markings. It may, however, be easily distinguished by its much smaller size. The cephalothorax is darkercoloured. The legs of the first pair are darker, being of a reddish yellow-brown hue, the tibiæ distinctly darker than the rest; the metatarsi also of the first pair are straight, instead of sinuously curved, and shorter than in $N$. gilliesii. When looked at in profile the occiput is more gibbous, as also is the posterior margin of the thoracic indentation. The radial joint of the palpus is very large and of a similarly tumid form, but the external edges of the large chasm (or cleft) on the outer side are not nearly so thickly studded with short spines or denticulations; in fact the denticulæ on the upper edge form only an imperfect single row, whereas those on the corresponding part in $N$. gilliesii are smaller, but much more numerous; on the lower edge they are short, strong, and conical, forming two irregular rows only, and numbering only 18 to 20, whereas in N. gilliesii they are smaller, but densely grouped, and quite past counting. The digital joint has on the upperside numerous, rather obtuse, straight, not very long spines, but all of equal length, with a few on the fore part of the upperside of the radial joint; whereas on the radial joint of $\boldsymbol{N}$.gilliesii there are no spines, and but very few, mingled with numerous hairs and some bristles, on the digital joint. The
palpal organs consist of a bulbous base, produced into an irregular, tapering, somewhat twisted stem, ending in a rather obtuse point, while in $N$. gilliesii the stem is much longer, curved, and drawn out into a much finer point.

A single example of this very interesting and distinct species was received in 1879, from Capt. Hutton, by whom it was found at Dunedin, New Zealand. Although the male cannot be mistaken for that of $N$. gilliesii, if the above differences be carefully noted, it is probable that considerable difficulty may be experienced in distinguishing the females, excepting by the size, if, indeed, this character should prove a constant one. It is more than probable, however, that the trap-door nest, which will certainly be found to belong to it, will prove distinct in some portion or detail of its structure. It is with great pleasure that I confer the name of Capt. Hutton upon this Spider, being indebted to him for a large amount of materials for a Monograph on New-Zealand Spiders, and of which materials I hope to make full use before the expiration of any great length of time.

## Genus Migas, L. Koch.

## Migas distinctus, sp. n. (Plate LII. fig. 2.)

## Length of an immature female $4 \frac{1}{2}$ lines.

Cephalothorax short, oblong-oval, a little longer than broad; anterior extremity broad and truncated, lateral marginal constrictions at the caput very slight; profile of caput rounded, and running off in a straight line from the thoracic fovea or indentation to the hinder extremity of the thorax ; the fovea curved, but not very long, the convexity of the curve being directed forwards. The other indentations are strong; on the upper part of the caput and on the ocular area and clypeus are a few strong bristly hairs of different lengths. The height of the clypeus is about equal to the length of the line formed by the fore-central pair of eyes. The eyes form a rather narrow area, whose transverse diameter is more than three times the length of the longitudinal diameter. All are small, the fore-laterals distinctly the largest, and each is separated from the fore-central on its side by an interval a little exceeding its diameter ; the fore-centrals are separated from each other by a diameter's interval, and are placed on a largish oval, black, slightly tuberculate spot. Each hind-lateral eye is separated from the forelateral on its side by an interval exceeding the diameter of the former; and each hind-central eye is flattened, of a shining pearly lustre, subtriangular, and contiguous to the lateral eye next to it. Taken in two transverse lines, the eyes form two curved rows, of which the anterior has its curve directed backwards and the posterior forwards.

The legs are short, strong, paler than the cephalothorax, furnished with hairs, bristles, and spines; the most noteworthy of the latter form a double row beneath each side of the tibix and metatarsi of the first and second pairs ; the superior terminal claws
are loug, strong, and hooked, with two or three denticulations underneath; the inferior claw has no denticulation, nor is there any scopula beneath the tarsi.

The falces are powerful, nearly vertical, but rather prominent in front; the fore extremities have no spines; the fang is short, but very powerful.

The maxilla are very divergent but straight, with parallel sides, and a short subconical point at the extremity on the inner side. The labium is short-oblong, rounded at its apex, and (with the maxillæ) studded with very short, strong, tooth-like spines; these parts (with the basal joints of the legs) are of a pale dull yellowish hue.

The abdomen is oval, hairy, and projects well over the base of the cephalothorax; it is of a dark, somewhat warm maroon-brown colour, minutely speckled with pale spots, and with several pairs of distinct elongate-oval, oblique spots along the upperside, forming two longitudinal rows, which converge as they run backwards; between these rows the surface is darker than the rest. The spinners (four in number) are dull yellowish, those of the superior pair pointed; the last two joints very short; inferior spinners much the smallest. The sides and underpart of the abdomen are paler than the upperside.

A single example of this Spider was received from Dunedin, New Zealand, where it was found by Captain F. W. Hutton. It may be distinguished readily from Migas paradoxus, L. Koch, by its much smaller and more widely separated eyes, and by the very different colour and pattern of the abdomen.

## Fam. Enyoides.

## Huttonia, gen. nov.

Cephalothorax much longer than broad, roundly truncated at the fore extremity; profile strongly arched, the highest part being at the occiput ; normal grooves and indentations, as well as the constrictions on the lateral margins of the caput, very slight.

Eyes subequal, rather closely grouped, in two very nearly concentric cursed rows, whose convexity is directed backwards, and of which the anterior row is a little the shortest and least curved; the fore-centrals are the largest of the eight, and are seated on a slight tubercular prominence.

Legs not very long, moderately strong, 4, 1,2,3. The femora of the first and second pairs stronger than the rest, and particularly so at the posterior extremity on the upperside. Femoral joints rather unusually long, and of a clavate form. Clothed with hairs and bristles only. Tarsal claws three; those of the third and fourth pairs placed on a small supernumerary articulation or claw-joint. Scopula slight, and only beneath the tarsi and metatarsi of the first and second pairs. Palpi (of the female) without any terminal claw.

Maxillac tolerably long, somewhat tapering, and blunt, pointed at their extremities, gibbous at the base, slightly impressed beyond the middle, and greatly inclined to each other, their points meeting over
the labium, which is long, of a diamond shape, sharp-pointed at the apex and truncated at the base, the apex fitting up close beneath the extremities of the masillæ; sternum oval.

Abdomen of a somewhat cylindric-oval form. Close in front of the spinners, on the underside, is a short transrerse dark fold in the epidermis, which has every appearance of being the external aperture of a special breathing-apparatus; not far in front of this is a much more extensive fold, which, if I mistake not, contains one or two other such apertures; but, in the absence of other examples, I can only speak hesitatingly on this point. Spinners six, short, the superior pair strongest, the inferior pair two-jointed, the terminal joint very short.

## Huttonia palpimanoides, sp. n. (Plate LiI. fig. 3.)

The length of the adult female is rather over 2 lines.
The cephalothorax and falces are of a bright brownish-red colour.
The legs dull orange-yellow, tinged with red-brown.
The upper part of the caput is furnished with numerous strong hairs, and the height of the clypeus is equal to the diameter of one of the fore-central eyes.

The eyes of the posterior row are separated by equal intervals of about the diameter of one of the centrals of that row; the interval between those of the fore-central pair is rather less than a diameter, and each is separated from the fore-lateral eye on its side by a very slight interval. The transverse diameter of the ocular area is about double the length of the longitudinal one.

The superior tarsal claws have a very few denticulations, those on the fourth pair of legs are but three in number. I was unable to see the rest accurately.

The palpi are like the legs in colour ; the digital joints are long, densely clothed on the outer side with numerous black bristly hairs of uniform length, and on the inner side with some longer coarse bristles, some of which are of a spiny nature.

The falces are strong, straight, prominent in front, the profile strongly arched; towards their fore extremity on the inner side is a small group of longish but not very strong teeth, between which and the insertion of the fang are numerous smaller and shorter denticulations. The fang is small and curves closely over the obtuse extremity of the falx.

The maxilla, labium, and sternum are similar in colour to the cephalothorax.

The abdomen is of a yellow-brown hue, clothed with darker hairs. There are faint traces of a short, oblong marking (pointed behind) at the middle of the fore extremity of the upperside, followed to the spinners by a series of several, similarly indistinct, transverse angular lines.

The genital aperture is of a simple, elongated, pointed, transverseoval form, placed at the posterior extremity of a rather considerable enlargement or prominence.

A single example, found at Dunedin, New Zealand, was receired
in 1879 from Captain Hutton. In general appearance and colours it reminds one strongly of Spiders of the family Palpimanides, from which, however, it is clearly distinct, and its true position is, as it appears to me, among the Enyoides, near the genus Ceto, Sim., to which it seems to be tolerably nearly allied, though differing in the relative length and breadth of the cephalothorax, as well as in the form of the maxillæ and labium, and in other structural points.

## Fam. Agelenides.

## Robsonia, gen. nov.

Cephalothorax short, broad, truncated before, not very convex above; the fore extremity of the caput scarcely narrower than the thorax; lateral marginal constrictions at the caput very slight.

Eyes small, subequal, in two transverse subparallel rows, the anterior of which is the shortest and very close to the fore margin of the caput, rendering the clypeus almost obsolete. The posterior row of eyes is slightly curved, the convexity of the curve directed forwards; the four central eyes are the smallest.

Legs moderate in length, slender, 1, 4, 2, 3, furnished with very fine prominent hairs, some of which, on the undersides, are very long. On the tarsi and metatarsi of the third and fourth pairs are a very few short spines. Tarsal claws three in number; the superior pair strong, slightly curved, and furnished with about ten fine denticulations or pectinations; the inferior claw very abruptly bent downwards close to its base. The hairs are strongest and most numerous beneath the fore extremities of the metatarsi aud tarsi of the second, third, and fourth pairs, but do not constitute either a scopula or claw-tuft properly so-called.

Falces very long, strong, straight, prominent, and almost cylindrical ; the fang, when at rest, directed backwards, slightly obliquely, but approaching nearly to the position characteristic of the Theraphosides. Each falx is furnished with a row of teeth almost throughout its whole length on the inner side of the fang as it lies at rest, and two others form a short row on the opposite side of the base of the fang.

Maxilla long, straight, greatly enlarged at the hinder part where the palpi are inserted, and constricted immediately above that point; their outline is rounded to the extremity, where they are obliquely truncated in a slightly hollow line inwards.

Labium long, about two thirds the length of the maxillæ, of a broadish oblong-oval form, truncated both at the base and apex.

Sternum heart-shaped.
Abdomen oviform: spinners six, rather short, but all of equal length, the two middle ones being of unusual size, almost equal, in fact, to the rest.

The affinities of this genus are rather puzzling. Were it not for the three terminal tarsal claws, it would seem to come easily into the family Drassides. The form of the maxillæ and labium point to a relationship with the Dysderides. It must, however, I think, be
included in the family Agelenides, where it would appear to come somewhere before the genus Argyroneta. It is allied to Desis, Walck.; but the eyes differ both in relative size and position, the legs are more slender, and the maxillæ are not divergent. These differences seem to me to separate it decidedly from that genus.

Dr. L. Koch (Die Arachn. Austr. pp. 345-351, pl. xxix. figs. 1,2) describes two Australian Spiders which he places in the genus Desis, Walck. One of these (Desis mertensii) appears to be aquatic in its habits, very much like the Spider here described, and to which it bears considerable general resemblance. I have mentioned above some reasons for considering that the present Spider is not a Desis; and for similar reasons I do not think it belongs to the same genus as the Spiders described by Dr. Koch-more especially as in Dr. Koch's two species there are spines on the femora, tibiæ, metatarsi, and tarsi of the third and fourth pairs of legs, as well as on the femora of the first and second pairs, whereas in the present Spider there are a very few short spines on the metatarsi and tarsi only of the third and fourth pairs.

Robsonia marina. (Plate LII. fig. 4.)
Argyroneta marina, Hector, Trans. \& Proc. N. Zeal. Instit. x. p. 300 (1877), and C. H. Robson, l. c. p. 299.

Robsonia submarina, Cambr. MS. 1877.
Adult male, length, exclusive of the falces, from 4 to $4 \frac{1}{2}$ lines; adult female, rather over 6 lines.

The cephalothorax and falces are of a dark reddish yellow-brown colour; the normal grooves and indentations very slightly defined. The maxillæ, labium, and sternum are of a rather lighter hue than the falces. The legs are pale dull brownish-yellow, the two basal joints nearly as dark as the sternum.

The palpi are rather long, slender, furnished with hairs only, and similar in colour to the legs; those of the male bear a very strong general resemblance to those of Drassus lapidicolens, Walck. The humeral joint is curved, the cubital and radial joints together equalling it in length ; the radial is more than double the length of the cubital joint, and has at its fore extremity on the outer side a broadish, but not very long, bifid apophysis, whose lower limb is broad, obtuse, and much larger than the upper; the latter, as well as the superior margin of the former, are of a deep blackish colour. The digital joint is long, narrow, and tapers to a blunt point at its anterior extremity, where there are several short spines. The palpal organs are simple in structure, and not very prominent.

The abdomen is of a pale dull yellowish-brown colour, tinged (when alive) with greenish, and pretty well clothed with fine hairs of a darker hue.

The falces are porrected almost straight forwards, and are equal in length to that of the cephalothorax.

The female resembles the male in colours and general structure, but is larger, and the falces are slightly shorter. The legs also are shorter, particularly those of the first pair.

Examples of both sexes of this exceedingly interesting Spider were kindly sent to me in 1877 by Capt. F. W. Hutton, having been captured by Mr. C. H. Robson in tidal pools at Cape Campbell, in New Zealand. On a careful examination, it appeared to me that a new genus must be established to receive it. I therefore prepared a description of it under the name Robsonia submarina, dedicating the genus to its finder, and conferring its specific name on account of its submarine habits. Subsequently I find that Mr. Robson has published (l. c. cit. suprì) an account of this Spider; and Dr. Hector (the Editor of ' 'Tr. N. Z. Inst.') has, in a footnote to Mr. Robson's paper, proposed for it the specific name murina, including it in the genus Argyroneta.

The habits of this Spider are so abnormal, that I cannot refrain from giving almost verbatim the following extracts from Mr. Robson's very graphic account:-
"This Spider is found in the tidal pools at Cape Campbell, and is quite at home under water, forming its nest in an old Lithodomushole, of which the rocks are full. All the Spiders of this kind which we have found have had nests in these holes, and always under water at all times of the tide. Over the mouth of the hole the Spider spins a close web, which, when finished, looks like a thin film of isinglass, and is water-proof; behind this film is the nest and egg-sac, which last is of various shapes and contains a large number of eggs. When the Spider is disturbed, it goes to the bottom of the pool; and if a small stick or straw is extended to it, it at once gets ready for a fight, advancing its long and powerful falces for that purpose. When a small fish is placed in a bottle of water with one of these Spiders, the latter will attack it at once, driving its long sharp fangs into the fish near the head, and killing it instantly."

Excepting in its aquatic habits, concerning which, however, more detail is very desirable, there is but very slight affinity between this Spider and Arygroneta aquatica. It is the first instance, however, on record of a Spider inhabiting the sea ${ }^{1}$.

## Fam. Theridides. <br> Genus Argyrodes, Linn.

Argyrodes lepida, sp. n. (Plate LII. fig. 5.)
Length of the adult female $1 \frac{1}{3}$ line.
Cephalothorax oval, truncated in front; lateral marginal constrictions at caput very slight ; the profile line forms a regular and continuous curve, only interrupted by a slight notch immediately behind the eyes. The ocular area is a little prominent at its fore part, and the height of the clypeus is nearly about equal to half that of the

[^62]facial space. The colour of the cephalothorax is a deep reddish brown ; the surface is finely rugulose, and furnished with a few coarse hairs.

The eyes are placed in two transverse and about equally curved rows, forming a long narrow oval figure, occupying the whole width of the fore part of the caput; those of the fore-central pair are the largest, and are seated on a tubercular prominence, being also very nearly contiguous to each other ; those of each lateral pair (which are rather widely removed from the four central eyes) are seated on a strongish tubercle; those of the hind-central pair form a line rather longer than the fore-centrals, and are separated from each other by a little more than a diameter's interval, an interval of about $1 \frac{1}{2}$ diameter also separating each from the hind-lateral eye on its side.

The legs are very slender; their relative length $1,2,4,3$; those of the first pair very long, of the second pair rather shorter; those of the third and fourth pairs very much shorter. They are furnished with fine hairs, and each has three slender spine-like bristles. Those of the two first pairs are of a reddish yellow-brown colour, the two hinder pairs being pale dull yellowish, broadly annulated with dark brown.

The palpi are slender, of a pale whitish-yellow hue, excepting the fore part of the radial and the digital joint, which are reddish brown.

The falces are strong, rather lighter-coloured than the cephalothorax, a little divergent at their extremities, prominent at their base in front, and furnished with very fine tubercles or granulations on their outer sides.

The maxilla are of normal form, and of a dark-brown colour; the labium is rather darker; and the sternum is similar in colour to the falces.

The abdomen, looked at from above, is of an oral form, broadest in front, and obtuse behind: in profile it is triangular. On the upperside it is black, with a central longitudinal yellowish-white stripe; terminating short of the extremity in a triangular form, on each side of this, but shorter than it, is a narrower longitudinal curved stripe of the same hue; and following each curved stripe are two other short oblique stripes of the same colour and in the same longitudinal line. The sides are reddish, marked obscurely with several oblique pale stripes; the underside between the spinners and the extreme point of the abdomen is black, with a short longitudinal pale stripe just beneath the point. Spinners short, of a pale whitishbrown hue, and deeply imbedded in a circular kind of cavity at the lower angle of the abdomen. The genital aperture has a small slender, cylindrical, pale prominent process connected with it.

A single example of this pretty species was contained in Mr. Atkinson's New-Zealand collection,

## Genus Lithyphantes, Thor.

## Lithyphantes lepidus, sp. n. (Plate LIII. fig. 9.)

Length of the adult male rather less than $1 \frac{1}{2}$ line.
The cephalothorax is of a broadish-oval form, moderately convex above, and the profile line ascends gradually from the hinder extremity in a very nearly even straight line to the ocular area; the fore part of this area, containing the fore-central pair of eyes, is very prominent, causing a deep indentation in the profile of the clypeus, whose height, otherwise, exceeds half that of the facial space. The lateral marginal constrictions are slight, as are also the normal indentations. The colour of the cephalothorax is deep blackish brown.

The eyes are of moderate size; those of the hind-central pair are nearer together than each is to the hind-lateral eye on its side, being separated by less than a diameter's interval ; those of the forecentral pair are smallest of the eight, and are seated in front of a largish somewhat roundish protuberance; they are wider apart than the hind-centrals, though forming a line scarcely as long. The foreand hind-central eyes form a trapezoid whose length is greater than its breadth; those of each lateral pair are placed slightly obliquely on a strong tubercle.

The legs are not very long, moderately strong (1, 4, 2, 3). They are of a dull yellowish-brown colour tinged with olive. The femora are much darker than the other joints, being of a dark blackishbrown hue; the fore extremities also of the tibire and metatarsi are tinged with the same colour. The armature consists of hairs only.

The palpi are short, and of a dark brownish colour ; the radial is stronger than the cubital joint, and enlarges to its extremity, where it joins in closely with the digital joint : the digital joint is of tolerable size and of an oval form ; the palpal organs are rather complex, though compact; and, though showing several prominent points and processes, there is not one of any remarkable character.

The falces are long, strong, prominent at their base in front, and project a little forwards. The fang is long, strong, somewhat sinuous; and instead of lying (when at rest) along the imner edge of the falces, appears to stretch and remain across it at right angles towards the extremity of the opposite falx. Their colour is paler than that of the cephalothorax.

The maxilloe are strong, slightly curved, inclined to the labium, their colour being like that of the falces.

The labium is short, semicircular, and with the sternum (which is oval, somewhat truncated before) similar in colour to the cephalothorax.

The abdomen is oviform, not very convex above, and projects but slightly over the base of the cephalothorax. The upper part and sides are black, with three longitudinal white bands broken into more or less distinct separate patches; the central band is the strongest, the others forming a margin on each side of the upper part of the abdomen : all these bands unite at the fore extremity. The underpart is of a browner tinge, and has an indistinct marginal
whitish broken line on each side, with a central spot of the sane hue. The surface of the abdomen is thinly clothed with short stout fine hairs.

An example of this small, but very distinct, Spider was contained among others sent to me from New Zealand by Capt. F. W. Hutton.

## Atkinsonia, gen. nov.

Cephalothorax short, considerably convex above; caput large, level on upperside. Ocular area slopes rather downwards and forwards, and is prominent ; hinder slope steep; clypeus rather high and compressed.

Eyes as in Euryopis, Menge ; four form a square in the middle, and on each side is a pair placed rather obliquely.

Legs short, slender ; 4, 1, 2,3; furnished with longish coarse hairs and slender bristles only.

Falces very small. Maxilla small, strongly inclined to the labium, which is very short, rather wide, and with a curved apex. Sternum distinctly heart-shaped.

Abdomen flattened oviform, projecting well over the base of the cephalothorax; cuticle somewhat coriaceous, thickly covered with small pock-like markings, and clothed thinly with longish coarse hairs.

Allied to Euryopis, but the form of the cephalothorax is quite different.

Atkinsonia nana, sp. n. (Plate LIII. fig. 10.)
Adult male, length $\frac{1}{16}$ of an inch.
The cephalothorax is of a brownish-red hue, with a small dark blackish patch at the occiput continued forwards by a line of the same colour.

The eyes of each row respectively are equidistant from each other.
The legs are of the same colour as the cephalothorax; the anterior extremities of the femora and the undersides of the tibiæ somewhat suffused with dark brown.

The palpi are short ; the radial is stronger than the cubital joint ; the digital joint is large, oval, and has a small sharp-pointed blacktipped projection at the fore extremity. The convex sides of these joints are not (as in Euryopis and some other genera) turned inwards lowards each other. The palpal organs are simple, with a rather prominent, sharp-pointed process at their extremity.

The maxilla, labium, and sternum are similar in colour to the legs, and the latter is covered with small pock-like markings.

The abdomen is of a rather lighter hue than the cephalothorax, thickly studded both above and below with minute dark red-brown pock-like markings, and thinly clothed with longish coarse hairs; the upperside has three longitudinal black, and rather irregular, bands, a central and two marginal ones; these leave a large, somewhat leaf-shaped reddish marking, bisected longitudinally by the central 'black band, and dentated on its margins. The spinners are short, compact, and enclosed within a kind of sheath-like circular border.

The female differs from the male in having the black abdominal bands broader and more distinctly marked, and the leaf-shaped reddish marking, consequently, narrower and more distinct ; the black patch at the occiput is also larger.

Received from Mr. Atkinson, by whom they were kindly brought to me, with other Spiders, from New Zealand.

## Phycosoma, gen. nov.

Allied to Atkinsonia, but differs in the still shorter and almost round cephalothorax, the much narrower and oviform sternum, the longer legs ( $4,1,2,3$ ), and the form of the abdomen, which last pro jects over the cephalothorax so as to conceal the greater portion of it. The cuticle of the abdomen is not coriaceous, nor covered with pockmarks.

The eyes and ocular area are very nearly like those of Atkinsonia.
The whole Spider bears considerable resemblance to the genus Phycus, Cambr.

Phycosoma ecobioides, sp. n. (Plate LII. fig. 6.)
Adult female, length $\frac{1}{18}$ of an inch.
The ocular area is large and prominent, with a strongly impressed clypeus; the fore side of the square formed by the four central eyes is longer than the posterior side, and the interval between the hindcentral pair of eyes is slightly less than that between each and the hind-lateral eye next to it. The colour of the cephalothorax is dull brownish yellow, with a distinct black marginal line; the upper part of the caput, excepting a patch surrounding the hind-central eyes, is brown-black.

The legs are of tolerable length, yellow-brown tinged with reddish, and are furnished with hairs and slender bristles only.

The palpi are similar in colour and armature to the legs.
The maxillce and labium were almost concealed by the folding over them of the anterior legs, which could not be removed without serious damage to the specimen; but they appeared to be very similar in form and size to those of Atkinsonia nana.

Falces very small, and similar in colour to the cephalothorax, suffused with blackish at the extremities.

Sternum dull brownish yellow, with a broadish dusky black margin.
Abdomen large, oval, and greatly projecting over the cephalothorax ; it is of a blackish-brown hue; on the upperside is a large, rather obscure, yellow-brown, tapering, somewhat dagger-shaped, interrupted, longitudinal central marking, mostly covered with white cretaceous spots and patches; the sides also have each a longitudinal yellow-brown marking, similarly covered with white. The central marking on the upperside appears to consist of the ordinary angular bars exaggerated, especially the anterior one, which is preceded by two large, nearly parallel longitudinal patches of the same colour. Spinners exceedingly short.

This minute Spider, which has a great general resemblance to some species of Ecobius, was received from Mr. Atkinson, by whom it was found in New Zealand.

Genus Walckenaëra, Bl.
Walckenaéra cristata, Bl.
Examples of both sexes of this Spider were contained among others kindly brought to me from New Zealand by Mr. A. S. Atkinson, in 1878. I have carefully compared them with types of the species found both in England and in various parts of the continent of Europe, and (excepting in being a little larger) can find no structural difference whatever.

The occurrence of this species in New Zealand, where it can have had but slight chance of being introduced from Europe, is very interesting, especially as it is the first Spider of this large group as yet recorded from the Antipodes. I should now confidently expect that many more species of TValckenaëra will be found in New Zealand, when its Microaraneæ come to receive due attention.

## Genus Linyphia.

Linyphia subdola, sp. n. (Plate LIII. fig. 11.)
Length of an adult female $2 \frac{1}{2}$ lines, and of an adult male $1 \frac{3}{4}$ line.

The cephalothorax of the female is of a dark yellow-brown colour; the lateral marginal constrictions at the caput are moderate, the other normal indentations well marked. The profile forms a slight, but tolerably even curve to the eyes, though slightly fuller near the occiput; the height of the clypeus exceeds half that of the facial space, and its direction is nearly vertical.

The eyes are rather closely grouped in the usual four pairs; those of the lateral and hind-central pairs are of fair size, very nearly equal, and seated on black tubercular spots; the interval between those of the hind-central pair is equal to nearly about half of an eye's diameter, and each is separated by a diameter's distance from the hind-lateral eye on its side, and by a slightly greater interval from the forecentral eye next to it. The fore-centrals are very small, indistinct, and contiguous to each other.

The legs are rather slender, moderately long, of a yellowish or brownish-yellow hue, furnished with fine hairs and a very few slender bristle-like spines. Their relative length appears to be 1, 4, 2, 3.

The palpi of the female are slender, and similar in colour to the legs; in those of the male, the cubital and radial joints are very short; the latter is longest and much the strongest, being enlarged gradually from the posterior to the anterior estremity, and furnished on the sides with numerous strong bristly hairs. The digital joint is long, and tapers regularly to a point. The palpal organs are tolerably complex ; at their base on the outer side is a small, curved, obtusely-ended, corneous process; and on the inner side, opposite to it, is a curved spine, whose attenuated point has a circular form.

The falces are tolerably long, rather strong, a little prominent at their base in front, divergent at the extremities, and slightly directed backwards; on their inner sides are four longish sharp teeth. The colour of the falces is like that of the cephalothorax.

The maxille are moderately long and straight, rather broadest at their extremities, which are somewhat obliquely truncated on the outer side, but a little inclined to the labium, and similar in colour to the falces.
The labium is short, of a semicircular form, and rather darker in colour than the maxillæ.

The sternum is heart-shaped, and like the falces and maxillæ in colour.

The abdomen is oval, tolerably convex above, and projects a little over the base of the cephalothorax ; it is of a pale dull brownish hue on the upperside, and marked with two irregularly dentated longitudinal black bands, leaving a central longitudinal pale brownish band, more or less regularly dentated at its hinder half, where it often takes the ordinary form of a series of triangular markings or angular bars. The pale brown portions are more or less covered with bright white fleck-like spots; the sides are blackish, and the underside dull yellowish brown. The genital aperture is small, of a somewhat oval form, and is divided by a short, obtusely pointed process. The spinners are small, short, and of a dull yellowish hue.

The male resembles the female in colours and markings, but is smaller, and its legs are longer.

I have received examples of both sexes of this Spider from several parts of New Zealand, kindly sent to me by Mr. Faraday, Mr. A. S. Atkinson, Dr. Llewellyn Powell, and Captain F. W. Hutton.

## Linyphia peramgena, sp. n. (Plate LIII. fig. 12.)

Length of an adult male $1 \frac{1}{2}$ line, and of an adult female the same.
The cephalothorax is of a broad-oval form behind, the anterior part much narrower, the marginal constrictions on each side of the caput being moderate. Its colour is a dark reddish black-brown, getting paler on the fore part of the caput and towards the lateral margins, and leaving a well-defined, narrow, longitudinal, slightly tapering orange-yellow band along the middle, from the eyes to the posterior margin. The profile line from the eyes backwards forms a slight but even curve; the ocular area is rather prominent, owing to the strong tubercles on which the eyes are placed, and the height of the clypeus is nearly about half that of the facial space, or perhaps rather less. The caput is furnished on the upperside with a few hairs, directed forwards.

The eyes are of a dark grey hue, of tolerable and nearly equal size, excepting those of the fore-central pair, which are much the smallest; all are on black tubercular spots; those of the hind-central pair are rather further from each other than each is from the hind-lateral eye on its side, the interval being no more (if as much) than half a diameter. The anterior row, looked at from in front, is straight, though, from the much larger size of the lateral eyes, it looks as though a little curved, with the convexity of the curve directed backwards. The eyes of each lateral pair are placed contiguously to each other on a strong rounded tubercle, their direction being straight (that is, not oblique, as is commonly the case). The general position of the eyes
reminds one greatly of that of Spiders of the genus Enyo, being also more closely grouped together than those of the typical Linyphia. I think, however, without much doubt, that it belongs to Linyphia, resembling, most nearly, species of the "circumspecta" group. Those of the fore-central pair are separated by a small but distinct interval.

The legs are long and very slender, $1,2,4,3$; they are of a bright, rather orange-yellow colour, furnished with fine hairs and a very few fine spines, none of the latter, however, being on the metatarsi.

The palpi are short, similar in colour to the legs, excepting the digital joint, which is brownish yellow ; the radial is much stronger than the cubital joint; each of these joints has on its fore side, directed forwards, among other shorter and less strong ones, a long, strong, curved, tapering bristle, the two spines running parallel to each other, that on the cubital joint being rather the longest. The digital joint is large, with a large lobe towards the base on the outer side. The palpal organs are prominent, complex, and directed outwards; at their base on the outer side is a strongish, somewhat crescent-shaped process, whose exact shape is not easily made out, though very characteristic; there are also other strong, bold processes underneath and at their extremity.

The falces are long, moderately strong, divergent at their extremities, and a little inclined backward to the labium. Their colour is dark yellow-brown, and they are armed with a few sharp, but not particularly strong, teeth on their inner sides towards the extremity.

The maxilla and labium are of normal form, and similar in colour to the falces, while the sternum is darker-coloured, being as dark as the cephalothorax, excepting in the centre, which is rather paler than the rest.

The abdomen is oviform, nearly black, bordered on the upperside by a somewhat broken, dentated, narrow white band, with a longitudinal central series of strongish, well-defined, angular, dull yellowbrown markings, the two anterior ones being much the largest and confluent. The foremost, in fact, represents, both in its form and position, the normal marking, usually found in most Spiders, along the middle of the fore part on the upperside of the abdomen. The underside has also a narrow, marginal, slightly curved border on each side, of a dull colour flecked with white spots.

The female resembles the male in colour and markings. The genital aperture is of very characteristic form, and has three parallel, longitudinal, narrow processes running backwards in close proximity to the under surface of the abdomen; the central process is the longest and narrowest, and is placed between the others and the abdomen.

This Spider is allied to Linyphin subdola, and resembles it a good deal in the abdominal portion ; but it is smaller, and the markings of the cephalothorax, as well as the palpi of the male and genital processes of the female, will serve to distinguish it readily.

Received from Capt. F. W. Hutton, from Wellington, N. Z. Proc. Zool. Soc.-1879, No. XLV.

Linyphia melanopygia, sp. n. (Plate LIII. fig. 13.)
Adult male, length $1 \frac{1}{3}$ line.
The cephalothorax is of a yellow-brown colour, rather the darkest on the caput, the lateral marginal constrictions of which are slight. The profile line forms a slight but even curve from the eyes backwards. The clypeus rather exceeds in height half that of the facial space, and there are a few short bristly hairs on the upperside of the fore part of the caput, towards and in the ocular area.

The eyes are of tolerable and nearly equal size, and (excepting the fore-centrals) of a pearl-grey hue; those of the posterior row are separated by very nearly equal intervals of less than a diameter of one of the hind-central pair, each of which last is separated by a diameter's distance from the fore-central opposite to it; those of each lateral pair are placed obliquely on a strongish tubercle. The fore-centrals are the smallest, and each of them is separated from the fore-lateral eye next to it by rather less than a diameter's interval.

The legs are moderately long and not very slender (1, 4, 2, 3 or $1,2,4,3$ ) ; some of the joints being lost, made it difficult to decide their relative length with accuracy. They are furnished with hairs and a few fine spines (none of the last being on the metatarsi) ; their colour is a uniform bright and rather orange-yellow.

The palpi are moderately long, similar in colour to the legs, excepting the digital joint, which is yellow-brown. The radial joint is somewhat shorter but stronger than the cubital ; it is rather produced on its outer side a little in front, terminating in a bifid form, not very easy to make out clearly, excepting from certain points of view; but the upper portion of this part is tipped with blackish, and is the most prominent of the two. The digital joint is rather small, with a lohe on the outer side. The palpal organs are complex, with, among others, a long, strongish, curved, black-tipped, obtusely pointed spine-like process on their inner side, directed forwards and rather outwards.

The falces are similar in colour to the cephalothorax, strong, considerably prominent at their base in front, divergent, rather attenuated at their extremities, towards which is a strong sharp tooth on the inner side in front, with two or three much smaller, sharp denticulations behind it.

The maxillce are strong, inclined to the labium, gibbous in front, and have one or two angular points or prominences, each surmounted by a bristle, on the gibbous portion. These angular promineuces are peculiar and characteristic, but it is very probable that they are only sexual characters.

The maxillce and labium are rather lighter-coluured than the falces, the sternum being of a similar hue to that of the cephalothorax, glossy, and furnished with a few strongish prominent bristles.

The abdomen is of a pale bright red colour, obscurely streaked (when in spirit of wive) with yellowish, and clothed thinly with coarse dark hairs, the posterior extremity, in the form of a strong ring round the spinners, being jet-black; the spinners are pale yellowish brown.

A single example of this distinct species (which appears to be allied to Neriene rubripes, Bl.), was contained in the collection from New Zealand given to me by Mr. A. S. Atkinson.

## Genus Mimetus, Hentz (Ctenophora, Bl.).

Mimetus mendicus, sp. n. (Plate LIII. fig. 14.)
Adult female, length rather more than $2 \frac{1}{2}$ lines.
The cephalothorax of this Spider is small, of a rather elongate-oval form, and slightly constricted on the lateral margins at the caput; the profile line forms a slight curve, sloping a little from the thoracic junction to the ocular area, which is broad, prominent on the middle and at the sides; the height of the clypeus is rather less than half that of the facial space.

The eyes are of tolerable and nearly equal size, distributed in three well separated groups, and seated on tubercles; the central group (consisting of the fore- and hind-central pairs) forms very nearly a square, and the fore-centrals are placed on a very strong projecting tubercular prominence; those of each lateral pair are contiguous to each other, oblique, and placed on a strong tubercle quite on the side of the caput. The interval between those of the hind central pair is rather less than an eye's diameter, being no more than half that which separates each from the hind-lateral eye on its side.

The colour of the cephalothorax is pale yellow, the caput, and some broken, oblique, converging lines on the thorax, being of a dark yellow-brown.

The legs are long and slender, $1,2,4,3$, those of the first and second pairs greatly the longest; they are similar in colour to the cephalothorax, spotted with dull yellow-brown and with a few darker annuli. The spiny armature of the first and second pairs is like that of the typical species, consisting of a row of very long prominent, strongish, slightly curved spines along the inner sides of the metatarsi and tibiæ, with three to five shorter and more curved ones between each two of them ; the first of these is very short, the rest increasing gradually in length and strength.

The palpi are slender, moderately long, pale yellow, with a dark yellowish-brown annulus at the base of the digital joint.

The falces are long, rather slender, vertical, divergent, the basal half of a pale yellow colour, the rest deep yellowish brown.

The maxille are rather long, not very strong, straight, parallel to each other, of a dark brownish hue, paler at the extremities.

The labium is of a short oblong form, rounded at the apex, and similar in colour to the maxillæ.

The sternum is oval, truncated before, of a yellow colour, marked broadly round the margins with deep reddish yellow-brown oblique markings.

The abdomen is large, very conrex above, with a bluntish subconical eminence on each of the highest parts. It was in bad condition, but appeared to be of an almost uniform whitish hue, with a large, dark, somewhat cruciform pattern on the hinder slope.

Receired among other New-Zealand Spiders from Capt. F. W. Hutton.

## ? Genus Stegosoma, Cambr.

?Stegosoma quadratum, sp. n. (Plate LIII. fig. 15.)
Adult female, length slightly over 1 line.
The cephalothorax is yellow-brown, darkest on the sides of the thoracic portion, which is also depressed, while the caput is elevated and its fore extremity produced and prominent; its slope at the occiput is abrupt and the clypeus is greatly impressed. The surface has the appearance of being thickly covered with minute shallow, but not very well-defined, pock-like marks, and the caput is clothed with coarse hairs.

The eyes occupy the whole of the fore part of the prominence of the caput; they are rather unequal in size; the four centrals form a largish square figure, the anterior (or fore-central) pair being much the largest; those of each lateral pair are contiguous to each other, and placed on the side of the prominence and rather far back, so that the hind-laterals come in a straight line with the hind-centrals, even if not a little further back still, and the intervals between those of the posterior row are nearly about equal.

The legs are short, rather strong, 4, 1, 2, 3. They are of a brownish-yellow colour, broadly, but not very distinctly annulated with deep brown, and are clothed with coarse hairs and slender bristles only.

The palpi are short and similar in colour and armature to the legs.
The falces are small, straight, parallel, and of a dull yellowishbrown hue.

The maxillce are small and greatly inclined over the labium, which is of an oval form, somewhat blunt-pointed at the apex; these parts are of a paler hue than the falces.

The sternum is of a subtriangular heart-shape, dark brown, thickly covered with shallow pock-marks and clothed with coarse hairs.

The abdomen is very large, of a somewhat quadrate form, flattish on the upperside and with a steep hinder slope; the latter marked with several distinct transverse folds in the cuticle towards the spinners. On each side of the hinder extremity above is a large blunt-pointed subconical prominence, directed outwards and backwards. At each corner of the fore extremity is a very much smaller somewhat angular prominence, and about halfway between each of these and the large posterior one is another of the same size. The whole of the surface of the abdomen is thickly covered with minute circular, somewhat shining pock-like marks; but in the absence of a high magnifying-power I could not satisfactorily determine whether they are actually depressed or not; the abdominal surface is also clothed with very short hairs.

The colours and markings of the abdomen appear to vary considerably in different examples. In the one figured the whole of the underside and the greater part (forwards) of the upperside is of a deep brownish-black hue, marked with three spots, in the form of a
triangle, on the middle of the fore part, and two large, somewhat triangular patches, one on each side, between the two anterior angular prominences, of a cream-yellow colour; the hinder part of the abdomen is of pale yellow-brown hue, mottled with blackish brown near the darker surface of the fore part. Another example was somewhat similarly marked on the abdomen, but had an altogether yellowish hue, the cephalothorax, palpi, and legs being yellow, without any markings or annulation whatever. A third example has the abdomen of a shorter form, more convex above, and the posterior conical eminences very much smaller and shorter, scarcely larger than the anterior ones. The whole of the upper surface and sides are of a dull cream-colour, with four dark reddish-brown spots in the form of a trapezium in the middle, and a few veiny lines of the same hue: also at the fore extremity is a dull reddish-brown transverse band, and a few irregular markings of the same colour on the sides; the legs and palpi are annulated. I am more than half inclined to think this example may be of a different species; but at present it will be best to leave it where it is.

An adult male accompanying the above three examples is rather smaller, the abdomen much more flattened, of a uniform deep reddish black-brown, with a few obscure yellowish spots and markings on the upperside, and the posterior prominences intermediate in length and strength between those of the first and second of the females above described; the caput is more elevated and prominent, and the cephalothorax is of a uniform dark red-brown colour. The palpi are rather long and strong; the cubital joint is short and bent, the radial shorter but prominent behind ; the digital joint is very large and of ordinary form, its convex sides are directed inwards; and the palpal organs are rather complex and encircled by a strongish spine.

The examples above described of this interesting little Spider were sent to me by Capt. F. W. Hutton, from the west coast of Otago, New Zealand. I am not satisfied with respect to the generic position here given to this Spider, which has a close affinity to Phoroncidia, Westw., as well as to Stegosoma, Cambr.

> Fam. Thla osomides. Genus Thlaosoma, Cambr.

## Thlaosoma atkinsonit, sp. n. (Plate LII. fig. 7.)

Adult female, length 3 lines, breadth of abdomen at the widest part $3 \frac{1}{2}$ lines.

The general form of this Spider resembles very nearly that of others of this curious genus, but it may be readily distinguished by its colours and markings as well as by the special form of the abdominal protuberances.

The fore part of the caput is upturned, ending in a subconical point, and bearing the four pairs of minute eyes, in the usual position. The colour of the cephalothorax is of a whitish-yellow or pale cream hue, marked on the sides with dusky yellowish brown, leaving
a broad central longitudinal band marked with yellowish brown just behind the eyes.

The region of the thoracic junction is a little raised and divided into two subconical points by a longitudinal cleft.

The legs are rather short, their relative length $1,2,4,3$; those of the first and second pairs are much the longest and nearly equal in length; the femoral joints strong, and armed along the outer side with two rows of very minute spinous tubercles. The colour of the legs is similar to that of the cephalothorax, obscurely annulated with pale yellowish brown and marled irregularly with red-brown. The tarsi terminate with three claws, each one differing from the rest in strength and curvature.

The palpi are short and similar to the legs in colour and markings.

The abdomen is very large, and irregularly humped or protuberant on its surface; the two leading protuberances are on each side towards the fore part of the upper side, very divergent, and rather directed backwards, the most prominent outer part of each being slightly pointed. The ground-colour of the abdomen is similar to that of the legs, broadly mottled and marked with a greyish yellow-brown hue, chiefly in a transverse direction, just in front of and including the two main protuberances, as well as on the sides, where a bold and obliquely striped appearance is given; in the middle of the hollow of the fore extremity (which projects partly over the base of the cephalothorax) is a largish obloug dark reddish-brown patch. The spinners are short, compact, and of a dark reddish-brown hue.

A single example of this Spider (the first I have seen of the genus from New Zealand) was contained in the collection kindly brought to me by Mr. Atkinson in 1878.

## Thlaosoma hectori, sp. n. (Plate LII. fig. 8.)

Adult female, length very slightly over 2 lines; breadth of abdomen at the widest part $3 \frac{1}{2}$ lines.

This species may be distinguished from Thlaosoma atkinsonii not only by its smaller size, but by the greater proportionate breadth of the abdomen, which, while bearing a somewhat similar general resemblance, is much more shruuken and pinched, giving it a still more boldly protuberant appearance. The outer sides of the posterior extremity of the abdomen are also very prominent. The cephalothorax and legs are of a dull, somewhat olive-tinged yellowish hue; the sides of the caput are rather darker, and the legs, which are considerably longer than those of T. atkinsonii, have a very faint appearance of clouding, or annulation, with dull yellowish brown. The abdomen is of a dull yellowish colour, clouded with dark yellow-brown, and strongly tinged on the fore part with dark rusty brown.

A single specimen was receired in 1879 from Captain F. W. Hutton, by whom it was found at Dunedin, New Zealand.

Fam. Episinides.
Genus Episinus.
Episinus antipodianus, sp. n. (Plate Lili. fig. 16.)
The length of the adult female is $2 \frac{1}{3}$ lines.
This Spider is nearly allied to Episinus truncatus, Walck., but may easily be distinguished by its shorter and distinctly annulated legs, and by a difference of pattern on the cephalothoras and abdomen. The form of those parts is, however, very similar in both species, as also are the relative size and position of the eyes. The ocular area, however, is a little more projecting in the present Spider.

The colour of the cephalothorax is dark yellow-brown, the margins and a patch on each side, near the junctional line of the caput, being pale dull yellowish.

The legs are dull yellowish, distinctly annulated with dark brown, the broadest and darkest annuli being at the extremities of the femora and tibiæ. Their relative length is $4,1,2,3$; and they are furnished with hairs, a slender spine on the genua, and two on each of the tibix.

The sternum is dark blackish brown, with a small, pale, dullcoloured patch at the middle of the anterior extremity.

The abdomen is yellow-brown, mottled and marked with darker brown, blackish, dull yellowish, and white points. A tolerably regular pattern may be traced, formed by slender angular whitish lines, the vertices of the angles directed forwards; the two longest of these lines start from the conically-prominent posterior angles of the upperside of the abdomen, and meet in an acute angle towards the fore extremity; two shorter ones also proceed from the same parts, and meet much further back in a more obtuse angle, within which is a black triangular patch enclosed by a whitish basal line; the four lines above mentioned form a large triangular figure, within which, in a transverse line, are two impressed red-brown spots margined with pale yellowish. Along the middle of the underside is a broad brownish band, marked along the middle with pale yellowish brown, and mar gined on the sides and behind with a pale continuous stripe; and the sides, beneath the angular prominences, are strongly and conspicuously marked with black.

The form of the genital aperture is characteristic and quite different from that of Episinus truncatus.

Received from the west coast of Otago, where it was found by Captain F. W. Hutton.

The occurrence of an undoubted Episinus in New Zealand is very interesting, and appears to me to give us a pretty certain clue to the true affinities of this genus. In 'Spiders of Dorset,' p. 80, I have alluded to the resemblance of Episinus to some species of the Australian genus Stephanopis, Cambr., and observed that though in South America Episinus occurs in company with Spiders intermediate between it and Stephamopis, it had not yet been recorded from Australia. The occurrence now, however, of Episinus in a region
where Stephanopis also occurs leads me to remove the former from Theridiides, where its position has always appeared to be very anomalous, and to form a distinct family of it, next to Stephanopides.

## List of Spiders above described and recorded, with references to page, plate, and fiyures.

Arbanitis huttonii, sp. n., p. 682, Pl. LII. fig. 1.
Migas distinctus, sp. n., p. 683, Pl. LII. fig. 2.
Huttonia (g. n.) palpimanoides, sp. n., p. 685, Pl. LII. fig. 3.
Robsonia (g. n.) marina, Hector, p. 687, PI. LII. fig. 4.
Argyrodes lepida, sp. n., p. 688, Pl. LII. fig. 5.
Lithyphantes lepidus, sp n., p. 690, Pl. LIII. fig. 9.
Atkinsonia (g. n.) nana, sp. n., p. 691, Pl. LIII. fig. 10.
Phycosoma (g. n.) œcobioides, sp. n., p. 692, Pl. LII. fig. 6.
Walckenaëra cristata, B1., p. 693.
Linyphia subdola, sp. n., p. 693, Pl. LIII. fig. 11.

- peramcena, sp. n., p. 694, Pl. LIII. fig. 12.
——melanopygia, sp. n., p. 696, Pl. LIII. fig. 13.
Mimetus mendicus, sp. n., p. 697, Pl. LIII. fig. 14.
? Stegosoma quadratum, sp. n., p. 698, PI. LIII. fig. 15.
Thiaosoma atkinsonii, sp. n., p. 699, P1. LII. fig. 7.
——hectori, sp. n., p. 700, PI. LII. fig. 8.
Episinus antipodianus, sp. n., p. 701, Pl. LIII. fig. 16.


## explanation of the plates. <br> Plate LII.

Fig. 1. Arbanitis huttonii, sp. n., ס".
$a$, profile, with legs and palpi truncated; $b$, right palpus on outer side, and rather belind ; $c$, natural length of Spider.
2. Migas distinctus, sp. n., 아.
$a$, eyes from above and behind; $b$, natural length of Spider.
3. Huttonia (g. n.) palpimanoides, sp. n., 오.
$a$, Spider in profile, with legs and palpi truncated; $b$, front view of eyes and falces; $c$, underside of cephalothorax, with legs and palpi removed, showing the form of the maxillæ, labium, and sternum; $d$, left palpus from in front; $e$, genital aperture; $f$, underside of posterior extremity of abdomen; $g$, natural length of Spider.
4. Robsonia (g. n.) marina, Hector, ơ.
$a$, profile, without legs and palpi; $b$, eyes from above and behind; $c$, maxillæ, labium, and sternum ; d, right palpus from outer side and rather behind ; $e$, spinners; $f$, natural length of Spider, the dotted portion showing the length of the falces.
5. Argyrodes lepida, sp. n., ㅇ.
$a$, Spider in profile; $b$, natural length.
6. Phycosoma (g. n.) ecobioides, sp. n., 오.
$a$, profile; $b$, natural length of Spider.
7. Thlaosoma atkinsonii, sp. n., 오.
$b$, profile ; $c$, eyes from in front and rather underneath; $d$, abdomen from behind; $e$, natural length and breadth.
8. Thlaosoma hectori, sp. м., 오. $a$, natural length and breadth.

## Plate LIII.

Fig. 9. Lithyphantes lepidus, sp. n., $0^{*}$.
$a$, profile ; $b$, eyes from in front ; $c$, natural length of Spider.
10. Atkinsonia (g. n.) nana, sp. n., $\delta^{7}$.
$a$, profile; $b$, eyes from in front; $c$, maxilla, labium, and sternum; $d$, natural length of Spider.

Fig. 11. Linyphia subdola, sp. n., 오.
${ }_{a}$, profile; $b$, eyes from in front; $c, \delta$, without legs or palpi ; $d$, left palpus of male ; $e$, genital aperture of $q ; f$, natural length of of ; $g$, ditto of ㅇ.
12. Linyphia peramoena, sp. n., $\sigma^{*}$.
$a$, profile; $b$, eyes from in front; $c$, right palpus on outer side; $d$, genital aperture ; $e$, natural length of Spider.
13. Linyphia melanopygia, sp. n., ठ.
$a$, profile; $a^{\prime}$, falces and maxille in profile, more enlarged ; $b$, fore part of cephalothorax and falces from in front; $c$, right palpus in front, looking upwards; $d$, left palpus (wanting digital joint) on outer side, from underneath in front; $e$, natural length of Spider.
14. Mimetus mendicus, sp. n., 오.
$a$, profile ; $b$, porticn of metatarsus, enlarged; $c$, genital aperture; $d$, natural length of Spider.
15. Stegosoma quadratum, sp. n., 오.
$a$, profile; $b$, natural length of Spider.
16. Episinus antipodianus, sp. n., 오.
$a$, profile ; $b$, eyes from in front; $c$, genital aperture; $d$, natural length of Spider.
8. On some African Species of Lepidoptera belonging to the Subfamily Nymphalince. By W. L. Distant.
[Received Norember 11, 1879.]

## (Plate LIV.)

The Butterflies referred to and described in this paper are principally (including all the types) in the collection of Mr. F. J. Horniman, and are from the same region as the Papiliones described in a previous paper (suprà, p. 647), viz. the Calabar district (Isubu, Mongo-ma-lobah, Calabar). They formed portion of probably the largest number of West-African specimens ever gathered together at one time, and consequently an unusual opportunity has been afforded of testing the constancy and variability of many described forms.

## Diadema antevorta, n. sp.

ㅇ. Above bluish black. Fore wings with a curved blue fascia, commencing somewhat faintly, and extending transversely across cell about midway, and continued broadly between the two lower median nervules for about half their length, when it is suddenly and abruptly carried downwards and terminates near anal angle; a white transverse band commencing a little beyond end of cell, and terminating a little below centre of upper median nervule; a submarginal row of eight white spots, divided by the nervules (upper two situated close together, fourth smallest), and a marginal row of white streaks situated on each side of the nervules, but obliterated near apex. Lower wing crossed by a central blue fascia, which commences near anterior angle and terminates at about centre of abdominal margin; a marginal row of white streaks divided by the nervules as in upper wings, but becoming bluish towards anal angle. Underside pale browish; markings as above, but blue fascia of upper wings pale
bluish white and abbreviated; the transverse blue fascia of lower wings much narrowed and white.

Exp. wings 4 inches.
Hab. Magila, East Africa.
In structure resembling the $q$ of D. salmacis, Dr.
Diadema dinarba, Hew. Ex. Butt. iii. Diad.t. 2. f. 7 (1865).
This species seems subject to extreme variation, and, as far as I have been able to examine specimens, appears under the following forms:-

Var. a. Typical. Hew. ib.
Var. b. Fore wings with transverse spots much enlarged, almost reaching row of submarginal spots. Hind wings with basal white portion enlarged, and almost occupying half of wing.

Var. c. Fore wings with transverse spots enlarged and fused, occupying the whole discal portion of the wing, and merging with submarginal row of spots, some of which are absorbed. Hind wings with the basal white portion now increased till it occupies all the wings hut a broad outer margin.

Var. d. Both wings almost wholly white. The dark portions of the previous varieties only indicated, and the submarginal row of spots almost obliterated.
$H a b$. Vars. $a, b, d$, Calabar ; var. $c$, Sierra Leone.
It will be thus seen that variation extends from the melanic form, $a$, through gradually increasing albinism, till the extreme form, $d$, is reached; or, of course, vice versd from $d$ to $a$. Besides which, though these typical varieties are indicated, there are numerous intermediate forms which destroy their value as to constancy. Similar variation may be seen in another African species of the genus, D. dubium, Beauv., some of the forms of which are regarded by competent lepidopterists as specific.

## Paradiadema, gen. nov.

Allied to Diadema, from which it differs in the hind margin of the fore wings being scarcely excavated, and the apical angle of the same, which is only faintly prominent; lower subcostal nervules emitted nearer apical margin; costa of hind wings more arched, precostal nervure curved outwardly.

Paradiadema hora, n. sp. (Plate LIV. fig. 1.)
$0^{7}$. Above ferruginous. Fore wings crossed by a transverse white fascia, commencing near costa a little beyond end of cell, and terminating a little below centre of hind margin; this fascia is straightened outwardly, but inwardly, near end of cell, deeply toothed; interior of cell bluish black, with four or five white spots, outer one somewhat linear and perpendicular. Hind wings crossed by a broad yellowish-white fascia toothed outwardly, and widened towards inner margin. Underside much paler in colour, fasciæ as above; cell of fore wings with the white spots bordered with black, a black spot near base, and two irregularly waved black lines, situated
some distance apart near the centre ; beneath cell, and a little below base of lower median nervule, is situated a black ring. Hind wings with two black spots near base, between costal nervure and first subcostal nervule, and an 8 -shaped black mark on basal half of cell.

Exp. wings $3 \frac{2}{10}$ inches.
Hab. Camaroons.
The $ㅇ+$ resembles the $\sigma^{\circ}$, but is larger.

## Romaleosoma edwardsi, Hoev.

Nymphalis (Aterica) edwardsii, Tijd. Nat. Ges. xii. p. 252, t. 4. f. $1 a, b$ (1845); Kirby, Cat. Diurn. Lep. p. 248. 12 (1871).

Romaleosoma pratinas, Doubl. \& Hew. Gen. D. L.t. 38. f. 3(1850); Kirby, Cat. Diurn. Lep. p. 247.5 (1871).

These two described forms are certainly synonymic, as may be at once seen by a comparison of the figures. The mistake originated in the arrangement of the species of this genus by Doubleday and Hewitson in the Gen. D. L. p. 284. R.pratinas is included in the Sect., "body extremely robust, and marked on the upperside with large pale spots;" whilst $R$. edwardsi is placed in another Sect., "body less robust, not marked with pale spots," which is clearly erroneous, and seems to show that the figure of the last species was not consulted.

Romaleosoma losinga, Hew. Ex. Butt. iii. Rom. t. i. f. 5 (1864).

Romaleosoma wardi, Druce, Cist. Ent. i. p. 286. n. 5 (1874).
Mr. Hewitson described this species as having on underside of fore wings "three black spots (forming a triangle) within the cell," and posterior wings as having "a single black spot within the cell." Only one specimen which I have examined in the collection has a single spot only in cell of hind wing, and that specimen differs in only having two spots in cell of fore wing. Some specimens possess two spots in cell of hind wings, and some three; others have three in cells of fore and hind wings, and a transverse black fascia aeross end of cell. One specimen has a fourth spot on hind wing situated outside cell. In most specimens there is also a well-marked violet reflexion on upperside of hind wing near inner and hind margins, particularly the last.

It will thus be seen that some of these forms agree with $R$. wardi, Druce; others, on the underside, with $R$. losinga, IIew. The cellular markings are evidently most inconstant, the violet reflexions above more pronounced in some species than others, and therefore I have been unable to separate the two species without adding varieties which would destroy the value of each.

Romaleosoma lakuma, Butl. Trans. Ent. Soc. 1870, p. 123 ; Lep. Ex. i. t. 21. f. 2 (1871).

This form is most inconstant in markings: in some male specimens the blue striæ on anterior wings is absent ; in some female specimens the discal blue streak extends at its base from abdominal margin to
hind margin, as in $R$. harpalyce. Again, there is another variety which differs from $R$. lakuma in the greater width of the narrow oblique subapical ochreous band, and in the total absence of bluish markings above; underside agreeing perfectly with that of $R$. lakuma. This has been recently described by M. Mabille (Bull. Soc. Zool. de France, 1876, p. 278) under the name of $\boldsymbol{R}$. spatiosum. In some specimens of this form there are faint pale violet indications of the blue striæ in $R$. lakuma.

Mr. Butler, in Lep. Ex. p. 52, writes, R. lakuma "is allied to $R$. eupalus and $R$. harpalyce, which have been considered by some lepidopterists to be varieties of the same species; but I am convinced, from a careful examination of many examples of both sexes of the two forms, that they are perfectly distinct. $R$. losinga is a third species of the same little group, and $R$. lakuma will make a fourth." Since this was written, $R$. wardi and $R$. spatiosum have been described, which bring the number of described forms of this group to six.

They seem to be thus differentiated:-

| Wings generally marked with blue above. |  |
| :---: | :---: |
| Aper of fore wings without or with very obscure yellow band. |  |
| White markings on underside faint and obse | R. harpalyce. |
| White markings on underside very distinct | R. eupalus. |
| Apex of fore wings crossed with yellow band | R. lakuma. |
| Wings without or with faint blue markings above. Apex of fore wings crossed with yellow band. |  |

A pex of fore wings crossed with yellow band.
White markings on underside very distinct ................... $\left\{\begin{array}{l}R \text {. losinga. } \\ R . \\ R \text { vardi. }\end{array}\right.$
White markings on underside faint and obscure ............ R. spatiosum.
Having examined the large number of duplicates that were in the possession of Mr. Horniman, and finding the above characters very inconstant, I much more incline to the opinion that we are dealing with the varietal forms of a protean species. The remarks of Smeatham, communicated to Drury, as to his own personal observations, may well be reproduced:-"There are several Papiliones nearly of this colour, that is to say, with the upperside of the wings having a changeable purple, and the undersides being inclinable to green, \&c. The differences between them arise so gradually that I think them varieties of the same species, some, apparently very different, being found coupled together." Much of the same kind of variation may also be seen in Euryphene phantasia, Hew., from the same region.

Romaleosoma inanum, Butl. Cist. Ent. i. p. 158 (1873).
Three specimens of this form were in the collection. The first perfectly agrees with the description ; the second is without the black spot in cell of hind wings; and the third specimen has the submarginal row and other spots beneath as in $R$. ceres, Fab.

Harma lucasit, Doum. (Nymphalis) Rev. Zool. 1859, p. 262, t. x. f. 2, 오 才". (Plate LIV. fig. 2.)

I am glad to be able for the first time to describe the male of
this fine species; it seems to have been a difficult insect to procure. Doumet described and figured the female only.
$\delta^{*}$. Wings above bright orange, narrowly edged with black on outer margins and along costa of fore wings, excepting basal half, where it is almost concolorous. A large triangular black space, the apex of which commences on the fore wings about centre of inner margin and a little above submedian nervure, extending through lower wing, on outer side to anal angle, and on inner side to abdominal margin about one third from base. Underside pale ochreous; lower wings greyish for about two thirds their expanse from base; both wings crossed by a straight, oblique chocolate-brown band, which commences on costa of fore wing a little beyond cell, and is continued to anal angle of lower wings. Cell of fore wings with two waved black lines some distance apart, the first of which is situated about midway, and a waved black line beyond end of cell, which also terminates in a black line; a black line, enclosing a small rounded space, situated just below cell between submedian nervure and lower median nervule. Cell of lower wings with three transverse black lines, the first of which is somewhat waved. The black band along underside of fore wings is somewhat reflected on upperside.

Exp. wings $2 \frac{9}{10}$ inches.
Hab. Isubu, Camaroons.

## Harma frederica, n. sp. (Plate LIV. fig. 3.)

우. Above like H. amilius, Doum., but the two submarginal rows of spots united with each other and also with the discal band, which is broken, and thus forms a series of eight ray-like streaks occupying outer half of fore wings, of which the upper is very small and obscure; sixth and seventh largest, eighth situated on inner margin and shortened outwardly. The number of these streaks on lower wings is seven; the first almost hidden by inner margin of anterior wings; the base of the fourth occupies apical third of cell; the last is situated between submedian nervure and lower median nervule. Underside agrees with $H$. cemilius in general coloration, but markings as on upperside. Cells without markings.

Exp. wings $4 \frac{1}{10}$ inches.
Hab. Calabar district, but not precisely localized.
Harma beckeri, Herr.-Schff. (Diadema) Ex. Schmett. f. 81 (1852, 1858).

Aphidema beckeri, Kirby, Cat. Diurn. Lepid. p. 229 (1871). Harma theodota, Hew. Ex. Butt. iii. Har. t. 1. f. 3, 4 (1864).
Mr. Hewitson, ib. (text), stated his conviction that the Diadema beckeri, H.-S., was really a species of the genus Harma. Mr. Rutherford, some time ago, told me he considered it was really the female of $H$. theodota, Hew., and I think he was doubtless right in so placing it. The name proposed by Herrich-Schäffer therefore takes precedence.

Harma theobane, Doubl. \& Hew. Gen. D. L. t. 40. f. 3 (1850); Hopff. Pet. Reise, Zool. v. p. 389, t. 24. f. 1-4 (1862).

Both sexes of this species are extremely variable. The male varies much in colour beneath; in some specimens the oblique discal line crossing both wings is bordered outwardly and broadly by a dark fuscous, waved, and irregular fascia. In some specimens of the female above the white markings are almost absent, and the wings are of an almost uniform smoky hue.

## Charaxes agabo, n. sp. (Plate LIV. fig. 4.)

오. Above bluish black, both wings crossed by a wide yellowishwhite discal fascia, commencing where it is narrowest on fore wings, immediately beneath upper median nerrule, and extending through hind wings, where it is broadest and almost reaches base, to abdominal margin; this fascia is outwardly sinuated on fore wings, but regularly curved on hind wings. On fore wings two spots situated transversely rather more than halfway between end of cell and apex; one smaller subapical one and eight small marginal spots, of which the lowest are the largest, yellowish white. Hind wings with a triangular yellowish-white spot on abdominal margin below central fascia; a submarginal row of eight blue spots, becoming larger and more rounded towards apical angle, and a marginal row of blue subcrescentic narrow fasciæ, bordered outwardly with black, and becoming ochreous between inner tail and anal angle.

Underside: front wings black, with the following silvery-white markings:-A basal costal streak; three parallel cellular spots, gradually increasing in size from base, and preceded by two small bluish ones; immediately beneath cell a basal streak, followed by a small spot; beyond cell a subcostal boot-shaped spot, divided midway by a nerrule, followed by a large suboblong spot, divided into three parts by nervules. A submarginal row of seven spots, of which the first five are silvery white, and sixth and seventh ochreous; the first three only divided by nervules; fourth and fifth much the smallest; and a marginal row of eight small spots, the lower two being largest, slightly bluish and crescentic inwardly. Hiud wings silvery white, haring two broad inwardly-curved black fasciæ, both commencing on costa, first terminating on centre of abdominal margin, second passing through end of cell, and terminating along lower median nervule at commencement of posterior marginal band. These two fasciæ are counected transversely, narrowly on costa and broadly near anal angle, and have also a connecting fascia of the same colour which commences about centre of the first, and is forked posteriorly where it joins second near base. A wide black marginal band, containing, first, a row of six narrow transver: - ochreous lines, followed by six large silvery spots and a series of "luish-grey marginal lines; between lower median nervule and anal angle the band is represented by a large ochreous spot, margined with black, and containing two black spots ocellated with blue. Body streaked with silvery white.

Exp. wings $4 \frac{4}{10}$ inches.
Hab. Calabar district; but not precisely localized.
P.S. (Dec. 15th, 1879).-I had in this paper described a species of Charaxes from West Africa under the name of C. galba, which, in a memoir since published by Herr Dewitz, has been described by that gentleman under the name of $C$. hildelrandti. Its nearest allies are C. andara, Ward, from Madagascar, and the Indian species C. fabius, Linn.

## explanation of plate liv.

Fig. 1. Paradiadema hora, p. 704.
2. Harma lucasii, p. 706.

Fig. 3. Harma frederica, p. 707.
4. Charaxes agabo, p. 708.
9. Description of a new Oriole from Borneo. By R. G. Wardlaw Ramsay, F.Z.S., M.B.O.U., Lieutenant 67th Regiment.
[Received October 30, 1879.]

Oriolus consobrinus, sp. n.
우. Allied to Oriolus xanthonotus, but differs in having the head, sides of the face, and ear-coverts smoky cinereous. The yellowishbrown edgings to the wing-coverts are also wanting; but this is not a constant character even in $O$. wanthonotus of, for some examples do not possess it in the smallest degree. The third, fourth, fifth, and sixth primaries are margined and tipped with pale greenish yellow. The rump has an appearance of being tinged with reddish brown, many of the feathers being of that colour. The lower surface is of a much purer white, with a cinereous tinge on the throat. The lower tail-coverts and tail are as in $O$. vanthonotus.

Length (ㅇ, dry skin) 6.5 inches; tarsus 75 ; wing 4 ; tail 2.75 ; bill from gape 85 .

It is more than probable that the male will be found to resemble that of O. axanthonotus, but possibly with the upper tail-coverts reddish or rusty brown.

The comparative measurements I do not consider of much importance, inasmuch as examples of O. wanthonotus from Malacca, Sumatra, S.E. Borneo, Sarawak, and the Philippines, although apparently identical with the typical Javan species, vary much in size inter se.

The specimen from which my description is taken was in a collection, labelled N.E. Borneo, in the museum of the late Lord Tweeddale.

I am indebted to Mr., R. B. Sharpe, of the British Museum, for informing me that this 4 llection was made in the district of Sandakan, in Northern Borneo,
10. On the Question of the Identity of Species of the Common Domestic and the Chinese Goose. By F. B. Goodacre, M.D., F.Z.S.
[Received September 16, 1879.]
Having read long ago, in 'The Origin of Species' (p. 275), about the fertility inter se of "hybrids" between the Common Domestic and Chinese Geese, I was induced, when the opportunity occurred some few years ago, to commence a series of experiments to verify this alleged fertility, several gentlemen very kindly consenting to assist me in the investigation. The following crosses have been obtained by one or another of us, and some of them in more than one case:-Chinese of with Common $i$ produced several Goslings ; a pair of these, out of the same nest, have produced young last year and again this; half-bred of with both Common 우 and Chinese $ㅇ ;$; one quarter Chinese and three quarters Common of with both Common $ㅇ+1$ and Chinese $ㅇ . t$.

The number of the Goslings in proportion to that of the eggs has been small in many, but not in all cases, and is, I think, to be attributed to some accident in our arrangements, and not to any lurking sterility between the two forms. In fact I suspect the two forms themselves, and cross-bred birds of them in any proportions, to be quite as fertile inter se as either of the pure forms by itself.

Now the chief interest in the results of these experiments seems to be that half-bred birds of the same nest produced young; for, as a consequence of their doing so, we seem compelled to believe one of two things, either that hybrid birds can be fertile inter se, or that the half-bred birds above mentioned were not hybrids at all, but only mongrels; in other words, that the two forms of Domestic Goose are specifically identical. Most naturalists have hitherto considered them specifically distinct; it is certain they either are or are not; and how is the case to be decided? The declaration of the most learned naturalists either way cannot settle the point, nor do I see any way of doing so beyond all doubt if we give up that rule, so generally reccived, that hybrids are infertile inter se, and, of course, we cannot quote that rule as a proof against an apparent exception to itself. Yet the fertility of these cross-bred birds may be taken as good presumptive evidence in favour of identity of species in their parent forms, and is quite sufficient to make us inquire more curiously into the matter, to see what other evidence can be found to incline us to believe in such identity. The advocates of their non-identity would very naturally call our attention to the great difference between them as to general form, colour, and voice, to the peculiar knob on the Chinese bird's head, and to its prolonged season of incubation. The existence of the last of these differences (except in books) I have good reason to deny; the other differences must be admitted, and something said with reference to each to show
that they do not absolutely render identity of species improbable. Great as may be the difference of general form, is it greater than that between a Carrier and a Tumbler Pigenn, or between a Greyhound and a Pug among Dogs? As to voice, the Call Duck, Trumpeter Pigeon, and Common Dog all afford instances of modification of voice in a greater or less degree, from the normal voice of the Wild Duck and Rock-Dove in the first two cases, while the bark of the $\operatorname{Dog}$ is said to be a domestic accomplishment altogether, but is never supposed to divide Dogs into two species, those that bark and those that cannot ; for the young of the latter learn to bark in this country. As to colour, it should be borne in mind that sandycoloured Geese are not infrequent in some parts. The stripe down the back of the neck of the Chinese Goose is a very distinctive marking; but it may well be asked if it is necessarily of greater value as a specific distinction than the spinal stripe in certain Horses, especially those of a dun colour. The knob on the base of the bill of the Chinese bird is doubtless the greatest distinguishing mark between the two forms.

In the opinion of most naturalists, the Grey-lag Goose is the wild original of our common domestic bird; and from Yarrell we learn that its range extends to China and Japan. The same author also points out its clear grey shoulder as a characteristic of the Grey-lag, distinguishing it from the most nearly allied British wild Geese; and, curiously enough, this is very evident in the Chinese bird. The trachea of the male in most Swans, Geese, Ducks, and Mergansers is a most trustworthy guide as to specific difference: but in the case under consideration it appears to be of little use; for there is good ground for suspecting that the form of the trachea in the Grey-lag is not constant. Yarrell says:-"In the wild Grey-legged Goose the tube of the windpipe is nearly cylindrical; and this form of trachea I have frequently found on examination of domestic Geese intended for the table; but I have frequently also found the tube flattened at the lower portion" (Yarrell's Brit. Birds, vol. iii. p. 55). The tracheæ of two Chinese Ganders which I have myself examined were very slightly swelled and flattened at the lower portion. I have not had the opportunity yet of examining that of a Chinese Goose; the windpipes taken from cross-bred birds condemned for the kitchen, without regard to sex, have all had a very decided swelling and flattening of the lower portion of the tube. In Chinese Geese there is generally a small rim of white feathers at the base of the bill; and a broader band is far from uncommon in the ordinary Domestic Goose. This and the swelled and flattened trachea have been rightly looked upon as analogous variations; but perhaps the cause of their occurrence has been too readily accounted for by Yarrell and others by supposing an admixture of blood from the "White-faced Goose" in the building-up of the domestic form in remote times. May it not be that there is a tendency in the Grey-lag to vary in these directions, and that hence such a tendency reveals itself also in the Chinese form?

It may, I know, be asked, If the Chinese form was modified out Proc. Zool. Soc.-1879, No. XLVI.
of the Grey-lag, how came there to be wild Chinese birds? To which it may be replied, Is it certain that there are any? may not the supposed wild specimens be only feral? If so, it would be a somewhat similar case to feral "chequered" Rock-Doves, as far as regards breeding for generations without reverting to the original type.

The fertility between these two forms of Domestic Geese reminds me forcibly of the same thing between divers so-called species of wild Pheasants, as shown by Mr. Tegetmeier ; and I am inclined to accept his solution of the mystery as applicable to Geese also.

Of course I do not pretend to be able to prove the specific identity of the Common and the Chinese Goose ; but I think what I have said may be taken as evidence that such a theory is really not so absurd as it may at first sight appear to be.

The doctrine of specific identity of certain very diverse forms of animals appears to me one deserving of careful study; and every case that may be supposed to illustrate it in a marked way seems of importance towards attaining what we ought all to be seeking-the truth. Hence the fertility of the offspring of Common and Chinese Geese may teach us lessons of general interest and importance in zoology.

Great variations of a species are chiefly to be observed in domestic animals; but we err if we suppose they do not occur among wild ones, although doubtless many are masked from our observation by their receiving specific names when in reality they are nothing more than varieties or geographical races.

In conclusion I will briefly state that there are three points, in the cross-bred Geese themselves which we have been considering, which incline me to look on them as mongrels. According to the laws of hybridity one would have expected the trachea to be intermediate between the parent forms (as it is in hybrids of the Musk-Drake with the Common Duck), and the knob on the bill and the stripe on the neck to be quite suppressed; now none of these things happen.

I shall be glad to hear that any zoologist is willing to turn his attention towards solving the mystery that certain so-called hybrids produce fertile offspring (which most do not); for this seems always to happen in cases in which the right to specific distinction is questioned by some naturalists.

[^63]
## December 2, 1879.

Prof. A. Newton, F.R.S., Vice-President, in the Chair.
The Secretary made the following report on the additions to the Society's Menagerie during October 1879 :-

The total number of registered additions to the Society's Menagerie during the month of October was 133, of which 2 were by birth, 93 by presentation, 30 by purchase, 4 were received in exchange, and 4 on deposit. The total number of departures during the same period, by death and removals, was 119.

The most noticeable addition during the month was
An example of Elliot's Guinea-fowl (Numida ellioti), purchased October 2nd. This is the first living example we have yet acquired of this peculiar Guinea-fowl, which was first described in the Society's Proceedings for 1877, p. 652, by Mr. Bartlett. It was transmitted from Zanzibar, along with other examples of the same species and examples of the Vulturine Guinea-fowl (Numida vulturina) and of the Mitred Guinea-fowl (Numida mitrata), and is from some part of the East-African coast.

A letter was read addressed to the Secretary by Mr. E. L. Layard, F.Z.S., urging the desirability of the adoption by naturalists of a fixed scale of colour in describing animals.

Mr. Tegetmeier exhibited the head of a Deer (Cervus dama) from which the antlers had been sawn off close to the burr. The animal had escaped shortly after this operation, and had been shot subsequently. It was then found that a new pair of antlers had grown, each one taking its origin in a ring surrounding the base of the previous cut antler, which remained attached to the skull. The new antlers were imperfectly developed, very irregular, and unsymmetrical.

The following letter was read, addressed to the Secretary by Mr. Robert B. White, C.M.Z.S., H.B.M. Acting Consul at Medellin, U. S. of Colombia.

Medellin,

> U. S. of Colombia, S. A. August 24th, 1879.

Str,-I beg to communicate to you the following observations upon the habits of a species of Ant (Atta cephalotes), and upon a method of defence against the ravages of this insect.

There are two varieties of this ant recognized by the people here :a large insect which attacks and carries off indiscriminately all classes of foliage ; and an insect one third smaller, which in a similar manner attacks grasses and minor vegetation. The habits of both ants are identical; but the large kind is that which causes most injury to plantations.

Having observed that no vegetation comes amiss to this ant, that,
whether bitter, sweet, pungent, caustic, tender or tough, every thing is attacked by it, I was led to remark carefully the use to which the ant puts the enormous quantity of foliage which it carries to its nest. After watching the various foraging parties narrowly, I saw that some of them were engaged in carrying food, principally fruits or portions of fruit, sweet buds and blossoms, maize, rice, etc. Others, again, carry only portions of leaves, showing no selection in the quality, as also bits of straw, stick, and similar things. I then further remarked that the ants only employ this vegetable matter to make beds, upon which the eggs are deposited and hatched by the heat produced by the fermentation of the mass of leaves. The ants do not eat these portions of leaf; and the larvæ are fed upon selected food. When a brood has been hatched, the ants clean up their nest and carry out all the decomposed vegetable matter from the egg-beds. This they do periodically ; and the half-rotten fragments of leaves may always be distinguished from the pellets of earth \&c. which the ants ordinarily bring out of their excavations. This hotbed matter is also always thrown out in heaps apart, and in large ant-hills often amounts to ten bushels and upwards.

The only efficacious remedy which the farmer has hitherto used against these enemies is the extermination of the ant-colony, which is effected by digging out the nest, flooding it with water or poisoning its inmates with sulphur or acid. But it is often impossible to put this plan in practice-where a clearing or plantation is surrounded by forests or uncultivated ground, in which hundreds and thousands of ant-hills are to be found. I have tried, as many people before me, all sorts of schemes, including the use of all the abominable-smelling and tasting compounds which can be used without killing the plants which one wishes to protect, and have found all inefficacious.

But it seems that the real remedy is near at hand; and it was shown to me by a negro.

When a plantation or garden is attacked, all one has to do is to procure a bushel or so of the decayed leaf beds thrown out of an ant-hill entirely unconnected with that from which the invading ants proceed, and scatter this matter on the ant-roads and about the plantation.

The effect is miraculous. A panic siezes the ants. They drop their burdens instantly; the word is passed along the roads; and empty-handed the whole army hurries off to the nest. They will not return to the same plantation for many weeks; and even then they avoid all spots in which traces of this (to them) offensive matter may remain. The smallest dose suffices; and a bushel of rotten bedding will defend acres of ground. But care must be taken, as remarked, to procure this matter from a distinct ant-hill. If it be from the same nest, the ants take no notice of it.

I have seen this plan tried repeatedly during the last few months, and it has never failed. The biggest army of ants, engineers, pioneers, directors-general and all, is utterly discomfited by this simple means of defence. What the ants see in it I cannot say; but I fancy that they imagine themselves to be in danger of being
attacked by another set of ants, and hurry off to protect their nest. By repeatedly applying the same matter to a nest, the ants at last become so annoyed that they emigrate, carrying their females and eggs to a distance and forming a new colony.

This plan is not generally known, even here in the State of Antioquia; and I have thought that our colonists might profitably be made acquainted with it. By its use we may ward off an unexpected attack by the invader until an opportunity offers of exterminating the brood; and when this cannot be done, it may constitute the only means of defence for crops.

The vegetable matter spoken of is naturally an excellent manure, as I have observed in the case of rose-bushes which I have protected by its use.

Should you consider the above observations to be useful, I trust that you will be so good as to make them known to the Society. I am, Sir,

Your obedient servant, Robert B. White.

The following papers were read:-

1. Notes on some Species of Chiroptera from Zanzibar, with Descriptions of new and rare Species. By G. E. Dobson, M.A.

> [Received October 6, 1879.]

To the kindness of Dr. Robb, H.M. Indian Army, I owe the material which has furnished the following notes. Seven species are represented in the collections; and all the specimens are well preserved in alcohol.

## 1. Epomophorus minor, n. sp.

With the exception of Ep. pusillus, this is the smallest species of Epomophorus yet discovered. In the form of the palate-ridges it certainly very closely resembles $E$. macrocephalus, the ridges being similarly shaped, the fifth ridge ${ }^{1}$ having, in most specimens, the same peculiar lozenge-shaped depression in the centre, hitherto considered by me to be characteristic of that species. The head, however, is of very different proportions, being comparatively much smaller; and there is less difference between the males and females in the length of the muzzle; the width of the palate is also greater in proportion to its length.

Tail rudimentary, but distinct, about quarter of an inch in length.
Fur greyish-brown, with a slightly yellowish tinge both abore and beneath; paler beneath, but no white patch on the abdomen of

[^64]either males or females. The usual white tuft at the base of the ears is distinct; and, in males, the long hairs lining the shoulderpouches project conspicuously.

The following Table exhibits the measurements of two adult specimens, a male and a female with feetus in utero; also, for comparison, the measurements of an adult male and female of $E$. macroce-phalus:-

|  |  | E. minor. |  | E. macrocephalus. |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | ad. ${ }^{\circ}$ | ad. 아 | ad. ${ }^{\circ}$ | ad. 오 |
| Length, | head and body. | $4 \cdot 0$ | $4 \cdot 1$ | $6 \cdot 3$ | $5 \cdot 0$ |
| Leng, | head....... | $1 \cdot 65$ | $1 \cdot 55$ | $2 \cdot 6$ | $2 \cdot 3$ |
| , | eye from tip of nostril. | $0 \cdot 65$ | $0 \cdot 55$ | $1 \cdot 2$ | $1 \cdot 0$ |
| " | ear ............. | 0.72 | $0 \cdot 7$ | 0.9 | $0 \cdot 9$ |
| " | forearm | 2.5 | $2 \cdot 4$ | $3 \cdot 5$ | $3 \cdot 3$ |
| " | third finger, metacarpal | $1 \cdot 7$ | $1 \cdot 65$ | $2 \cdot 5$ |  |
| " | , ," lst ph. . | $1 \cdot 1$ | $1 \cdot 1$ | $1 \cdot 5$ | $5 \cdot 7$ |
| " | ,, ," 2nd ph. | $1 \cdot 65$ | $1 \cdot 65$ | $2 \cdot 0$ |  |
| 8 | fifth finger, metacarpal | 1.55 | $1 \cdot 5$ | $2 \cdot 25$ |  |
| , | , ,, lst ph..... | 0.8 | 0.8 | $1 \cdot 0$ | $4 \cdot 3$ |
| " | ,, , 2nd ph. | $0 \cdot 8$ | 0.8 | $1 \cdot 1$ |  |
| " | tibia | $0 \cdot 96$ | $0 \cdot 9$ | $1 \cdot 3$ | $1 \cdot 25$ |
| " | foot | $0 \cdot 6$ | $0 \cdot 6$ | $0 \cdot 85$ | $0 \cdot 85$ |

## 2. Epomophorus labiatus.

Pteropus labiatus, Temminck, Monogr. Mammal. ii. p. 83, pl. 39. Epomophorus labiatus, Dobson, Catal. Chiropt. Brit. Mus. p. 11. Two specimens in the collection are referable to this species, hitherto known only from dried and badly preserved skins. The type in the Leyden Museum consists of a skin of an immature male individual ; but there is another skin in the same collection similarly labelled, which evidently belongs to a full-grown female of the same species, and with this the specimens from Zanzibar very closely agree in measurements, as may be seen from the table below. I have therefore referred them to $E$. labiatus, which, however, as I have already surmised ${ }^{1}$, may turn out to be (when a sufficient number of specimens are available for examination) a local variety only of E. gambianus.

The palate-ridges closely resemble those of $E$. gambianus (see op. cit. pl. ii. fig. $3 a$ ) ; but the fifth ridge is marked by a slight groove only.

Fur above yellowish brown, with ashy extremities; beneath much paler; on the interfemoral membrane and legs extending much less densely than in E. gambianus; a very few hairs only appear on the backs of the feet. In the females there are distinct, though rudimentary, shoulder-pouches.

The following Table exhibits the measurements of an adult female of this species with well-worn teeth, and of an adult female of

[^65]E. gambianus; and it may be seen that considerable differences exist:-

| Length, |  | E. labiatus. | E. gambianus. |
| :---: | :---: | :---: | :---: |
|  | head and body | $5 \cdot 0$ | 5.5 |
| " | head | 1.95 | 2.0 |
| ", | eye from tip of nostril | $0 \cdot 8$ | 0.7 |
| " | ear | $0 \cdot 8$ | 0.85 |
| " | forearm | $2 \cdot 85$ | $3 \cdot 3$ |
| " | thumb | $1 \cdot 2$ | $1 \cdot 4$ |
| " | third finger, metacarpal | $1 \cdot 95$ | $2 \cdot 25$ |
| " | , \# lst ph. . | $1 \cdot 3$ | $1 \cdot 5$ |
| " | , " 2nd ph. | $2 \cdot 0$ | $2 \cdot 25$ |
| " | fifth finger, metacarpal. | 1.9 | $2 \cdot 15$ |
| " | " ", lstph. | ${ }_{0}^{0.9}$ | 1.2 |
| " | tibia ............. | 0.95 1.15 | $1 \cdot 15$ 1.2 |
| , | foot ............ | 0.75 | 0.7 |

3. Trienops persicus, var. afer.

Trienops persicus, Dobson, J.A.S. B. 1871, p. 455, pl. xxviii. ; id. Catal. Chiropt. Brit. Mus. (1878), p. 124, pl. viii. fig. 1.

Tricenops afer, Peters, Monatsb. Akad. Berl. 1876, p. 913.
After a most careful comparison of the specimens in the collection (which must be referred to the same species as that indicated by Prof. Peters under the name of T. afer) with others of T. persicus from Shiraz, I am unable to find any differences of importance. I find that the characters enumerated as distinctive of T. afer, such as the form of the emarginations on the inner side of the ear-conch and the shape of the central lanceolate process of the nose-leaf, are variable to the extent described in the different specimens, while the darker colour of the fur observable in the African form is probably the normal shade in this species, the type specimens from Persia having fur of a paler colour in conformity with that of other species of animals inhabiting the sandy districts about Shiraz ${ }^{1}$.

The following Table shows how very closely the measurements of the Zanzibar specimens agree with those of one of the specimens from Persia, from among which the type of this species was taken :-

| Length, |  | Shiraz. | Zanzibar. |
| :---: | :---: | :---: | :---: |
|  | head and body | $2 \cdot 3$ | $2 \cdot 4$ |
|  | tail | $1 \cdot 2$ | 1.2 |
| " | ear | $0 \cdot 45$ | $0 \cdot 4$ |
| " | forearm | $2 \cdot 0$ | $2 \cdot 0$ |
| ," | third finger, metacarpal | $1 \cdot 6$ | $1 \cdot 45$ |
| , | " ," lst ph. | $0 \cdot 5$ | 0.55 |
| " | " , 2nd ph. | 0.7 | $0 \cdot 65$ |
| " | fourth finger, metacarpal | $1 \times 45$ | 1.35 |
| , | " \# 1st ph.. | $0 \cdot 4$ | 0.45 |
| " | " $\quad$ 2nd ph. | $0 \cdot 35$ | $0 \cdot 35$ |

' See note on the colour of the fur in Vesperugo pipistrellus and other species, in Catal. Chiropt. Brit. Mus. p. 225.


## 4. Rhinolophus ethiops.

Rhinolophus athiops, Peters, Monatsb. Akad. Berl. 1868, p. 637: Dobson, Catal. Chiropt. Brit. Mus. p. 122, pl. vii. fig. 12.

Specimens not differing in any respect from the type.

## 5. Nycteris hispida.

Vespertilio hispidus, Schreber, Säugeth. i. p. 169 (1775).
Nycteris hispida, Dobson, Catal. Chiropt. Brit. Mus. p. 162, pl. xi. fig. 1 (teeth).

An adult female, agreeing with typical examples in the form and relative development of the teeth, in the colour of the fur, and in the shape of the tragus, but differing in the longer ears and slightly greater size throughout.
6. Nycteris grandis.

Nycteris grandis, Peters, Monatsb. Akad. Berl. 1865, p. 358; Dobson, Catal. Chiropt. Brit. Mus. p. 164.

Two perfectly adult specimens of this species, which, by their much greater size, show that the type in the Leyden Museum, and the larger specimen in the British Museum, are both examples of immature individuals. In these specimens, owing eridently to the growth of the adjoining teeth, the small second premolar is much smaller proportionally, and is crushed in between the first premolar and the first molar.

The following are the measurements of one of these specimens, an adult male:-

Length, head and body $3^{\prime \prime}$; tail $3^{\prime \prime}$; head $1^{\prime \prime} \cdot 15$; ear $1^{\prime \prime} \cdot 35$, tragus $0^{\prime \prime} \cdot 3 \times 0^{\prime \prime} \cdot 1$; forearm $2^{\prime \prime} \cdot 5$; thumb $0^{\prime \prime} \cdot 65$; third finger-metacarp. $1^{\prime \prime} \cdot 8$, 1st ph. $1^{\prime \prime} \cdot 2$, 2nd ph. $1^{\prime \prime} \cdot 5$; fifth finger-metacarp. $2^{\prime \prime} \cdot 2$, lst ph. $0 \cdot 7$, 2nd ph. $0^{\prime \prime} \cdot 65$; tibia $1^{\prime \prime} \cdot 2$; calcaneum $1^{\prime \prime} \cdot 0$; foot $0^{\prime \prime} \cdot 55$.

## 7. Nycteris ethiopica.

Nycteris athiopica, Dobson, Catal. Chiropt. Brit. Mus. p. 165, pl. xi. fig. 3 (tragus).

The collection includes the first obtained specimens of this species, preserved in alcohol. These show how difficult it is to correctly describe species from dried skins; for the tragus, instead of being narrower than in $N$. javanica, as originally stated by me, is really broader and altogether larger. The drawing of the tragus (referred to above) which accompanies my description, however, is quite correct. The specimens agree very closely in size ; and the following are the measurements of the largest :-

Length, head and body $2^{\prime \prime} \cdot 35$; tail $2^{\prime \prime} \cdot 25$; head $0^{\prime \prime} \cdot 9$; ear $1^{\prime \prime} \cdot 15$,

$$
\begin{aligned}
& 18 \\
& \text { ", \&in }
\end{aligned}
$$

$$
\begin{aligned}
& \begin{array}{ll}
2 & 3 \\
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\vdots & 3 \\
3 & 3
\end{array} \\
& \text { : }
\end{aligned}
$$



tragus $0^{\prime \prime} \cdot 3 \times 0^{\prime \prime} \cdot 15$; forearm $1^{\prime \prime} \cdot 95$; thumb $0^{\prime \prime} \cdot 55$; third finger一 metacarp. $1^{\prime \prime} \cdot 4$, 1st $\mathrm{ph} .1^{\prime \prime} \cdot 0$, 2nd ph. $1^{\prime \prime} \cdot 2$; fifth finger-metacarp. $1^{\prime \prime} \cdot 65$, 1st $\mathrm{ph} .0^{\prime \prime} \cdot 55$, 2nd ph. $0^{\prime \prime} \cdot 55$; tibia $0^{\prime \prime} \cdot 95$; calcaneum $0^{\prime \prime} \cdot 7$; foot $0^{\prime \prime} \cdot 45$.

## 2. Notice sur quelques Coquilles du Pérou. Par le Prince Ladislas Lubomirsei.

## [Received October 7, 1879.]

(Plates LV. \& LVI.)
Les deux naturalistes polonais, MM. Jelski et Stolzmann, qui ont fait l'exploration du Haut-Pérou, l'un depuis 1870 jusqu'à 1874, l'autre depuis 1875 jusqu'à 1878, ont envoyé de riches collections au Musée de Varsovie; entre autres objets zoologiques, ils nous ont procuré de ces contrées différentes espèces de coquilles terrestres, les unes déjà connues, d'autres encore inédites, que je me propose de publier dans ces notices. La description détaillée des localités qu'ils ont parcourues, a été déjà mainte fois consignée dans les Listes des Oiseaux du Pérou, par le Conservateur du Nusée de Varsovie, M. Taczanowski, et publiée dans les 'Proceedings' de la Société.

## 1. Succinea peruviana, Phil.

Succinea peruviana, Phil., Monogr. Helic. viv. Pfr. t. v. p. 38.
Lima, envoyée par M. Jelski en 1871.
2. Helix (Ammonoceras) trochilioneides, D'Orb.

Helix (Ammonoceras) trochilioneides, D'Orb., Monogr. Helic. viv. Pfr. t. i. p. 113.

Lima, envoyée par M. Jelski en 1871.
3. Helix (Polita) santanaënsis, Pfr.

Helix (Polita) santanaënsis, Pfr., Monogr. Helic. viv. Pfr. t. iv. p. 82.

Tambillo, envoyée par M. Stolzmann en 1878.
4. Helix (Systrophia) pseudo-planorbis, n. sp. (Plate LV. figs. 1, 2, 3.)

Species Helici gyrellæ, Mor., affinis. Testa latissime umbilicata, planorboidea, oblique confertim striata, albida, epidermide lutescente obtecta; spira fere plana, sutura profunda; anfr. 6-7, ultimus vix depressus, non descendens; apert. diagonalis suboblique rotunduta ; perist. simplex, margine columellari regulariter arcuato.
Diam. maj. $16 \frac{1}{2}$, min. 8 , alt. 3 mill.
Pujupé, entre Hualguayuc et Chota, à 10,000 pieds d'altitude, trouvée sous un tronc d'arbre mort, envoyée par M. Stolzmann au nombre d'une cinquantaine d'exemplaires en 1878.

Diffère del' Helix gyrella, Mor., par sa dimension, par sa contexture plus ferme, par sa couleur, qui est blanchâtre, et par son épiderme jaunâtre qui le recouvre, par sa spire, qui est tant soit peu bombée, et par le nombre des tours.

Diffère de l'Helix tortilis, Mor., par sa dimension, par ses stries, qui dans le nôtre sont réparties régulièrement sur tous les tours, par sa hauteur et par le manque du sinus au bord supérieur de l'ouverture.

## 5. Helix (Lysino⿺̈) alsophila, Phil.

Helix (Lysinoë) alsophila, Phil., Monogr. Helic. viv. Pfr. t. v. p. 303.

Chota, envoyée par M. Stolzmann en 1878.
6. Helix (Isomeria) stolzmanni, n. sp. (Plate LV. figs. 4, $5,6$.

Testa semiobtecta, umbilicata, depressa, solida, striata, striis obliquis minutissime granulatis; saturate castanea; spira convexiuscula, vix elevata; anfractus regulariter accrescentes, ultimus carinatus, antice deflexus, basi versus aperturam inflatus; apert. perobliqua, parva, securiformis; perist. purpureo-fulvescens, incrassatum, reflexum, ad carinam angulatum, marginibus callo albo funiculato junctis, dente unico coniformi infra carinam posito.
Diam. maj. 40 , min. 33 , alt. 17 mill.
Montaña de Palto, près de Tambillo, district de Chota, trouvées par M. Stolzmann au mois de Mai 1877, un exemplaire vivant, ayant toutes ses couleurs, et 4 exemplaires morts.

Coquille ombiliquée, à moitié ouverte, déprimée, solide, marquée de stries obliques et granuleuses, granulations punctiformes, petites, parsemées par groupes. Sur la partie basale du dernier tour les granulations sont isolées et presque invisibles à l'œil nu; couleur marron; spire peu élevée; tours de spire au nombre de 5 , très-peu convèzes, le dernier muni d'une carène et brièvement descendant, enflé en dessous et comprimé vers la bouche. Bouche oblique, petite, trapéziforme. Peristome épaissi, couleur pourpre-fauve, un peu canaliculé sur le bord droit, à bords joints par une couche de callus blanc, les bords supérieur et inférieur légèrement étalés et renversés, le columellaire oblique et arrondi. Une dent coniforme au-dessous de la carène.

Je dédie cette espèce à l'infatigable explorateur du Pérou, M. Stolzmann, qui a enrichi le Musée de Varsovie d'un grand nombre d'objets concernant toutes les branches d'histoire naturelle.

## 7. Bulimus (Borus) popelalrianus, Nyst.

Butimus (Borus) popelairianus, Nyst, Monog. Helic. viv. Pfr. t. ii. p. 20 ; Martens in Pfr. Novit. Conch. t. v. p. 3.

Palmal, envoyé par M. Stolzmann en une dizaine d'exemplaires, avec deux œufs de la grandeur d'un œuf de Colombe, fourni aussi en 1870 par M. Jelski en deux exemplaires de Montérico.
8. Bulimus (Borus) sancte-crucis, d'Orb.

Bulimus (Borus) sancta-crucis, d'Orb., Monogr. Helic. viv. Pfr. t. ii. p. 23 ; Mart. in Pfr. Novit. Conch. t. v. p. 6.

Amable Maria, envoyé par M. Jelski en 1871.
9. Bulimus (Borus) lichtensteini, Alb.

Bulimus (Borus) lichtensteinii, Alb., Monogr. Helic. viv. Pfr. t.iv. p. 366 ; Mart. in Pfr. Novit. Conch. t. v. p. 20.

Guajango, envoyé par M. Stolzmann en 1878.
10. Bulimus (Borus) moritzianus, Pfr.

Bulimus (Borus) moritzianus, Pfr., Monogr. Helic. viv. Pfr. t. ii. p. 23.

Punamarca, envoyé par M. Jelski en 1872.
11. Bulimus (Dryptus) sangoe, Tschudi.

Bulimus (Dryptus) sangoa, Tschudi, Monogr. Helic. viv. Pfr. t. iii. p. 317.

Amable Maria, envoyé par M. Jelski en 1872, en 2 exemplaires.
12. Bulimus (Porphyrobaphe) rostomus, Sow.

Bulimus (Porphyrobaphe) iostomus, Sow., Monogr. Helic. viv. Pfr, t. ii. p. 29.

Lechugal, près de Tumbez, envoyé par M. Stolzmann en une trentaine d'exemplaires.
13. Bulimus (Porphyrobaphe) wrzesniowskit, n. sp. (Plate LV. figs. 7, 8.)

Testa imperforata, ovato-elongata, solida, nitida, longitudinaliter striata et minutissime decussata, carneo-fulvescens, strigis longitudinalibus fuscis punctisque sordide liliaceis ornata; spira conica, obtusa; anfractibus convexiusculis, ultimus spiram aquans, basi attenuatus; columella callosa plicato-torta; apert. auriformis, basi angulata, intus alba; perist. album, crassum et expansum, marginibus callo nitidissimo albo junctis, columellari plicato adnato.
Long. 78, diam. 37 mill. Apert. cum perist. 42 mill. longa, intus 16 mill. lata, perist. 4 mill. latum.

Tambillo, envoyé par Mr. Stolzmann en 1878, en un seul exemplaire.

Coquille imperforée, solide, de forme ovoïde-allongée, luisante, spire conique à sommet obtus. Tours de spire au nombre de six, peu convexes, les deux premiers tours, de couleur carnée, sont régulièrement granulés, les deux suivants, fauves, ont des stries distantes et très-marquées, et les deux derniers sont superficiellement striés et croisés par d'autres stries presque invisibles à l'œil nu; la couleur de la coquille a, en général, une teinte carnée, le dernier tour seulement est jaune-verdâtre. Les quatre derniers tours sont marqués longitudinalement de flammes brunes et de ponctuations lilas sales.

Columelle blanche, calleuse, munie d'un pli et tordue. Ouverture inclinée vers l'axe, anguleuse à sa base, blanche à l'intérieur, en forme d'oreille. Peristome blanc, luisant, épaissi et étalé, à bords joints par un callus se continuant à l'intérieur, bord columellaire à pli, affixe.

Je dédie ce Bulime à M. Wrzesniowski, professeur de Zoologie de l'Université de Varsovie, qui par sa science, ses travaux sur les infiniment petits, et par ses découvertes de nouveaux Crustacées, nommément de l'ordre des Amphipodes, s'est acquis une réputation dans la science. A son obligeance je dois aussi les dessins des coquilles que je joins à ces notes.
14. Bulimus (Orphnus) foveolatus, Reeve.

Bulimus (Orphnus) foveolatus, Reeve, Proc. Zool. Soc. 1849, p. 97 ; Monog. Helic. viv. Pfr. t. ii. p. 24.

Amable Maria, envoyé par M. Jelski en 1871.
15. Bulimus (Orphnus) bifasciatus, Phil.

Bulimus (Orphnus) bifasciatus, Phil., Monogr. Helic. viv. Pfr. t. ii. p. 199.

Junin, envoyé par M. Jelski en une dizaine d'exemplaires en 1872.
16. Bulimus (Orphnus) brephoides, d'Orb.

Bulimus (Orphnus) brephoides, d’Orb., Monogr. Helic. viv. Pfr. t. ii. p. 143.

Amable Maria, envoyé par M. Jelski en 1872.
17. Bulimus (Orphinus) porphyreus, Pfr.

Bulimus (Orphnus) porphyreus, Pfr., Monogr. Helic. viv. Pfr. t. ii. p. 199.

Chota, envoyé par M. Stolzmann en une vingtaine d'exemplaires en 1877, assez commun dans cette localité.
18. Bulimus (Orphnus) tserni, Phil.

Bulimus (Orphnus) tserni, Phil., Monogr. Helic. viv. Pfr. t. vi. p. 121.

Amable Maria, envosé par M. Jelski en deux exemplaires en 1872.
19. Bulimus (Orphnus) jelskit, n. sp. (Plate LVI.figs. 1, 2.)

Testa subperforata, elongato-ovata, apice obtusa, striata, translucens, saturate fulva, quadrifasciata, fasciis brunneis, superior et basalis late, mediana et suturalis angustissime; sutura irregulariter crenulato-plicata; anfractibus 6, convexiusculis, ultimo spiram subcquante; columella vix plicata, subtorta; apert. ovalis, oblonga, intus albescens; perist. simplex, marginibus callo tenuissime junctis, dextro recto, columellari dilatato rimam formante, livido.
Long. 35, diam. 15 mill. Apert. 17 mill. longa, 8 lata.

Amable Maria, près de Tarma, envoyé en 1873 par M. Jelski, en un seul exemplaire.

La coquille de ce Bulime est presque close, de forme ovale-oblongue, transparente, assez solide, striée irrégulièrement, de couleur jaune-olivâtre, munie de 4 bandes brunes, dont deux plus étroites et deux plus larges. Sa spire est conique, à tours convexes et à sommet obtus; la suture est crénelée et munie de plis courts. Tours de spire au nombre de six, le dernier égalant presque la spire. La columelle ayant un pli obsolète est légèrement tordue. Ouverture ovale-oblongue, couverte à l'intérieur d'une légère couche de callus blane, laissant apercevoir par transparence les bandes brunes. Peristome simple, émoussé; les bords sont joints par un callus trèsmince, le bord columellaire, de couleur livide, est un peu élargi, couvrant la perforation.

Je dédie ce Bulime au savant explorateur M. Jelski, qui dans les localités qu'il a visitées, l'île de Madère, la Guyane, la Martinique, et enfin le Pérou, a laissé des traces ineffaçables de son activité et de l'attachement à sa patrie, qu'il a enrichi de ses collections, recuellies avec tant de peines et de discernement.
20. Bulimus (Goniostoma) chanchamayensis, Hidalg.

Bulimus (Goniostoma) chanchamayensis, Hidalg., Monogr. Helic. viv. Pfr. t. viii. p. 111.

Tarma, envoyé par M. Jelski en 1872, en trois exemplaires.
21. Bulimus (Drymeus) interpictus, Mart.

Bulimus (Drymæus) interpictus, Mart., Monogr. Helic. viv. Pfr. t. vi. p. 21.

Junin, envoyé par M. Jelski en deux exemplaires en 1872.
22. Bulimus (Drymeus) alto-peruvianus, Reeve.

Bulimus (Drymaus) alto-peruvianus, Reeve, Monogr. Helic. viv. Pfr. t. iii. p. 366.

Tambillo, envoyé par M. Stolzmann en 1878, en une dixaine d'exemplaires.
23. Bulimus (Drymeus) cantatus, Reeve.

Bulimus (Drymœeus) cantatus, Reeve, Monogr. Helic. viv. Pfr. t. iii. p. 373.

Tarma, un seul exemplaire fourni par M. Jelski en 1872.
24. Bulimus (Drymeus) orthostoma, E. A. Smith.

Bulimus (Drym®us) orthostoma, E. A. Smith, Proc. Zool. Soc. 1877, p. 364.

Tambillo, envoyé par M. Stolzmann en 1878, en huit exemplaires.
25. Bulimus (Scutalus) nigropileatus, Reeve.

Bulimus (Scutalus) nigropileatus, Reeve, Monogr. Helic. viv. Pfr. t. iii. p. 427.

Chota, envoyé par M. Stolzmann en 1878, en une dizaine d'exemplaires.
26. Bulimus (Scutalus) proteus, Brod.

Bulimus (Scutalus) proteus, Brod., Monogr. Helic. viv. Pfr. t. ii. p. 61.

Bulimus sordidus (Desh.), Reeve.
Tarma, envoyé par M. Jelski en 1872, et par M. Stolzmann de Chota en 1878, en grand nombre et beaucoup de variétés.
27. Bulimus (Scutalus) alutaceus, Reeve.

Bulimus (Scutalus) alutaceus, Reeve, Monogr. Helic. viv. Pfr. t. iii. p. 324.

Amable Maria, envoyé par M. Jelski en 1872, environ vingt exemplaires.
28. Bulimus (Scutalus) badius, Sow.

Bulimus (Scutalus) badius, Sow., Monogr. Helic. viv. Pfr. t. ii. p. 189.

Tarma, envoyé par M. Jelski en 1872, une dizaine d'exemplaires environ.
29. Bulimus (Scutalus) versicolor, Brod.

Bulimus (Scutalus) versicolor, Brod., Monogr. Helic. viv. Pfr. t. ii. p. 61.

Truxillo, procuré par M. Jelski en 1871, en beaucoup d'exemplaires.
30. Bulimus (Thaumastus) chrysomelas, Mart.

Bulimus (Thaumastus) chrysomelas, Mart., Monogr. Helic.viv. Pfr. t. vi. p. 133.

Tunin, envoyé par M. Jelski en trois exemplaires en $18 \% 2$.
31. Bulimus (Obeliscus) haplostylus, Pfr.

Bulimus (Obeliscus) haplostylus, Pfr., Monogr. Helic. viv. Pfr. t. ii. p. 152 .

Tambillo, trouvés sous les feuilles par M. Stolzmann, en grand nombre, et envoyé en 1878.
32. Bulimus (Plectostylus) косbir, Pfr.

Bulimus (Plectostylus) kochii, Pfr., Monogr. Helic. viv. Pfr. t. ii. p. 148.

Amable Maria, envoyé en 1872 par M. Jelski, en trois exemplaires.
33. Bulimus (Mesembrinus) trujillensis, Phil.

Bulimus (Mesembrinus) trujillensis, Phil., Monogr. Helic. viv. Pfr. t. vi. p. 129.

Trujillo, envoyé par M. Stolzmanu en 1877, environ une dizaine d'exemplaires.
34. Bulimus (Mesembrinus) sachset, Alb.

Bulimus (Mesembrinus) sachsei, Alb., Monog. Helic. viv. Pfr. t. iv. p. 484.

Tambillo, enroyé par M. Stolzmann en 1878. Dix exemplaires environ.
35. Bulimus (Mesembrinus) pacilus, d'Orb. (?)

Bulimus (Mesembrinus) paccilus, d'Orb., Monog. Helic. viv. Pfr. t. ii. p. 200.

La description de M. d'Orbigny semble s'accorder avec l'espèce envoyée par M. Stolzmann ; mais elle diffère dans quelques traits particuliers aux 25 exemplaires que je possède; par le sommet de la coquille, qui n'est aucunement noir, la disposition des bandes est autre et le nombre de celles-ci est moindre, n'arrivant jamais à 7 ou 8 , et par le péristome qui est simple.

Le sommet et la coloration des bandes présentent les différences suivantes:

1. Var. sommet rose, à 6 bandes noires bordées d'orange, 1 exemplaire.
2. Var. sommet jaunâtre, à 6 bandes interrompues noires, 7 exemplaires.
3. Var. sommet corné à 3 bandes jaune-paille dans la partie supérieure de la coquille, et 3 bandes noires dans la partie basale.
4. Var. sommet blanchâtre à 3 bandes noires autour de la perforation.
5. Var. sommet doré à 3 bandes noires autour de la perforation, la coquille étant jaune.
6. Var. sommet rose, coquille blanchâtre, à une bande étroite blanche au milieu du dernier tour, celui-ci étant ornée de flamme longitudinale jaune-paille.

Chota, envoyé par M. Stolzmanu en 1878.
36. Bulimus (Leptomerus) molecillus, Reeve.

Bulimus (Leptomerus) molecillus, Reeve, Monogr. Helic. vir. Pfr. t. iii. p. 183.

Tarma, envoyé par M. Jelski en 1872.
37. Perideris flammigera, Ferr.

Perideris flammigera, Ferr., Monogr. Helic. viv. Pfr. t. ii. p. 245.
Chota, envoyée par M. Stolzmann en une trentaine d'exemplaires, en 1878.
38. Pupa paredesti, d'Orbigny.

Pupa paredesii, d'Orbigny, Monogr. Melic. viv. Pfr. t. ii. p. 300. Chorillos, trouvée par M. Stolzmann en 1877, sous les pi6cres.
39. Clausilia peruana, Tschudi.

Clausilia peruana, Tschudi, Monogr. Helic. viv. Pfr. t. ii. p. 483.
Mes trois exemplaires, quoique décollés, diffèrent de la descrip-
tion faite par M. Troschel dans le 'Zeitschrift für Malacologie,' 1841, p. 51, en ce que deux de ceux-ci ont 9 tours de spire, et 1 seul est de 7 tours.

Tarma, envoyée par M. Jelski en 1872.
40. Clausilia taczanowskii, n. sp. (Plate LVI. figs. 3, 4.)

Testa non rimata, cylindracea, ventricosiuscula, decollata, fuliginosa, striata et costata, costis lamelliformibus distantioribus albidis undulatis et interdum irregulariter sculptis; anfr. 6-8 parum convexi, ultimus paulo angustior, fere angulatus; apert. sub-quadrato-ovata, fusca. Lamella supera marginalis, flexuosa; infera profundior, obliqua; subcolumellaris arcuata, subemersa; lunella valida; plica palatali unica. Perist.incrassatum, undique liberum, reflexum, fulvescens. Clausilium ovato-elongatum, apice acuminatum.
Long. 22-25' diam. 6 mill. Apert. 6 mill. longa, $4 \frac{1}{2}$ lata.
Bambamarca, recueillies par M. Stolzmann, le 2 mars 1878.
Coquille non rimée, cylindrique, tant soit peu ventrue, décollée, grise, munie de stries assez élevées, particulièrement vers la suture, et de côtes lamelliformes, distantes, anguleuses, ressemblant à des lettres hébraiques, de couleur blanchâtre; tours de spire 6-8 peu convexes, le dernier tour un peu comprimé et presque anguleux à sa base. Ouverture presque carrée, un peu plus étroite vers le bas, de couleur brune. Lamelle supérieure flexueuse, atteignant le bord, l'inférieure oblique, plus profonde, lamelle columellaire arquée; lunelle forte; pli palatale allongé. Péristome réféchi, sale.

Je dédie cette nouvelle Clausilie à Mons. Ladislas Taczanowski, ornithologiste et arachnéologue d'un grand mérite, comme homage de mon amitié et comme preuve de ma réconnaissance à l'homme, qui a bien voulu me guider de ses conseils dans mes travaux conchyliologiques.
41. Clausilia slosarskit, n. sp. (Plate LVI. figs. 5, 6, 7.)

Testa non rimata, cylindraceo-fusiformis, decollata, violaceo-brunnea, sericea, subtiliter et undulatim striata; anfr. 6-7, ultimus breviter. solutus; cervix rotundata; apert. rotunduto-ovata, fuscescens; lamella supera marginalis, elevata; infera obliqua; spiralis flexuosa, et subcolumellaris continua; lunella subarcuata; plica palatalis unica, elongata; perist. undique liberum, late reflexum, sordidum. Clausilium ovato-oblongum.
Long. 22-26, diam. $5-5 \frac{1}{2}$ mill. Apert. $5-5 \frac{1}{2}$ mill. longa, 5 lata.
Pumamarca, recueillies par M. Stolzmann en 1878.
Coquille non rimée, fusiforme, décollée, de couleur brune-violacée, soyeuse, finement striée; les stries sont longitudinalement ondulées, les stries transversales sont distantes et obsolètes, se laissant apercevoir sur les premiers tours de quelques exemplaires. Tours de spire au nombre de $6-7$, le dernier détaché en avant et arrondi à sa base. Lamelle supérieure elevée; l'inférieure oblique ; lamelle spirale flexueuse, et la columellaire non interrompue. Lunelle distincte, peu
arquée. Pli palatal unique allongé. Péristome réféchi, de couleur blanc-sale.

Je dédie cette Clausilie à l'adjoint de la chaire d'anatomie comparée, Mons. Antoine Slósarski, qui s'est occupé particulièrement de la faune conchyliologique du Royaume de Pologne, et qui par ses travaux anatomiques sur les Mollusques s'est acquis une réputation dans le pays.
42. Clausilia filocostulata, n. sp. (Plate LVI. figs. 8, 9, $10,11$.

Testa non rimata, cylindraceo-turrita, decollata, fulvescens, tenuis, translucens, irregulariter capillaceo-lamellosa; anfr. 8, convexiusculi, ultimus solutus, breviter descendens, supra aperturam sulcatus; cervix vix rotundata; lamella supera marginalis compressa, infera vix elevata, subcolumellaris immersa; lunella brevis, arcuata; plica palatalis unica, distincta. Perist. albidum, continuum, subexpansum. Clausilium ovato-lanceolatum.
Long. 17, diam. 4 mill. Apert. 3 mill. longa, 2 lata.
Dans la localité, nommée Escalon, entre Tunin et Obrajillo, trouvées par M. Jelski, en 1872 au mois de novembre, dans les roches calcaires.

Coquille non rimée, cylindrique et turriculée, grèle, un peu transparente, jaunâtre, munie de lamelles filiformes, les unes en groupes, les autres distantes, plus pâles que le fond; tours de spire au nombre de 8 , peu conveses, le dernier arrondi. Ouverture presque carrée, arrondie vers sa base. Lamelle supérieure marginale, comprimée; l'inférieure élevée, la columellaire grèle. Lunelle arquée, courte. Pli palatal unique et distinct. Péristome blanchâtre, continu et brièvement réféchi.
43. Clausilia chacaënsis, n. sp. (Plate LVI. figs. 12, 13, 14, 15.)

Testa non rimata, fusiformis, solidula, cornea, oblique striatula; anfr. 9, convexi, ultimus breviter solutus, angustior, basi vix compressus, oblique elongatus; apert. trapezoideo-ovalis, lateraliter compressa; lamella supera marginalis; infera obliqua, valida, atro-fulva; subcolumellaris immersa; lunella semicircularis, distincta; plica palatalis unica, elongata. Perist. albidum et vix incrassatum. Clausilium pyriforme.
Long. 14, diam. $2 \frac{1}{2}$ mill. Apert. 4 mill. longa, 2 lata.
Des environs de Chaca, à une heure de distance de Huanta, envoyée par M. Jelski en 1873.

Coquille non rimée, fusiforme, assez solide, striée obliquement, cornée; dans quelques exemplaires on remarque vers la suture des taches plus foncées alternant avec de plus claires ; tours de spire 9 , convexes, le dernier rétréci, peu prolongé et arrondi à sa base. Ouverture trapézoìdale et allongée. Lamelle supérieure marginale ; l'inférieure oblique, plus forte et de couleur brune; la columellaire immergée ; lunelle arrondie et distincte; pli palatal allongé. Péri-

Proc. Zool. Soc.-1879, No. XLVII.
stome grisâtre, réflechi et épaissi. Je donne le nom à cette Clausilie de la localité où cette espèce a été trouvée.

## 44. Guesteria branickif, n. sp.

Envoyće par M. Stolzmann en 1878 de Tambillo, dont la description va incessamment paraître dans le 'Bulletin' de la Société Zoologique de France.

explanation of the plates.<br>Plate LV.<br>Figs. 1-3. Helix (Systrophia) pseudo-planorbis, p. 719.<br>4-6. (Isomera) stolzmanni, p. 720.<br>7, 8. Bulimus (Porphyrobaphe) wrzesniowskii, p. 721.<br>Plate LVI.

Figs. 1, 2. Bulimus (Orphnus) jelskii, p. 722.
3, 4. Clausilia taczanowskri, p. 726.
5-7. - slosarskii, p. 726.
8-11. - filocostulata, p. 727.
12-15. - chacaënsis, p. 727.
3. Descriptions of two new Species of Helix (Eurycratera) from S.E. Betsileo, Madagascar. By Grorge French Angas, C.M.Z.S., F.L.S., \&c.
[Received October 27, 1879.]
(Plate LVII.)
Helix (Eurycratera) betsileoensis, n. sp. (Plate LVII. figs. 1, 2.)
Shell broadly umbilicated, depressedly ovate, rather solid, somewhat shining, irregularly transversely rugosely striated on the last whorl, the upper whorls finely and distinctly granulated, the last faintly keeled at the periphery, dark-olive brown, spotted here and there with greenish yellow, darker below the keel, with very indistinct indications of bands above it, upper whorls greenish yellow, spire flatly convex, apex depressed; whorls $3 \frac{1}{2}$, rapidly increasing; base tumid and convex around the wide umbilicus; aperture very oblique, quadrately ovate, interior pearly grey, under the lens very minutely shagreened; peritreme thickened and slightly reflexed, columella a little expanded over the umbilicus, coarsely granulated along the entire inner surface, margins united by a callus.

Diam. maj. 3 poll. 3 lin., min. 2 poll. 6 lin., alt. 1 poll. 6 lin.
Hab. S.E. Betsileo, Madagascar.
Larger and more elongated than H. guesteriana, Crosse, with a tumid base and a wide umbilicus; this species wants the malleated sculpture so remarkable in $H$. guesteriana, as well as the second dark raised ridge above the periphery. It differs also from H. cornugiganteum in shape, the latter being rounder with a flattened base and a small umbilicus.



Helix (Eurycratera) ibaraoensis, n. sp. (Plate LVII. figs. 3, 4.)
Shell imperforate, globosely ovate, moderately solid, shining, transversely irregularly rugosely striated in front and very finely granulated on the upper whorls, the granules descending to the base behind, yellowish olive, encircled with numerous narrow dark brown bands that lose themselves and become darker towards the aperture and base; spire flatly convex, apex depressed; whorls $3 \frac{1}{2}$, rapidly increasing, the last very large and inflated; aperture oblique, large, roundly ovate, pearly bluish violet within ; peristome slightly thickened, the margins united by a thick callus; columella smooth.

Diam. maj. 3 poll. 6 lin., min. 2 poll. 8 lin., alt. 2 poll. 4 lin.
Hab. S.E. Betsileo, Madagascar.
This fine shell somewhat approaches $H$. maynifica, Fér., but is much more globular and compact, with the position of the spire less remote; and it has also a different style of coloration.

Examples of this and the preceding species have lately been received from S.E. Betsileo, Madagascar, by Mr. Edward Bartlett, of Maidstone, who has kindly placed them in my hands for description.

## EXPLANATION OF PLATE LVII.

Figs. 1, 2. Helix (Eurycratera) betsileoensis, p. 728.
3,4. - (—) ibaraoensis, p. 720.
4. On Arachnida from the Mascarene Islands and Madagascar. By Arthur G. Butler, F.L.S. \&c., Assistant Keeper, Zoological Department, British Museum.
[Received November 1, 1879.]
(Plate LVIII.)
Last year a small series of Spiders was obtained through Mr. H. H. Slater from Réunion and Mauritius, of which the following is a list.

1. Scytodes major, Simon.

Plaine des Palmistes, Réunion.
2. Uloborus borbonicus, Vinson.

Mauritius.
3. Olios leucosius, Walckenaer.

Mauritius.
The identification of these three species, however, is a little doubtful, owing to the imperfection of the figures in Vinson's 'Araneïdes des âles de la Réunion' \&c.
4. Pholcus borbonicus, Vinson.

Plaine des Palmistes.
Although the specimen is somewhat injured, there is no mistaking this remarkable species.
5. Meta? sancti-benedicti, Vinson.

There is also a Spider (somewhat damaged) which seems allied to the above, from Mauritius.
6. Nephila labillardieri, Thorell?

Plaine des Palmistes.
Although it seems scarcely possible that the species of Réunion can be identical with that from New Caledonia, I have failed to discover any difference by which to distinguish it from Dr. Thorell's figures.
7. Epeira isabella, Vinson.

Plaine des Palmistes.

## 8. Epeira slateri, n. sp. (Plate LVIII. figs. 1, $1 a, 1 b$.)

ㅇ. Ferruginous ; sides of the cephalothorax blackish; a central irregular longitudinal abdominal band represented by yellow spots and by four blackish depressed spots in the form of a square; falces piceous; labium and maxillæ, pectoral shield, and ventral surface of abdomen testaceous.

Cephalothorax subquadrate in front, almost circular behind the caput, with slightly concave posterior margin, the sutural margins of the caput well defined and terminating in a depression at the second third of the dorsal surface; a central Y-shaped line upon the posterior half of the caput and ending in the same depression; caput hairy, convex; central oculiferous tubercle prominent and Xshaped, the anterior pair of eyes rather further apart than the posterior pair ; lateral eyes small, and placed upon little, oblique, less prominent tubercles at the anterior angle on each side; abdomen short, almost cordiform ; epigyne linguiform ; pectoral shield ovoid, truncated in front; coxæ short, widening towards the culmen; relative length of legs 1, 2, 4, 3. Falces quadridentate on lower margins. Length of cephalothorax and abdomen together 10 millimetres.

Plaine des Palmistes, Réunion.
There is a series of what I take to be a Holothyrus near H. coccinelloides, but differing from Walckenaer's figures in the number of joints in the antennæ and the absence of the linguiform plate on the under surface of the body.

The following Spiders have been received this year from Mada-gascar:-

1. Drassus malagassicus, n. sp. (Plate LVIII. figs. $3,3 a, 3$ b.)
$0^{*}$. Mahogany-red; the cephalothorax with a broad ill-defined hlackish longitudinal band on each side; the caput and a stripe on
each side beyond the blackish bands clothed with depressed whitish pile ; palpi, excepting the bulbus and under surface of body, horn-yellow; bulbus castaneous, clothed with pale brown hair above, black below; falces castaneous, clothed with pale hair; legs sparsely clothed with pale hair and with black spines ; abdomen above brown, densely clothed with short pale greyish-brown hair.

Cephalothorax ovoid, truncated in front, very slightly indented in the middle behind, shelving at the sides, but flattened along the dorsal or central longitudinal region; sutural outline of the caput feebly indicated ; margins of cephalothorax behind the caput regularly convex ; abdomen oval, flattened or truncated in front, posterior extremity obtusely pointed; pectoral shield oval and indistinctly nine-sided; coxe barrel-shaped, those of the two anterior pairs of legs with straight anterior and convex posterior margins. Relative length of the legs 1 and $4,2,3$; relative length of joints as follows:femoral joints-first pair $8 \frac{1}{2}$ millimetres, second pair 7 , third 6 , fourth 8 ; tibial (includiug basitibial or knee-joint) - first pair 11, second 9, third 7 , fourth 11 ; tarsal joints or tarsus-first $13 \frac{1}{2}$, second $11 \frac{1}{2}$, third 9, fourth 14. Falces large, with three conical denticles on the inferior margins, and with a powerful curved movable fang; palpi about 9 millimetres in length, with the bulbus large, pyriform, and incurved. Length of cephalothorax and abdomen together (exclusive of falces) 17 millimetres.

Antananarivo (Kingdon).
2. Gasteracantha borbonica, Vinson.

Antananarivo (Kingdon).
3. Gasteracantha acrosomoides, Cambridge.

Antananarivo (Kingdon).
4. Ceerostris tuberculosa, Vinson.

Fianarantsoa (Shuw).
Unfortunately these specimens were allowed by the collector to get nearly dry and were injured by mould.

## 5. Ceerostris mitralis, Vinson.

Antananarivo (Kingdon).
One specimen, agreeing well with the figures.
6. Cerostris stygiana, n. sp. (Plate LVIII. figs. 4, 4 a, 4 b.)

우. Cephalothorax black, covered when dry with golden pile, posterior portion castaneous; legs above black, banded at base of tibiæ and tarsi with white ; coxæ and femora below castaneous; falces black, fringed above with golden hair ; maxillæ orange above, dark castaneous, fringed with dull lake-red hair, below; labium and pectoral shield blackish; abdomen above testaceous, below black.

Cephalothorax nearly square, but convex at the sides, almost perpendicular behind the caput; the latter more than twice as wide as long, with six projecting horizontal processes or prominent tubercles,
two on each side and two behind, the anterior lateral processes bifid, owing to their confluence with the lateral oculiferous tubercles; a prominent, nearly circular, central oculiferous tubercle bearing the four central eyes; the anterior pair of eyes larger than the posterior pair, nearer together, but separated from each other by a longer distance than from the posterior pair; abdomen scutiform, the anterior margin truncated; the anterior surface oblique, longitudinally sulcated and with a transverse series of six mammiform tubercles upon the ridges between the sulci; a large humeral process on each side, its length six millimetres, its form cylindrical, expanding laterally towards the culmen, which bears three well-developed and slightly incurved conical projections, the central projection forming the apex of the process and therefore considerably more prominent than the two lateral ones; a short distance behind each process is a small impression followed by a small conical process ; lateral margins of the abdomen arched and indistinctly transversely sulcated, posterior extremity obtusely pointed ; pectoral shield scutiform, truncated in front; coxæ short, rugose; relative length of legs $1,2,4,3$, ; tibiæ and tarsi flattened and longitudinally sulcated ; falces large, rugose, with four well-developed teeth on each internal margin and with a very powerful curved movable fang; palpi flattened, bairy, the two terminal joints expanded and longitudinally sulcated. Length of cephalothorax and abdomen together 17 millimetres.

Antananarivo (Kingdon); Fianarantsoa (Shaw).
I have compared three specimens of this singular species. It is allied to C. paradoxa of Java (Plate LVIII. figs. $5,5 a, 5 b$ ) and C. avernalis.

## 7. Cerostris avernalis, Butler.

Fianarantsoa (Shaw).
I was pleased to find even an injured example of this species among Mr. Shaw's Spiders, as, although of little value as a specimen, it is in a sufficiently recognizable condition to prove the constancy of the specific characters.

## 8. Epeira locuples, n. sp. (Plate LVIII. figs. 2, $2 a, 2 b$.)

오. Cephalothorax black ; caput clothed with whitish hair ; legs castaneous, the tarsi orange-yellow, tarsal claws black; tibie and tarsi of third and fourth pairs of legs broadly banded with black; palpi castaneous ; maxillæ and labium blackish, with whitish borders; pectoral shield yellowish, with black border ; abdomen sordid whitish (probably bright chrome-yellow in life), two or three transverse lines across the anterior margin and six central impressed dots in pairs black; ventral surface black, with a triangular basal marking, a semicircular patch on each side, and two transverse ellipsoidal spots a short distance in front of the spinnerets, sordid whitish (probably yellow in life).

Cephalothorax of the usual form, almost circular behind the caput, its posterior area deeply depressed and with two lateral diverging sulci
from the commencement of the depression on each side; caput covered sparsely with long depressed hair, directed forward and projecting beyond the anterior margin; a central shallow rounded depression ; oculiferous tubercles prominent, the central one $\mathbf{X}$-shaped, the anterior pair of eyes much larger and wider apart than the posterior pair; the lateral tubercles slightly oblique, the anterior eyes upon them being larger than the posterior; abdomen broad, oval, hairy in front ; epigyne linguiform, with a well-defined marginal ridge ; pectoral shield pentagonal ; falces acutely quadridentate on each interior margin, the third denticle from the proximal extremity being largest, movable fang curved and tolerably powerful; palpi hairy; legs rather hairy, their relative length being $1,2,4,3$, the second and fourth pairs nearly equal. Length of cephalothorax and abdomen together 10 millimetres.

Antananarivo (Kingdon).
Pyresthesis, n. gen. (Thomisida) ${ }^{1}$.
Apparently nearest to Loxobates, Thorell.
Length of cephalothorax rather greater than the width behind, and half as wide again as, the caput ; dorsal surface to a little beyond the middle nearly flat, slightly sloping forwards, behind the middle abruptly sloping backwards; height just behind the middle equal to width at widest part; eyes occupying the whole anterior portion of the caput, oculiferous tubercles only indicated by little connecting ridges between the eyes; eyes arranged in two arched series, the anterior lateral eyes being the largest and the posterior lateral the smallest; central eyes forming a nearly perfect quadrangle ; front margin of caput rounded, unarmed; external margin of falces with a smooth longitudinal ridge; legs very slightly compressed, nearly cylindrical, short, with a few scattered bristles but no distinct spines; abdomen globular, very slightly longer than broad, very slightly convex below.

Type $P$. cambridgii.
9. Pyresthesis cambridgit, n. sp. (Plate LVIII. figs. 6, $6 a$, $6 b, 6 c$.)

오. Cephalothorax black, tibix banded with yellow; caxæ olivaceous; abdomen above yellow, with scarlet border; the yellow area crossed by three transverse broad black bands, the first and second of which are connected in the centre by a short longitudinal band, and the second and third at their extremities; the first of these bands is arched, and the tro others are slightly angulated and clavate at their extremities ; a fourth very abbreviate and disconnected transverse band followed by a rounded black spot upon the posterior area; under surface dark olivaceous.

Cephalothorax smooth, with scattered hairs upon the caput, the central oculiferous tubercle indicated by a slight swelling of the sur-

[^66]face and by indications of connecting ridges between the eyes, posterior pair of eyes slightly wider apart than the anterior pair, of about equal size; lateral eyes placed obliquely, the anterior eyes fully twice the size of the central ones and four times as large as the posterior lateral ones; pectoral shield cordiform; falces smooth, with wavy external margins and hairy internal surfaces; maxillæ long, inarched, smooth; abdomen rounded, slightly pointed behind, and almost flat below. Legs very short, their relative length $2,1,4,3$; the anterior pair as follows-femur 2 millimetres, tibia including knee-joint $2 \frac{1}{2}$, tarsi 2; second pair-femur $2 \frac{1}{3}$, tibia $2 \frac{1}{3}$, tarsi 2 ; third pair-femur $1 \frac{1}{2}$, tibia $1 \frac{1}{2}$, tarsi $1 \frac{1}{2}$; fourth pair-femur 2 , tibia $1 \frac{2}{3}$, tarsi $1 \frac{1}{2}$; the legs entire therefore being-first pair $6 \frac{1}{2}$ millimetres, second $6 \frac{2}{3}$, third $4 \frac{1}{2}$, fourth $5 \frac{1}{6}$. Length of cephalothorax and abdomen together 8 millimetres, of abdomen alone $5 \frac{1}{2}$.

Antananarivo (Kingdon).

## EXPLANATION OF PLATE LVIII.

Fig. 1. Epeira slateri, Butl., p. 730.
1a. ———, profile view.
1b. _—, falx.
2. - locuples, Butl., p. 732.

2a.-——, profile view.
2b. - —, falx.
3. Drassus malagassicus, Butl., p. 730.

3a.——, profile view.
3b. - , palpus.
4. Corostris stygiana, Butl., p. 731.

4a. - —, profile view.
4b. -_, view of abdomen from behind.
5. -paradoxa, Dolesch, p. 732.

5a._- , profile view.
$5 b$. -- view of abdomen from behind.
6. Pyresthesis cambridgii, Butl., p. 733.
$6 a$. ——, profile view.
6 b. - - caput with eyes.
$6 c . —$ falx.
5. Descriptions of Shells from Perak and the Nicobar Islands. By Lieut.-Col. H. H. Godwin-Austen, F.Z.S., and G. Nevill, C.M.Z.S.
[Received November 6, 1879.]
(Plates LIX. \& LX.)
The shells from Perak described in this paper were collected by Surgeon-Major E. Townsend, then with H.M. 3rd Reyt. Buffs, on the expedition against the rebellious Malays in 1875-76. Some of the smallest were found in the caves of Buket Punong or Pondong, an isolated conical limestone hill about 1000 feet high. The collection brought to Calcutta was a very extensive and most interesting one, proving the richness of the land-molluscan fauna of that portion of the Malay peninsula, and how much more still remains to be


PERAK and NiCOBAR SHELIS

1 b



2 a


NEW PERAK SHELLS

H.H.Godwin-Austen, del et lith


$\odot$
found by future naturalists who may visit the country with more leisure than Dr. Townsend could give during the progress of a military expedition.

The thanks of all interested in malacology must be given him for the interesting new forms he has made us acquainted with.

The Nicobarese shells were collected by Dr. Ferdinand Stoliczka, and were among the large and valuable collections which he bequeathed to the Indian Museum, Calcutta.

Ennea perakensis, n. sp. (Plate LIX. fig. 2.)
Testa parva, viridescenti-crystallina, nitida, solida ; spira paululum elevata, trochiformis, profunde et aperte umbilicata in modo "solariformi" dicto, apice obtuso atque lcevi; superne elegantissime regulariterque transversim sulcata, sulcis pervalidis, planiusculis subrectisque (vix flexuosis) ; anfractu tertio sulcis confertis, ultimis duobus sulcis aqualibus atque distantibus ornatis; subtus ad basin subplana, circa umbilicum subcarinata, prope peripheriam sulcis validis subito fere evanidis, in umbilico rursus conspicue patentibus ; anfract. 5, convexiusculi, ultimo basi plano; apertura perfecte quadrangularis, dentibus 4 coarctatis, dente parietali percrasso, oblique contorto, conspicue prominente; perist. album, incrassatum, marginibus subparallelis, fere rectis, margine externo inferne dente parvo munito et ad basin abrupte angulato, margine basali cum dente, paululum majore, in medio munito, margine columellari superne callositate levi ad dentem parietalem juncto, reflexo et paululum obliquo, inferne acute angulato et dente valido munito.
Alt. $1 \frac{3}{5}$, diam. 2 mill. The other specimen measures, alt. $1 \frac{1}{2}$, diam. $1 \frac{1}{2}$ mill. (G.N.).

I obtained two fine specimens of this remarkable new species, by washing the larger shells obtained by Dr. Townsend in the Buket Pondong cave. I know of no shell which surpasses it in interest, as regards sculpture: the apical two whorls are smooth, the next closely, transversely sulcated, and the last two very conspicuously distantly so ; the "sulci" are almost upright, only slightly flexuous, with their interstices about twice as broad as themselves; underneath, the base appears beautifully fimbriated near the margin, owing to these sulcations apparently suddenly stopping a short distance from the periphery, though in reality one can trace them across the base ; but to do so requires the lens and a good light. To all appearance the middle of the base is smooth, polished and shining. These sulcations appear again within the deep, open, and solariform umbilicus, as conspicuous as ever. The characters of the aperture \&c. are so excellently represented in Colonel Austen's figure, that it would be a waste of time to further describe them (G.N.).

From the peculiar form of this shell, Mr. Nevill considered it a new subgenus of Ennea; and following his description of it he says:"It is of interest to note that, in the very extensive collection made by my friend Dr. Townsend in these caves, there was not so much as a broken piece of any species of Streptaxis or Ennea, both so
common in similar ground in the nearest known countries, Tenasserim and Penang."

I have deemed it best, considering that only two specimens were found, and that they are so similar in general form to immature specimens of Ennea stenopylis, Bs., from the Khasi hills, not to found this new subgenus until further examples are obtained proving that the shell as given in the Plate is a mature form ; and I trust Mr. Nevill will pardon this caution on my part (G.-A.).

Nanina (Microcystina) townsendiana, n. sp. (Plate LIX. fig. 1.)

Testa minutissima, N. minimæ (H. Adams, P. Z. S. 1869), a me detecta, affinis ; vix rimata, planiuscula, vitrea, nitida et lavis; anfract. $4 \frac{1}{2}$, perlente crescentes, sutura impressa sejuncti, ultimo majore, prope aperturam vix dilatato, ad peripheriam rotundato, basi convexiusculo; apertura minima, angusta, margine columellari perobliquo vix descendente.
Alt. $\frac{1}{3}$ (prox.), diam. 1 (prox.) mill. ( $G . N$.)
A small and almost microscopic form, which I obtained by washing larger shells found by Dr. Townsend in the Buket Pondong Cave. It belongs to a group which appears to me to abound nearly everywhere in the Indo-Malay Province, but which has hitherto been almost universally neglected, on account of the small size, and absence of marked sculpture and coloration, which characterize these shells. Species have nevertheless been described by MM. Issel (from Borneo), Martens, Semper, and Mörch (Eastern Archipelago), Benson (India and Burma), Morelet and H. Adams (Mascarene I.), \&c. I have not any books by me for reference; but I am almost confident that it was for a species of this group that Mörch, Journ. de Conchyl. for 1872, formed a new subgenus "MFicrocystina" (as distinct from the sculptured Microcystis, of Beck), with N. rinkii, Mörch, from the Nicobar Islands, as his type! Microcystina seems to me to bear somewhat the same relationship to the larger and closely allied mollusks known as Macrochlamys, that the European species of Vitrea (of Fitzinger) do to Hyalina (G.N.).
M. Crosse has described ${ }^{1}$ a new form from the same locality, $\Pi$. (Geotrochus) perakensis.

Clausilia? juv. (Plate LIX. fig. 8.)
Another young shell figured, which I doubtfully refer to the above genus (G.-A.).

Perak. (Indian Museum, Calcutta.)
Pupisoma? sp. juv. (Plate LIX. fig. 7.)
This shell I have figured although young, it being often of importance to know the immature forms, which so puzzle a conchologist when sorting out a collection. It probably belongs to the above subgenus of Stoliczka (J. A. S. B. 1873, p. 32).

Alt. 045 inch. ( $G_{0}-$ A. )
Perak. (Indian Museum, Calcutta.)
${ }^{1}$ Journ, de Conchyl. t. xir. p. 100, pl. viii. f. 4.

Acmella moreletiana, Nevill (Handl. Moll. Ind. Mus. 18:8, p. 251, Batti Malve). (Plate LIX. fig. 4.)

Testa minima, subaperte umbilicata, conico-turrita, hyalina, perlucida, polita atque nitida; circa regionem umbilicalem confertim plicata, plicis validis, regulariter incisis, prope suturam [sub "lente"] minutissime striatula, striis søpe haud videndis; anfract. $5 \frac{1}{2}$, convexiusculi, gradati, sutura excavata sejuncti, ultimo globuloso, inferne convexo; apertura perfecte rotundata, marginibus approximatis, sed haud continuis ; peristomate paululum incrassato, margine columellari sensim rotundato, umbilicum haud tegente.
Long. 2, diam. $1 \frac{1}{3}$ mil. (G.N.)
The late Dr. Stoliczka found this species in abundance on the little island of Batti Malve, twenty miles south of Car Nicobar. The regular distinct plications of the central portion of the base, which crowd the interior of the umbilicus, are a peculiar characteristic; in some of the scarcely mature specimens, under a strong lens, I can just detect near the suture, here and there, traces of a most minute striation ; otherwise the shell is of a perfectly smooth, polished, and translucent texture; the whorls are more convex than those of $A$. roepstorffana, the aperture higher in proportion to its breadth, with the columellar margin not bent abruptly back over the umbilicus, but evenly and gently rounded. Colonel Austen's figures of both these species are excellent, scarcely to be surpassed. The only possible criticism is that the margins of the aperture of this species, in especial, may to some appear continuous, which is not the case (G.N.).

Acmella roepstorffiana, Nevill (Handl. Moll. Ind. Mus. 1878, p. 25, Katchall, Nicobar Islands). (Plate LIX. fig. 5.)

Testa minima, peranguste umbilicata, conico-turrita, nitida, subtranslucida, sericina, omnino distincte, subconfertim et regulariter striata, striis acute filiformibus, obliquis, ad basin flexuosis, prope regionem umbilicalem paululum magis conspicuis; anfract. 5, gradati, vix convexiusculi, sutura excavata sejuncti, ultimo subcylindrico, ad peripheriam paululum compresso; apertura minima, subcircularis, peristomate incrassato, haud continuo, subobsolete duplici, margine externo perconvexo, margine columellari valide retrorsum arcuato plus minusve umbilicum tegente.
Long. $1 \frac{1}{2}$, diam. 1 mill. ( $G . N$.)
This small species, a few specimens only of which were found by the late Dr. Stoliczka at Katchall, one of the Nicobar Islands, is distinguished from all the other described species of the genus by its being throughout regularly, rather strongly striated, the striæ being acute and "thread-like;" the shell is of a silky, translucent and shining texture, with 5 almost cylindrically turreted whorls, the last a trifle compressed at the periphery ; the umbilicus is exceedingly narrow and partially overlapped by the thickened peristome, which here and there, under the lens, clearly shows a duplex character; the aperture is very small, unusually broad in proportion to
its height, and almost circular, with the margins almost but not quite continuous, the columellar one being abruptly bent back over the umbilicus, and then beautifully and boldly rounded. I named this interesting little species after my friend Mr. F. A. de Roepstorff, Dep. Sup. Andaman-I. Commission, to whom both the Museum at Copenhagen and myself are indebted for many interesting Mollusca and Coleoptera from the Andaman and Nicobar Islands (G. N.).

Opisthostoma perakensis, n. sp. (Plate LX, figs. $1,1 a, 1 b$.)
Shell dextral, much depressed, ovate, the last whorl reflected half a turn back and rising to a level with the penultimate suture ; colour ruddy brown; sculpture fine ribbing, wide apart and regular to the apex. Spire depressed, sides parallel, apex flat, suture deep. Whorls 4 , sides convex; penultimate and autepenultimate equal, the last reversed. Aperture circular, vertical; peristome donble, inner lip circular, continuous; the outer lip angular below.

Size, alt. 0.30 , major diam. 0.33 in.
Perak. (Indian Museum, Calcutta.)
Two examples of this very curious extremely minute shell were discovered by Mr. G. Nevill when washing out some of the larger specimens of the sbells from the limestone caves, showing how often such delicate small species must be overlooked and lost by collectors ( $\boldsymbol{H} . H_{\text {. G }}$.-A.).

Opisthostoma pauluccie, Crosse and Nevill, Journ. de Conchyliologie, t. xix. pp. 197 \& 205 (1879), pl. viii. fig. 1. (Plate LX. figs. 2, 2a, 2b.)

Shell dextral, very depressed, ovate, the last whorl reflected more than a half turn backwards and rising to the top of the antepenultimate whorl; colour ruddy brown; the ribbing strong and wide on the last two whorls, very close and fine on those above. Spire depressed, sides parallel to axis, apex flat, suture moderately impressed. Whorls 4 , penultimate and antepenultimate equal, their sides flat, the last whorl rounded and reversed. Aperture triangular, subvertical. Peristome double, both inner and outer lips.

Size, alt. $0 \cdot 30$, major diam. 0.33 in .
Perak. (Indian Museum, Calcutta.)
This shell, a close ally in size and form of 0 . perakensis, presents a few characters by which it can be easily distinguished. I have, however, only seen one specimen, which was found in a similar way to that above described. Mr. Nevill informed me, before leaving for India, that this shell had been described by M. H. Crosse from a specimen he had sent him (G.-A.).

Diplommatina crosseana, n. sp. (Plate LX. figs. 3, 3a.)
Shell dextral, elongately fusiform, sculpture widely and regularly costulate, colour pale sienna-brown; spire gradually decreasing, suture moderately impressed. Whorls 7; antepenultimate the largest and most swollen ; penultimate short, from the last rising rapidly on it ; constriction behind the aperture. Aperture rectangular, sub-
vertical; the columellar margin perpendicular, with usual tooth. Peristome double, slightly sinuate on the outer margin, viewed from side.

Size, alt. 0.054 , diam. 0.03 in . (G.-A.).
Perak. (Indian Museum, Calcutta.)
Diplommatina (Palaina) mirabilis, n. sp. (Plate LX. figs. 4, 4a, 4b.)

Shell dextral, solid, elongately pyramidal; colour pale umberbrown; sculpture regular ribbing in high relief : this costulation on the basal side is not continuous up to the columellar margin, but the epidermal layer terminates on a defined line level with the upper angle of the aperture and encloses thus a lunular smooth area very characteristic of this species. Spire rapidly decreasing, sides flat, apex pointed, suture well impressed. Whorls 7, the penultimate the largest, sides convex. Aperture subvertical, straight on the outer margin, broadly ovate ; columellar margin straight, the tooth of flattened form. Peristome continuous, closely double.

Size, alt. 0.07 inch, maj. diam. $0.04 \mathrm{in} .\left(G_{0}-A_{0}\right)$
Perak.
Of this very distinct and beautifully formed shell only one specimen was found. It presents characters which show a decided departure from the subgenus Palaina; and no doubt other allied species will eventually be found in this area.

Diplommatina (Palaina) superba, n. sp. (Plate LX. figs. 5, 5a.)

Shell sinistral, elongately pyramidal, very solid; colour ruddy ochre; sculpture fine close costulation, waved on the periphery of the last whorls, the apical whorls smooth. Spire very pointed, suture deep. Whorls $7 \cdot 3$, last very angular, almost keeled; the antepenultimate the broadest; the penultimate the most swollen. Aperture large, circular, very oblique. Peristome much thickened, widely double; the inner lip continuous; the outer angular on the outer margin, rounded below.

Size, alt. 0.094 , maj. diam. 0.06 in . (G.A.)
Perak.
This is a very beautiful small species of Palaina; only one specimen was obtained.
(Indian Museum, Calcutta.)
Diplommatina (Palaina) nevilli (Crosse, Journ. Conch. t. xix. p. 205, pl. viii. f. 2), Lagocheilus townsendi (Crosse, l. c. p. 200, pl. viii. f. 3), and Alyccus perakensis (Crosse, l. c. p 206, pl. viii. f. 7) were also obtained by Dr. Townsend.

Georissa monterosatiana, n. sp. (Plate LIX. fig. 6.)
Testa parva, sat tenuis, imperforata, fulva; apice lavi, corneo atque conspicue prominente; anfract. 5, convexi, celeriter crescentes, concentrice confertimque sulcati, sulcis minutis et regularibus,
ultimo maximo, rotundato, basi vix convexo; apertura superne contracta, inferne late dilatata, margine columellari callose incrassato, retrorsum paululum deflexo, margine externo convexe rotundato.
Long. $2 \frac{1}{2}$ (vix), diam. $17 \frac{7}{8}$ mill.
Another shell found in the same locality by Dr. Townsend. The sculpture and characters of the aperture are admirably represented by the figure ; the last whorl but one, however, should be considerably more convex and consequently less turreted and less conspicuous; the base of the last whorl is a shade too convex, giving the shell an umbilicate appearance, which it does not possess (G. N.).

Georissa semisculpta, n. sp. (Plate LIX. figs. 3, 3 a.)
Testa parva, solida, viridescens, imperforata; anfractu antepenultimo valide sulcato, sulcis concentricis atque approximatis, ultimo subcompresso, basi planiusculo, superne concentrice valideque sulcato, inferne lavi; apertura superne perangusta, inferne late dilatata, maryine columellari incrassato, abrupte retrorsum deflexo ac callositate validissima regionem umbilicalem tegente instructo, margine externo inferne subangulato.
Diam. (ult. anfract.) 2 mill. ; alt. apert. $0^{\circ} 05$ inch.
A single mature specimen, with the spire unfortunately broken, was found by Dr. Townsend in the Buket Pondong cave in Perak. It differs so conspicuousiy from every other known species, and would be so easily recognized again, that I have not hesitated to describe it, though I do not usually do so when I possess only a unique specimen. The figure is perfect ( $G . N_{0}$ ).

## EXPLANATION OF THE PLATES.

Plate LIX.
Fig. 1. 1a, 1b. Microcystina townsendiana, n. sp., $\times 20, \mathrm{p}, 736$.
2. Ennea perakensis, n. sp., $\times 8$, p. 735.
3. 3 a Georissa semisculpta, n. sp., $\times 12$, p. 740.
4. Acmella moreletiana, n. sp., $\times 24$, p. 737.
5. - roepstorffiana, n. sp., $\times 24$, p. 737.
6. Georissa monterosatiana, n. sp., $\times 12$, p. 739.
7. Pupisoma?, young, $\times 24$, p. 736 .
8. Clausilia ?, young, $\times 24, \mathrm{p} .736$.

Plate LX.
Fig. 1, $1 a, 1$. Opisthostoma perakensis, n. sp., $\times 24$, p. 738.
$2,2 a, 2 b$. - pauluccie, $\times 24, \mathrm{p}, 738$.
3, 3 a. Diplommatina crosscana, n. sp., $\times 24, \mathrm{p} .738$.
$4,4 a, 4 b$. - mirabilis, n. sp., $\times 24, \mathrm{p} .739$.
5, 5 a. Palaina superba, n. sp. $\times 8$, p. 739.

## 6. Notice of a Collection of Mammals and Reptiles from

 Cyprus. By Dr. A. Günther, F.R.S.[Received November 12, 1879.]
Lord Lilford has recently received from one of his collectors a small collection from the island of Cyprus, and has kindly submitted the Mammals and Reptiles to me for examination. The species are the following, those new to the fauna of Cyprus being marked with an asterisk.

## 1. Cynonycteris collaris.

In the list of Cyprian animals compiled by Kotschy and published in Unger and Kotschy's 'Die Insel Cypern,' Pteropus agyptiacus (Cynonycteris agyptiaca) is enumerated as one of the two bats ${ }^{1}$ then known from the island; and, indeed, from the occurrence of this species in Egypt and in Syria, the fruit-eating Bat of Cyprus might have been expected to be that species. However, singularly enough, the Cyprian specimens (of which thirty-eight are in the collection) exhibit the distinctive character (a somewhat shorter thumb) on account of which $C$. collaris has been separated from C. cgyptiaca ${ }^{2}$. C. collaris has been found hitherto only in South Africa and on the Gaboon ; and before we admit so singular a distribution of two representative species we must feel disposed to question the specific value of the character by which the two forms have been separated.
*2. Vesperugo kuhlit. Two specimens.
*3. Mus alexandrinus. Two specimens.
*4. Acanthodactylus bosicianus. One specimen.
*5. Ophiops elegang. Eight specimens.
6. Stellio cordylina. Numerous specimens.
7. Chameleon vulgaris. One specimen.
8. Zamenis atrovirens, var. carbonaria. Two specimens.
9. Tropidonotus natrix. One specimen.
10. Ceqlopeltis lacertina. One specimen.
11. (? Vipera lebetina, L.) = Vipera euphratica, Martin, $=$ Vipera mauritanica, Dum. \& Bibr. Two specimens ${ }^{3}$.
*12. Hyla arborea. Four specimens.
13. Rana esculenta. One specimen.
${ }^{1}$ The second is Vespertilio murinus.
${ }^{2}$ Mr. Dobson, who has examined the specimens, agrees with us in considering them to be C. collaris.
${ }^{3}$ The larger of these specimens had in its stomach the remains of a species of Saxicola (?). This is a very rare instance of a viperine snake swallowing a bird.

# 7. On the Fishes of Weston-super-Mare. By F. Day, F.Z.S. 

[Received November 18, 1879.]

## (Plates LXI. \& LXII.)

Having visited Weston-super-Mare in July this year, and remained there throughout most of August, I directed my attention to the sea-fishes of that place, which, situated on the estuary of the Severn and the Wye as it enters the British Channel, is a locality too well known to call for any description: for the same reason I have deemed it unnecessary to allude to the remarkably high spring tides which occur. The amount of fishing going on was inconsiderable, boating apparently being a more profitable occupation. The shrimpers were daily at work; while stakes in narrow passes permitted the erection of stationary nets, into which small fishes and Crustacea were swept by an ebbing tide. Here I obtained most of my specimens; but the place so swarms with crabs (Carcinus mœnas, Linn.), that numerous little fishes were found partially devoured when the tide had ebbed sufficiently to permit the nets being examined. During the end of the first week in August, enclosures of a semicircular form were erected on the sands for the purpose of capturing flat fish (Pleuronectids). The one that appeared to be most successful was about 200 yards in length, the stakes raised to about three feet above the ground; and to these a long net was affixed.

I daily went to the stake- and shrimp-nets, as well as to the enclosures on the sands already referred to.

In drawing up this paper I took as my groundwork Mr. W. Baker's (of Bridgewater) 'Fishes of Somersetshire,' ${ }^{1}$ including Mr. Higgins's ${ }^{2}$ Remarks upon the Fishes of Weston-super-Mare, which he collected between the end of June and November 27, 1860. I likewise examined the specimens in the Taunton Museum, and the more extensive collection in that of Weston ${ }^{3}$.

The fishermen complained that the season had been an unprecedently bad one, but that at times fishes had appeared most unexpectedly. This they could not account for, nor even propose any solution. Later on (September) large numbers of Soles were found to be present in the Channel, which had not been suspected; and many that were taken weighed as much as four pounds each.

Reports from various sources lead one to the conclusion that

[^67]


the migration of marine and littoral species of fish this year has been rather peculiar. Along the coast of France some forms have almost forsaken their usual haunts, but appeared in other stations, from which they had in former seasons been almost absent. Captain Salmond, of the 'Charlotte and Jane,' observes, respecting his fishing-voyages to the North Sea this year:-"It turns out, up to the time I write (June 2nd), that it is a failure in regard to Soles; also the offal is not so plentiful as in other summers. At Heligoland the fishermen have had a bad time, some being on the brink of starvation." It was stated in the papers during October that "Eastern Siberia has been suffering from famine, no whales or fish having visited those waters this summer."

Temperature is well known to exert a great influence on the migration of fishes, while we are aware of having experienced a long and severe winter, followed by a very cold spring and a comparatively colder summer. This may to a considerable extent account for the abnormal manner in which the distribution (not general supply) of marine forms has occurred throughout the last season. I therefore deem it advisable to give the temperature of the air as observed at the Royal Observatory, Greenwich, and for which I am indebted to W. Ellis, Esq.

## Deviation of Mean Temperature from Average of 20 Years.

| November 1878 |  | $-\stackrel{0}{3} 0$ |
| :---: | :---: | :---: |
| December |  | $-7 \cdot 1$ |
| January | 1879 | $-6.9$ |
| February | , | $-1.5$ |
| March | " | $-0.3$ |
| April | " | $-4 \cdot 3$ |
| May | " | $-4.7$ |
| June | " | $-2.9$ |
| July | " | -4.5 |
| August | , | $-2.0$ |

The above figures show that the temperature of the air has been below the average of that experienced during the last twenty years in every month referred to.

While engaged on this paper, by the kindness of the Earl of Ducie, F.R.S., I have been permitted to examine and make use of the diary kept by his lordship while on the yachting-tours which he has for several successive seasons made to Ballinskellig Bay, in Ireland, situated on the same latitude as Greenwich and Weston-super-Mare. The notes are so complete and interesting that I cannot but regret merely giving a summary, for such accurate data are probably unattainable elsewhere. During the last four years fishing has been done from a 30 -ton cutter, but in 1873 and 1874 from yacht-boats. The takes have been as follows:-

| Species. | 1873. | 1874. | 1876. | 1877. | 1878. | 1879. |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Red Mullet | 27 | 11 | 1 | 4 | 1 | 2 |
| Sea-Bream. | 61 | 13 | 176 | 210 | 57 | 1 |
| Red Gurnard. | ... | ... | 20 | 18 | 12 | 7 |
| Sapphirine Gurnard | ... | ... | 24 | 29 | 59 | 71 |
| Grey Gurnard | $\ldots$ | ... | 95 | $5 \pm$ | 78 | 178 |
| Piper .......... |  |  | 4 | 1 |  | 9 |
| Mackerel | 222 | 118 | 110 | 2 | 108 |  |
| Dory | 1 | 4 | 5 | 4 | 5 | 27 |
| Cod, over 5 lb . |  |  | 14 | 4 | 4 | 3 |
| Whiting. | 84 | 124 | 170 | 306 | 114 | 310 |
| Whiting Pout | 95 | 10 | 32 | 6 19 | 12 | 11 |
| Pollack, over 4 lb Hake ............ | $\ldots$ | ... | 33 | 19 | 43 | 1 |
| Ling | 9 | 13 | 22 | 23 | 15 | 14 |
| Turbot | 1 | 4 | 15 | 115 | 47 | 57 |
| Brill | 4 | ... | 16 | 29 | 34 | 92 |
| Whiff. |  |  | 7 | 7 | 2 | 4 |
| Plaice. | 51 | 147 | 199 | 582 | 374 | 1032 |
| Dab | ... | ... | 56 | 77 | 54 | 326 |
| Lemon Dab | .. | ... | 13 | 8 | 5 | 20 |
| Flounder |  |  | 19 | 43 | 51 | 38 |
| Sole | 51 | 147 | 250 | 289 | 403 | 683 |
| Lemon Sole |  |  | 7 | 9 | 7 | $\stackrel{2}{2}$ |
| Conger | 86 | 56 | 22 | 29 | 43 | 6 |

If we divide the fishes captured in the years 1878 and 1879 into families, we find as follows:-


One cause which has great bearing upon the presence or absence of certain kinds of fish is, as already observed, the temperature of the sea. The following figures from Lord Ducie's notes show what was the average temperature at the surface daily at 7 A.m. : -


Consequently in July 1879 we find the temperature of the air was $4^{\circ} \cdot 5$ lower than the average of the mean temperature for the last twenty years, and of the surface-water of the sea $9^{\circ} .5$ less than in 1878 ; while in August the mean temperature of the air was $2^{\circ} .0$ less than the average for the last twenty years, and of the surfacewater of the sea $5^{\circ}$ lower than in 1878.

On July 21, 1878, at 12.30 A.м., the temperature of the sea is thus recorded:-At surface, $71^{\circ}$; at 1 fathom, $67^{\circ} .5 ; 2$ fathoms, $66^{\circ}$;

3 fathoms, $65^{\circ} ; 4$ fathoms, $63^{\circ} ; 5$ fathoms, $61^{\circ} ; 6$ fathoms, $60^{\circ}$; 7 fathoms (at bottom), $59^{\circ}$.

If I now confine my figures to the temperature and species of fishes taken by trawling solely in Ballinskellig Bay in 1878 and 1879, I find as follows:-Trawling was only employed on four days in July 1878, in from 3 to 5 fathoms of water, with the surface-temperature at 7 А.м. $60^{\circ}$ to $62^{\circ}$, or having an average of $61^{\circ}$ : the total captures were:-7 Sapphirine Gurnards; 1 Dory; 18 Turbot; 11 Brill; 99 Plaice; 11 Dabs; 11 Flounders; 155 Soles; 2 Lemon Soles. In August 1878 trawling was employed on 15 days, with the surface-temperature at 7 A.m. $60^{\circ}$ to $64^{\circ}$, giving an average of $62^{\circ}$. It was remarked on August 7th that four scrapes were taken with a 16 -foot beam-trawl, and that the Plaice captured nearly doubled the Soles in number, probably due to the speed at which the boat was driven, and to the elevation of the "head-rope" abore the ground, as effected by the trawl-beam. Two of the scrapes were in 3 fathoms and two in 5 fathoms of water; but there was no very marked difference in the result. The total captures in the 15 days of August were as follows:-1 Bass ; 2 Sea-Bream; 31 Sapphirine Gurnards; 3 Grey Gurnards; 4 Dory; 18 Mackerel; 34 Turbot; 28 Brill; 194 Plaice; 25 Dabs; 23 Flounders; 246 Soles ; 1 Lemon Sole.

In the year 1879, trawling was employed for 12 days in July, with the surface-temperature at 7 A.m. $50^{\circ}$ to $56^{\circ}$, having an average of $53^{\circ} \cdot 9$. The total captures were:-1 Sea-Bream; 2 Sapphirine Gurnards; 2 Grey Gurnards; 8 Dory; 2 Angler; 2 Ling ; 25 Turbot; 32 Brill; 393 Plaice; 117 Dabs; 4 Lemon Dabs; 2 Flounders; 229 Soles; 1 Lemon Sole; 4 Whiffs. During August trawling was carried on 11 days, with the surface-temperature at 7 A.Mr. $54^{\circ}$ to $58^{\circ}$, having a mean of $56^{\circ} \cdot 5$. The total captures were:-9 Sapphirine Gurnards; 5 Grey Gurnards; 4 Piper; 12 Dory; 1 Angler; 19 'Turbot; 45 Brill; 448 Plaice; 137 Dabs; 5 Lemon Dabs; 4 Flounders; 269 Soles. We find, therefore, that the fishes captured in the two years were about as follows:-


[^68]There appear to have been less Gurnards taken in the 21 days' trawling in 1879 than in the 19 days in 1878; more Dory ( 9 instead of 5); no Mackerel (in place of 18 in 1878); but a very much larger number of Pleuronectoids, 1614 in place of 860 in 1878. Still one must not attribute the increase of Soles caught entirely to a local augmentation in the number of fish in the sea, as, in the first place, the "sweep" of the trawl was as 5 to 4 , being 50 feet "spread" in 1879 instead of 40 feet in 1878. The bridles, i.e. the ropes to the "Otter heads," or weighted wooden kites, which run along the bottom, were rather better adjusted in 1879; while the weather for working the trawl was more propitious, consequently it was more frequently employed. A depth of about 5 fathoms was found to be most favourable in 1879, whereas in warmer seasons 3 to $3 \frac{1}{2}$ fathoms have been found to yield the best captures. The facilities for the different kinds of fishing varied with the weather: thus the takes of Whiting show fine weather, when line-fishing could be attempted outside the Bay.

Although many deductions might be drawn from Lord Ducie's notes, I propose deferring them for the present, in the hope of obtaining the general returns of the sea-fisheries of the United Kingdom. It would, however, appear that among the Soles and flat fishes generally, striking anomalies in distribution have occurred during the past season. They would seem to have more or less forsaken (for a time, at least) the North Sea, and to have appeared in augmented numbers on the S.W. coast of Ireland and the Bristol Channel. Whether the temperature of the sea in certain localities has been so low as to cause the migration of the food of these fishes, or the fishes themselves have been acted on by cold, through the medium of the water, or both causes have combined, are questions worth investigating, but which I propose to defer for the present.

Passing on to the fishes themselves, I have added remarks to many species, frequently made, as will be observed, in other localities than at Weston.

Labrax lufpus, Lacép. The Bass.
I obtained several small examples, none of which exceeded a pound in weight. All were from the stationary shrimp-nets. It is observed, in Lord Ducie's diary, on August 10, 1878, that "in the North Bay the Bass were hunting the Sprats to the surface, the Gulls assisting. This went on all day, along the strand up to the embouchure of the Jung River."

## Polyprion cernium, Val. Stone-Bass.

Somersetshire (Baker).

## Mullus surmuletus, Linn.

M. barbatus, De La Roche.

## Somersetshire (Baker).

Lord Ducie took two examples on August 2nd this year in a trammel set in Ballinskellig Bay; while one was likewise similarly captured July 26, 1878.

Pagrus vulgaris, Cuv. \& Val.
Somersetshire (Baker).
Pagellus centrodontus, De La Roche. Sea-Bream.
Somersetshire (Baker).
Cottus scorpius, Bloch. Sting-fish or Sea-Scorpion.
This fish is taken at Weston during the winter. I have received several examples, captured at Southend, at the mouth of the Thames, from Mr. Carrington, naturalist to the Royal Westminster Aquarium. The spines at the preopercular angle are occasionally reduced from three to two, while the usual number of the dorsal spines is 10 , and of the anal rays 10 instead of 11 or 12.

Cottus bubalis, Euphr. Father Lasher or Long-spined SeaScorpion.
C. greonlandicus, Cuv. \& Val. ; C. labradoricus, Girard ; C. ocellatus, Storer.

The American form or variety is said to have " the ridges of the bones of the head tubercular, not covered with skin" (Günther, Catal. ii. p. 165). I find the same appearances in some examples received from Southend. The variety of Cottus scorpius mentioned by Couch as having a " row of tendrils hanging from the skin above the eyes" was probably an example of this species, which usually has a few short tentacles about the head and above the eyes, while there is frequently rather a large one at the outer end of the maxilla.

Trigla cuculus, Linn. Elleck or Red Gurnard.
T. pini, Bloch.

Occasionally taken at Weston.
Trigla lineata, Gmel. ; Linn. Streaked Gurnard.
This, as well as the next two, are occasionally captured. This fish is said to be very seldom taken by a bait. Mr. Cornish ('Zoologist,' 1878, p. 423) observes that it is mever taken on a hook. At the Westminster Aquarium I observe that these fishes become quite as tame as the other forms, taking pieces of mussel or shrimps as well as any other fish, and apparently with as little fear.

Trigla hirundo, Bloch. Sapphirine Gurnard.
T'. pociloptera, Cuv. \& Val.
Trigla gurnardus, Linn. Grey Gurnard.
T. cuculus, Bloch ; T. blochii, Yarrell.

I received one example from Mr. Carrington, captured at Southend, in which the white spots have run into narrow and sinuous lines, while a black blotch, surrounded by a light ring, exists on the first dorsal fin. The colours in this species vary exceedingly : in some there are no white spots, the upper half of the body being of a slate-grey, conjoined with which a black blotels usually exists on
the first dorsal fin (T. blochii). This dorsal blotch, however, as a rule, is present in all specimens, although in some it is faint, or merges into the colour of the remainder of the fin, while it frequently becomes lost in examples kept long in spirit. Occasionally the dorsal blotch instead of being round is semicircular.

This is said to be the most common form of Gurnard at Weston ; but none of the genus were captured when I was there. Although Couch observes that T. gurnardus is less sensible to variations in temperature than any other form of British Gurnard, it is found to be the most difficult to keep alive in the Westminster Aquarium.
Trigla lyra, Linn. The Piper.
Somersetshire (Baker).
Scouler (Mag. Nat. Hist. vi. 1833, p. 529) states this fish not to be rare at Glasgow, where it sometimes attains to 7 lb . weight. Lord Ducie found it this year more abundant than usual in Ballinskellig Bay, where in August he obtained nine with the trawl, in 1878 none, in 1877 one, in 1876 four.

Agonus cataphractus, Linn. The Pogge.
A local example exists in the Weston Museum.
Trachinus draco, Limi. Great Weever.
A single local example in the Weston Museum.
Trachinus vipera, Cuv. \& Val. Little Weever.
I obtained a single specimen from the stationary fish-nets. The fishermen professed to regard these fish as very rare.

Scomber scomber, Linn, The Mackerel.
A few (adult) are occasionally taken near Weston. Mr. Dunn, of Megavissey, observes (MS.) that "many have the fins of the belly red. Our fishermen carefully note them, as when they appear quantities of fish are always off the coast. *** Their ova float on the surface of the sea. *** During the month of September this ycar some hundreds of a fish-louse (Rocinela dannoniensis ${ }^{2}$ ) have been found on the Mackerel at Megavissey; all I have noticed or heard of have, except in one instance, been taken from near the pectoral fins; the one excepted was imbedded in a wound near the vent of the fish. These 'Lice,' as our fishermen call them, visit our coasts in countless millions in the spring months of the year; they seldom come nearer than 3 miles from the shore, and remain on the sea-bottom. Sea-Bream eat them readily."

In the 'Field' (August 9th) is an account of another Isopod, Fga tridens, and its carnivorous propensities. It is there stated, by both Mr. Tudor and Mr. Anderson, that in Shetland they attack the fish caught on the long lines, when laid on certain sandy bottoms or grounds, and, getting in through the gills, it is supposed, eat up the inside of the fish without destroying the skin or bone, so that

[^69]when the fish is hauled up it looks as plump and round ns a live fish, but when opened is found full of these parasites.

Mr. Dunn subsequently (Sept. 29th) observes, "the statement in the 'Field' is quite in keeping with our knowledge of these fishlice. We have no deep-sea long lines in use here; our deep-sea fishing is done with hand-lines; consequently we have no opportunity of testing the habits of the 'lice" in a like manner with the northern fishermen. But it often happens when a half Mackerel is used as a bait that the lice will in a few minutes scoop out all the fish, leaving nothing but the skeleton and the skin. To a novice, the bait will appear as round and full as when first cast into the sea, so closely packed are the lice in the body, but a hard rap against the side of the boat reveals the secret. They give out a ticking sound when crawling."

## Zeus faber, Linu. John Dory or Doree.

I obtained two from the stationary shrimp-nets. This fish has numerous yellow lines taking an irregular horizontal direction along the body, a very light edging to the black lateral blotch, and two darkish lines along both dorsal and anal fins. At the Westminster Aquarium these fish are fed upon Sand-Smelts; and one day, being perhaps more hungry than usual, a Dory was observed to seize a young Bass, which it subsequently devoured. Mr. Saville Kent drew attention to the peculiar manner in which this fish uses its fins, which he, with great justice, likens to that of the dorsal fin in the Pipe-fish, a movement that Dr. J. E. Gray considered resembled the action of the Archimedean screw. This rapid motion affects the soft rays and interradial membrane of the dorsal, anal, and pectoral fins, all, or merely some, of which may be in motion at the same time. This may be perceived both when they are ascending or descending, or even when lying over on one side; but they are likewise able to move their fins more slowly, as we generally perceive in fishes.

The Dory appears to have been more common this year than usual. Turning to Lord Ducie's captures, I find them in Ballinskellig Bay as follows :-1873, one ; 1874, four ; 1876, five; 1877, four; 1878, fire; 1879, twenty-seven.

## Cafros aper, Linn. The Boar-fish.

An example, $5 \frac{1}{4}$ inches in length, is in the Weston Museum ; it was brought there alive. Large numbers have been captured this year off the English coast ; and Mr. Carrington observes that he has received notices, during June 1879, of their having been taken in various parts of the south and south-east coast of England. At Weymouth and Bournemouth they were not infrequently found dead on the shore. At Sheerness a shrimp-trawler took a dozen at one draught; off Harwich a pair were similarly captured. The Essex fishermen term them 'Red Dorees,' but do not remember observing them in previous years. In the commencement of September, about a dozen were captured in one day on the south coast. Mr. Dunn sent me a fine example from Megavissey, November this year. On
examining it, I found three cecal appendages, whereas this fish is asually stated only to possess two.

## Xiphias gladius, Linn. The Sword-fish.

The cast of an example exists in the Weston Museum, taken by Mr. Mable from a specimen 9 feet long, which was captured near the town, at Burnham, in the summer of 1873. Its snout and fins are likewise preserved. On its left side, opposite the hind edge of the first anal fin, existed a large cicatrix, evidently due to a wound, which had nearly transfixed the fish, there being a spot on the opposite side showing to where the injury had extended. It does not seem improbable that this wound may have been inflicted by another individual of the same species. In the daily newspapers the capture of one of these fish in the $W_{y e}$, on October 9 th, is announced. It strayed up during the night, and was left stranded at Chepstow on the ebb making. Length 8 feet 6 inches; snout 3 feet long; weight 200 lb .

I was particularly desirous of examining the Gobies of Weston, as Couch has figured and described several supposed new species or Mediterranean forms from that locality. Every ichthyologist will admit the difficulty of solving questions of species, especially among Gobies, when the author omits to mention the number of the fin-rays, makes no remarks on the scales or teeth, while the size of the published figures does not accord with that of the specimen as described in the text. Finding myself completely at a loss, I determined to collect these fishes at Weston, whence the Yellow Goby, the One-spotted Goby, the Speckled Goby, the Transparent Goby, and the Slender Goby had been obtained. While demurring to the value of some of these species, it must not be overlooked that in the following identifications of Couch's text and plates I have had to be guided very considerably by colour and form, while, on the other hand, our examples came from the same locality.

Gobius minutus, Gmel., Linn. ; Donovan, pl. xxxviii. ; Yarrell ; Parnell.

This species was very numerous; some examples agreed with $G$. unipunctatus, Parnell, and One-spotted Goby, Couch, and probably G. yracilis, Jenyns; while the Tail-spotted Goby of Couch is perhaps the young.

Gobius ruthensparri, Euph.
Not uncommon. Couch's Two-spotted Goby is this species, while his Broad-finned Goby may be the male.

Gobius rhodopterus, Günther.
Not rare. It is identical with $G$. minutus, Couch, and $G$. gracilis, Parnell and Yarrell (not Jenyns). The female differs considerably in colour from the male, while its fins are lower. It appears to be the Yellow Goby of Couch, not of Risso.

Couch gives a Transparent Guby and a Slender Goby, which may be examples of Latrunculus albus, a fish he considered "as the young of some better known species."

Callionymus lyra, Linn. C. dracunculus, Linn. (female). The Dragonet, Gemmous and Sordid Dragonets.

This fish is taken off Weston, but only the male exists in the Museum. Mr. Sandford, to whom I am indebted for assistance in my investigations at the excellent Taunton Museum, informs me that the Skulpin is very good eating.
Cyclopterus lumpus, Linn. Lump-sucker.
This fish is said to arrive in the cold months, and commits considerable havoc among the sprats.
"Watching a Lump-sucker firmly attached to the glass of the tank, the idea occurred to me that the sucker may have been developed by natural selection, as a useful adjunct to the breathing movements of the fish. When fixed, the fish appears to be perfectly at ease, and to breathe more fully and strongly than when swimming. The movements of the opercles or gill-covers, when the fish was attached, were specially strong, as compared with their motion in the act of swimming. In a large-headed and heavy-bodied fish, like Cyclopterus, any aid given to the respiratory movements would be a clear gain to the animal ; and from a habit of simply resting on a object, so as to afford leverage and play to the gills, the comparatively useless ventral fins may have become specially modified as a disk of attachment ; the development of the suckingdisk, and enlargement of the branchial cavity, would thus proceed pari passu, and by natural selection the present exaggerated features of both organs would be attained." (A. Wilson, ' Nature,' June 26, 1879, p. 197.) I would suggest that this modification of the ventral fins into a sucker (as we observe the first dorsal similarly modified in Echeneis) is principally for adhesion, either to prevent their being carried away by the tide, or to attach themselves to their prey. A heavy body, as a Lump-sucker, violently rolled over by a strong wave, would be liable to suffer considerable injury. As a proof of this I would refer to Dr. McIntosh, who observes that after storms these fishes are found on the west sands of St. Andrews.

Liparis vulgaris, Flem. Sea-Snail.
Small examples I found exceedingly common at Weston, several being almost invariably present in every shrimp-net, while the crabs appeared to be uncommonly fond of them, few being uninjured. In none could I see any blue lines. Large examples are said to be common in the winter.

Lifaris montagui, Donovan.
Has been recorded from Somersetshire.
Lophius piscatorius, Linn. Angler; Fishing-Frog.
Every two or three years a large one is taken at Weston. The
cast of one 4 feet long is in the Museum, as well as the jaws of two or three adults.

Cepola rubescens, Linn. The Band-fish.
Somersetshire (Baker).
A specimen from Exmouth, captured this year and given me by Frank Bucklaud, Esq., was infested with worms, which Mr. Cobbold found to be examples of Rudolphi's so-called Nematoideum cepola-rubescentis. Six different internal parasites have been described from this fish.

Blennius gattorugine, Bloch.
Local examples of this Blenny are in the Museum.

## Atherina presbyter, Cuv. Sand-Smelt.

Mugil capito, Cuv. The Grey Mullet.
I saw an example nearly three feet long, taken out of the flounderstakes, they are said not to be commonly seen, but occasionally sinall schools of them are captured in the stationary shrimp-nets. At the Westminster Aquarium, those in the same tank as the Sturgeou greedily devoured lob-worms; their food is chopped mussels.

Mugil septentrionalis, Günther. M. chelo, Yarrell.
Has been recorded from Somersetshire.
Gasterosteus aculeatus, Will. The Tinker.
I obtained an example from the stationary shrimp-nets, others likewise exist in the Museum. Baker records the following varieties as found in the county :-G. trachurus, C. \& V.; G. semiarmatus, C. \& V.; G. leiurus, C. \& V., or G. gymnurus, Cuv. Although these Sticklebacks (or Pricklebacks, as they were formerly called) are taken in both fresh and sea water, Mr. Mable found that in an aquarium they rarely lived in salt water upwards of six weeks, and even then they did not thrive. Having obtained upwards of a score, he placed them in a freshwater aquarium, which was apparently too small for all to live in together with comfort ; consequently some of the weaker were eaten by the stronger and larger ones. 'I'his could not have been due to want of food, as they had as much as they wished for; what they especially seemed to relish was butter, to obtain which they would even spring out of the water. They became exceedingly tame, and were fed with dried beef shredded, which they would take from the hand, but preferred Mrs. Mable to any one else ; in fact she had only to hold a finger over the aquarium, and they would at once come and follow it as she moved it along. Some of the most brilliant males took and retained particular stations, and from which they drove away interlopers. They constructed nests of small bits of twigs, which they carried in their mouth like birds to the place where they desired to form their domicile, which was invariably laid on a sandy foundation. As soon as a piece of stick or other substance had been deposited, the fish carried some
sand in its mouth and strewed it above; then taking in some more sand, it went a short distance off and blew it over the structure, thus causing it to be diffused in a shower of bubbles. The nest when completed had its entrance on one side and its exit on the other, as has been described by Dr. Ransom and other observers ; this nest, if lifted out of the aquarium, appeared to be glued together by a jellylike substance. Mr. Warrington (Ann. \& Mag. Nat. Hist. 1855, (2) xvi. p. 330) remarks that the adult die when they have propagated their species.

Some Roach, Leuciscus rutilus, were added to the inmates of the aquarium, with which invasion the Sticklebacks did not appear to be pleased; still they were not frightened, but forthwith attacked the intruders, biting at them anywhere and everywhere, until they became thoroughly cowed. Then these little tyrauts were observed to place themselves in front of the Roach, steady themselves by their tail, and then suddenly dart straight at the lips of their intended prey, from which they bit pieces out. These attacks were continued until the Roach had been killed, when they were eaten by their conquerors.

Gaterosteus spinachia, Linn. Fifteen-spined Stickleback.
A local specimen exists in the Weston Museum.
Labrus maculatus, Bloch. The Ballan Wrasse.
Two local examples exist in the Weston Museum; they were received alive.

Labrus mixtus, Fries, the Cook; Labrus comber, Pennant; Crenilabrus melops, Linn., the Corkwing; Gymnelis imberbis, Linn., the Beardless Ophidium. Have all been taken in Somersetshire.

Ammodytes lanceolatus, Le Sauvage. The Greater Sand-Eel or Sand-Launce.

Baker reports this species from Somersetshire. In examining a very fine example received from Mr. Dunn, I find the œsophagus enters abruptly into a pyriform stomach, which has a very narrow prolongation from its posterior or larger end, longer than the remainder of the organ ; the pylorus is also very narrow, and where it enters the small intestines that canal is prolonged upwards into a cæcal sac, while the lengtb of the remainder of the tube scarcely exceeds half the length of the stomach.

Ammodytes tobianus, Linn. Lesser Sand-Eel.
Found at Weston.

## Morrhua vulgaris, Flem. Codfish.

Taken during the winter months on lines; as is also Morrbua eglefinus, or the Haddock; M. merlangus, Lim., or the Whiting, numbers of the young of which are captured in the shrimpnets; and Morriua lusca, Linn., or the Bib.

Gadus pollachius, Linn., the Pollack, and Merluccius vulgaris, or the Hake, are also occasionally taken in the Trammel during the winter months.
Phycis blennoldes, Brünn., or the Forked Hake; Molva vulgaris, Flem., or the Ling; Motella mustela, Linn., Fivebearded Rockling; M. tricirrata, Bl., Three-bearded Rockling; Raniceps trifurcatus, Flem., Trifurcated Hake. Have all been captured in Somersetshire.

Rhombus maximus, Linn. The Turbot.
A few are captured off Weston ; one weighed 16 lb . The following memoranda from Lord Ducie's observations on this fish, as taken in Ballinskellig Bay, are very suggestive as to the growth of the Turbot:-

In the year 1877 the average weight (excluding the three largest fish, as was done also in 1878 and 1879) was 2 lb ., a few were an ounce or two above or below that weight. In the two succeeding years, captured at the same place and time, they were as follows:-

|  | 1878. |  | 1879. |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  | Weight. |  | $\underset{1}{\text { No. of fish. }}$ | Weight. |  |
| No. of fish. | lb. | oz. |  | 1 lb . | oz |
| 4 | 1 | 8 |  |  |  |
| ... | ... | ... | 3 | 1 | 4 |
| ${ }_{2}$ | 1 | 12 | ${ }_{1}^{2}$ | 1 | $\begin{array}{r}8 \\ 12 \\ \hline\end{array}$ |
| 2 | 2 | ... | 7 | 2 |  |
| i | 2 |  | 1 | 2 | 8 |
| 1 | ${ }_{2}^{2}$ | 12 | $\cdots$ | ... | ... |
| 18 | 3 |  | 9 | 3 |  |
| 2 | 3 | 4 | 2 | 3 | 4 |
| 9 | 3 | 8 | 1 | 3 | 8 |
|  | $\cdots$ |  | 3 | 3 | 12 |
| 1 | 4 | 14 | $\because$ | 4 | ... |
| 1 | 4 | 4 | 3 | 4 | 4 |
| ... | ... | ... | 2 | 4 | 8 |
| ... | ... | ... | 1 | 4 | 12 |
| ... | ... | ... | 3 | 5 |  |
| ... | ... | ... | 3 | 5 | 4 |
| ... | ... | ... | 1 | 5 | 8 |
| ... | ... | ... | $\stackrel{2}{2}$ | 5 | 12 |
| $\cdots$ | $\ldots$ | $\ldots$ | 1 | ${ }_{6}^{6}$ | $\stackrel{4}{4}$ |
| ... | $\cdots$ | $\ldots$ | 1 | 6 | 12 |
| 1 | 7 | ... | 2 | 7 | ... |

If we analyze the foregoing figures we find the captures in the three years as follows:-

| Weight:- | 1-2 lb. | $2-3 \mathrm{lb}$. | 3-4 lb. | 4-5 lb. | 5-6 lb. | 6-7 lb. |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1877 | 111 | 4 |  |  |  |  | or 115 fish. |
| 1878 | 8 | 20 | 12 | 2 |  | 1 | or 43 |
| 1879 | 6 | 8 | 18 | 9 | 8 | 4 | or 53 |

The general average of the weight of the captures increased from 2 lb . in 1877 , to 3 lb . in 1878, and 3 lb . 11 oz . in 1879 ; and an examination of the figures leads to the belief that the broods were much more numerous in the first than in the second or third year ; while the small size of those taken in 1877 would also seem to infer the absence of large Turbot in Ballinskellig Bay at that time. In 1878 the figures apparently show that the increase in weight of the fish had been from $\frac{1}{2}$ to $2 \frac{1}{2} \mathrm{lb}$. each fish, the highest numbers being among examples from 2 to 4 lb ., instead of from 1 to 2 lb . But in 1879 we again find a change, the highest numbers captured being among those weighing from 3 to 5 lb . each, which would seem to confirm the conclusions demonstrable from the figures in the preceding years.

Rhombus levis, Linn. The Brill.
Is occasionally taken at Weston.
Rhombus megastoma, Donov. The Whiff, or Mary Sole. Rhombus punctatus, Bloch. "Muller's Topknot."

These fishes are both found in Devonshire ; the latter frequently in the spring months. In Ballinskellig Bay this year Lord Ducie took Whiffs between the middle and end of July, but none in the succeeding month.

Arnoglossus laterna, Walb. The Scald-fish.
Somersetshire (Baker).
Pleuronectes platessa, Linn. The Plaice. P. limanda, Lim. The Dab. Pleuronectes microcephalus, Donovan. The Smear Dab.

## Pleuronectes elongatus, Yarrell. (Plate LXI.)

The talented author of the 'British Fishes' received an example from Stolford in Somersetshire, where Mr. Baker obtained two specimens; and Mr. Higgins (Zoologist, 1861, p. 7317) records two more from Weston, which he gave to Mr. Couch. It is with much pleasure that I have to record my thanks to that excellent observer Mr. Matthias Dunn, of Megavissey, in Cornwall, for a fine example, about 9 inches long, taken in 30 fathoms water by a trawler, almost two miles from the Deadman, Cornwall, November 6th, 1879, and which I received on the 10 th .

$$
\text { B. v., D. } 115, \text { P. 12, V. 6, A. } 97, \text { C. } 19, \text { L. } 1.115 .
$$

Length of head $6 \frac{1}{2}$, of caudal fin $6 \frac{1}{2}$, height of body $3 \frac{1}{4}$ in the total length. Eyes on the right side, and separated from each other by a very narrow scaleless ridge, which is continued almost to the origin of the lateral line ; lower eye one third in advance of the upper. Lower jaw slightly the longer anteriorly, and has a tubercle below the symphysis. Maxilla two thirds as long as the orbit, and extending to beneath the front edge of the lower eye. Body very thin, its greatest thickness equalling one sixth of its greatest height, excluding the vertical fins. Teeth in a single row, compressed, with
their crowns somewhat obtuse; teeth most developed on the blind side. Fins. Dorsal commences over the middle of the upper eye, its longest rays being in its middle, where they are three fifths of the length of the head; posteriorly the fin terminates almost close to the root of the caudal fin, which latter is wedge-shaped. Anal similar to dorsal, but its middle rays not so elongated. Both pectorals with twelve rays, the left half as long as the head, the right one fourth longer than the left. Ventrals each with six rays, and one half as long as the pectoral. Scales cycloid on left, feebly ctenoid on the right side, none over the fin-rays except on the caudal. Lateral line with very slightly oblique descent above the pectoral fin, whence it proceeds direct to centre of the caudal. Gill-rakers short, spinate, and widely separated. Cacal appendages two, moderately developed. Colours : right side brown, with a slaty tinge, darkest about the head; a black blotch on the upper half of the pectoral fin ; vertical fins of a greyish slate-colour, the anterior dorsal rays being tipped with white; left side white.
Habitat. A single example 9 inches long, from Megavissey, Cornwall, obtained and recognized by Mr. Matthias Dunn. Yarreli's example, a dried skin, had probably shrunk, causing it to appear more elongated than is natural. It is more closely allied to $\boldsymbol{P}$. cynoglossus.

## Pleuronectes flesus, Linn. The Flounder.

Reversed examples were exceedingly numerous, and in one instance I saw a Flounder coloured on both sides. I would here draw especial attention to four abnormally coloured Plaice and Flounders in the Westminster Aquarium, all of which are white on the underside; the eyes are normal; while the albinism I am about to describe has existed from the time they were received, neither increasing nor diminishing. In one (1) the dorsal and anal fins are white to a great extent, but in rather an irregular manner ; (2) the dorsal and anal fins are similar to no. 1, but the white has extended onto the sides of the body; (3) the white is rather more spread than in no. 2 ; (4) the caudal fin and most of the posterior half of the body are nearly white, whereas the anterior portion of the body is mottled. If, as suggested by A. Agassiz, the colours of these fish are affected owing to the eye, on what will eventually be the uncoloured side, passing over to the upper surface, leaving the eyeless side colourless, due to the controlling power of the nerve laving become unable to act over the colour-cells, how, one would suggest, can this albiuism be present in examples wherein both eyes are present on the dark side thus affected?

Solea vulgaris, Quensel. The Sole.
Small ones were common in the shrimp-nets at Weston; and Mr. Mable writes me word from Weston (Sept. 13) that, "during the last few days, a large quantity of very fine Soles have been taken here. On inquiry I find they were caught about 30 miles down the Chanuel by two trawls from Cardiff; the gross weight was 10 tons, and the heaviest
pair 8 lbs . This is a new fishing-ground, having only been tried about 6 months. Numbers of other fish have been taken, and recently a Sturgeon. The waters close here cannot be trawled, because codlines have been in use for about the last hundred years, and every time one is sunk a large stone or two is let down with it ; consequently the sea-bottom is studded with this kind of thing."

Solea variegata, Donov., Variegated Sole; Solea vulgaris, Giinther, the Lemon Sole ; Solea minuta, Parnell, the Little Sole. IIave all been recorded from Somersetshire.

Maurolicus borealis, Nilss. The Argentine.
Seven examples taken at Weston by Higgins.
Salmo salar, Linu. The Salmon.
Occasionally an example gets into one of the stationary shrimpnets in passing from the sea to the rivers or vice versa. It may be observed in this place that the authorities of the Brighton Aquarium have now conclusively demonstrated, what has long been known to every ichthyologist, that the Parr is the young Salmon. Mr. Francis Francis observes in the 'Field' (August 2, 1879) that Mr. Berrington sent from the Usk "a beautiful consignment of small Parr, to the number of about twenty, about six or eight months ago, more than three fourths of which are still alive. They were placed in fresh water, and soon began to feed and take to their tank. From that time not one has died; towards May, most of them began to assume the Smolt stage. I think there were only four which failed to do so, all the rest became veritable Smolts; the four remained definite Parr. Then arose the question what were we do ; should we take out the Parr and leave the Smolts; and then introduce salt water gradually? * * We therefore thought we would sacrifice the four Parr, if it were necessary, as the belief formerly prevailed that to introduce Parr into salt water before they assumed the Smolt stage was certain death to them." He continued that salt water was gradually introduced ; the Smolts became rampant with pleasure while the Parr did not die. At last no fresh water remained in the tank; it was entirely marine. "Then the Parrs which had remained Parrs up to that time began to assume the Smolt stage, and now every one are brilliant active Smolt, miniature Salmon in fact, and as different fish from the duller and more inactive Parr as one could conceive."

## Belone vulgaris, Flemm. The Gar-fish or Gar-pike. <br> Is occasionally taken off Weston.

Scomberesox saurus, Walb.
The Skipper has been taken in Somersetshire. Mr. Dumn sent me a good example, 11 inches long, in September this year, which he observes "sprang into a fisherman's boat at midnight. I have known nearly a dozen similar instances."

Exocetus evolans, Linn. The Flying Fish.
Somersetshire.
Engraulis encrasicholus, Linn. The Anchovy.
Occasionally taken in the shrimp-nets. Those at the mouth of the Parret are said to be very superior.

Clupea harengus, Linn. The Herring; Whitebait (in part).
I obtained several small examples of this fish from the stationary shrimp-nets; but "Whitebait" is not taken to such an extent as to be an article of consequence as food. I will here refer to some investigations which I made during the last two seasons, respecting what Whitebait is. In May 1878 I commenced collecting examples, excluding other fishes as Gobies and Sticklebacks, a very few of which accidentally or fraudulently are found mixed with the true forms, restricting my observations to what are the species known by this name in London, to the trade, and to epicures. My collections were continued until the end of October, all the examples coming from the Thames. Mr. Charles, the Belgravian fishmonger, kindly procured me examples from the Medway during January and March this year, and subsequently I have reverted to Billingsgate for my supply. I examined 138 of these fish taken during May and June 1878, the longest of which was 2.5 inches: about 1 in 10 were Sprats, the remainder the young of the Herring. In August, out of 46 examples, from 2 to 3.5 inches in length, 24 (from 2 to 2.7 inches long) were Sprats, and 21 (from 2.8 to 3.5 inches long) were young Herrings. In October, out of 41, from 2.5 to 3.5 inches long, all were Herrings. It thus appears that both Sprats and young Herrings find their way into the London market as Whitebait. Out of 31 examples of winter Whitebait received from Mr. Charles, 26 varied from 2 to 4.5 inches in length, the larger ones having well developed roe, all were Sprats; the remaining 5 were young Herrings from 5 to $7 \cdot 5$ inches long, the largest possessing slightly developed roe.

That Pennant's drawing was the Whitebait of the present time there can be but little doubt, as well as that his examples were young Herrings. It is also certain that Donovan's figure is that of a young Shad, the immature of which, if sufficiently numerous, would do as well as those of the Herring or of the Sprat; while I certainly possess the young of these last two forms which I have received as Whitebait.

Clupea alosa, Cuv. The Shad or Allis Shad.
Clupea finta, Cuv. The Twaite Shad.
A good local example exists in the Weston Museum. At the commencement of June these fish were common in the Severn near Gloucester, while their ova was ripe. They used to ascend far above Shrewsbury, and many were captured on the fords in the river Severn; but for years none have been seen, probably owing to the weirs on that river and their being unable to ascend the fish-passes; while for the
last few seasons I understand that they have greatly decreased in numbers in the Wye. As the floods at the earlier part of this year entirely precluded their capture at the mouth of the latter river, it is to be presumed that there will be an augmented supply in May and June 1880, should the season be favourable for fishing.

Clupea pilchardus, Walb. The Pilchard. (Plate LXII. fig. 1.)

A few stragglers are said occasionally to be taken off Weston. Observing a great diversity in the various descriptions of this fish, I applied to Mr. Dunn of Megavissey, who kindly forwarded me about a dozen, one half of which were spotted along the sides, the remainder being spotless. The following are the various formularies given for this fish :-

Donovan. D. 18, P. 16, V.8, A. 17, C.32. (L. 1. shown as distinct in figure, with about 31 scales.)
Yarrell. B. viii. D. 18, P.16, V. 8, A. 18, C. 19. Seales "very large."
Cuv. \& Val. D. 17, P. 17, V. 6, A. 21, C. 18, L. l. 29. Cæc. pyl. innumerable.
Couch. D. 18, P. 16, V. 8, C. 22, L. l. (about 37 in figure).
Günther. B. vi. D. 17-18, V. 6, A. 18-19, L. 1. 47-48. Cæ. pyl. 7.

Thus the number of scales along the body in this fish vary according to different authors from 29 to 48 ; the ventral fin rays from 6 to 8, and the cæcal appendages between "seven" and "innumerable." Taking some fine examples of Pilchards sent to me by Mr. Matthias Dunn, I found them as follows:-

$$
\text { D. 18, P. 19, V. 8, A. 17-18, C. 19, L.1. 29-30, L.tr. } 9 .
$$

Cæc. pyl. numerous. From 17 to 19 scutes before the base of the ventral fin, and 14 posterior to it. The proportions being shown in the figure (Plate LXII.), it is unnecessary to advert to them. The cecal appendages were very numerous, and much shorter in some examples than in others. The sole British Clupea that I have met with having only 7 appendages is $C$. sprattus, which, however, has $47-48$ scales along the lateral line. Therefore I cannot think that Clupea sugax, Jenyns, from the Pacific coast of America, Japan, and New Zealand, is "so closely allied to the European Pilchard that it might be more properly described as a climatal variety" (Günther, Catal. vii. p. 444); for though the number of dorsal and anal fin-rays is the same, instead of having L. 1. 29-30, L. tr. 9, it has L. 1. 50-54, L. tr. 13-a conclusive proof that the two ought not to be classed as varieties of one species. However, I think I am now in a position to explain this remarkable discrepancy in the number of scales as given by various authors. I received a scaleless (but otherwise beautiful) example of Pilchard, 8.3 inches in length, from Mr. Dunu,
Proc. Zool. Soc.-1879, No. XLIX.
which apparently had L. 1. 53 ; and I have since examined at the British Museum similar specimens giving the appearance of having had from 48 to 51 scales along the body. I therefore scaled a specimen having L. l. 29 : and to my surprise I found marks of the adhesion of what appeared to have been 53 scales. In fact, when the fishes have been denuded of their covering, they give the remarkable phenomenon of appearing to have had about twice the number of scales which they really possessed.

Some of these Pilchards had spots along the sides, others had none, the marks being largest in those destitute of scales. Mr. Dunn observed that "often one in five among thousands are thus spotted. The great difference I have found in the varieties is that the scales are less firm in the spotted fish than in the plain ones *** I think there can be no doubt that strong and healthy Pilchards spawn twice in the year, in December and June; their roe floats on the surface of the sea. I have seen the roe passing from these fishes when alive, and have allowed it to drop in a bucket of water, and observed each globule separate and start along the water, and finally hang just beneath the surface. Pilchards seldom spawn nearer than 10 miles from land, usually from 20 to 30 miles off; they are more plentiful in the English Channel than most people are aware of. My brother was on board of a fishing boat in 1877, midway between Mamsgate and France, fishing for Mackerel. About the 20th Sept. the sea appeared full of fish; on the nets being employed, they turned out to be Pilchards of a very fine size. Besides the spotted variety, there is one with a white ring in its eye, another black-eyed; but this may be due to age."

Clupea sprattus, Linn. The Sprat. (Plate LXII. fig. 2.)
This fish comes into Weston in large numbers about October, when it is followed by many predaceous forms. I rarely, however, visited the fishing-stakes in July or August without finding a few examples. Baker observes that these fish "suspended in lines in cottage-kitchens are seen for months after the fishing-season is over."

## Angulla vulgaris, Turton. Common Eel.

Both A. acutirostris, Risso, and A. latirostris, Risso, have been recorded from Somersetshire. These and several other fishes are said to have largely decreased in numbers of late years-attributed by some to the increased impurity of the water, by others to the destruction of the Elvers or young Eels. I obtained several Eels from the stationary fishing-nets: they were termed "Silver Eels," owing to their colour and in contradistinction to the "Golden Eels," or those from the muddy waters of the Severn or Avon. Without discussing the question of how to distinguish the various British Eels, I must here refer to Hastings (Illust. Nat. Hist. of Worcestershire, 1834, p. 135), who observes "there are two distinct kinds of Eel in the Avon, the silver and the yellow Ed; there is likewise another
description, but which I have never seen, called frog-mouthed Eel by the fishermen, from the extraordinary width of its month." In August I received two Eels, each 3 feet long, from the Severn, taken on the same day : the head of one is most curiously flattened, probably due to some injury received in its early derelopment; but the fishermen asserted that this example is one of the third variety, probably identical with that termed frog-mouthed Eel by Hastings. Its snout is very broad, lips comparatively thin, and the angle of the mouth below the hind margin of the eye.

Conger vulgaris, Cuvier. The Conger Eel.
Small ones are common at Weston; and many are captured by lads from under stones, where they have sought shelter as the tide ebbed.

Siphonostoma typhle, Linn. The Broad-nosed Pipefish.
Syngnathus acus. The Great Pipefish.
Nerophis equoreus. The Ocean Pipefish.
These fishes have all been recorded from Somersetshire.
Tetrodon lagocephalus, Linn., or T. pennantif, Yarrell.
Rather a fine stuffed example, 15 inches long, exists in the Weston Museum. It was purchased from a local bird- and animalpreserver, so is probably a local specimen; but no history is obtainable. If we turn to the records of where this fish has been taken in Great Britain, we find that the British Museum possesses an example from Charmouth in Dorsetshire ; one is recorded from Waterford in Mag. Nat. Hist. 1837, a second in the 'Zoologist' for 1853, and a third Irish example at Wexford in 1850; two are recorded from the Orkneys in the 'Zoologist' for 1853 , while many have been taken in Cornwall. Consequently the capture of one in Somersetshire would be no peculiar circumstance.
Orthagoriscus truncatus, Linu. Oblong Diodon.
Has been captured in Somersetshire.
Orthagoriscus mola, Bl. Schneider. The Sunfish.
This is said to have been seen off Somersetshire. During the last season, Lord Ducie (August 13th) saw one of these fish in Ballinskellig Bay. I give the following summary from some interesting observations which his Lordship made during a previous season.

There is no locality in the United Kingdom where the Shorter Sunfish, Orthagoriscus mola, is more frequently seen than off the south-west coast of Ireland; and Lord Ducie remarks that he has frequently fallen in with them all along the coast from Dungarvan to Valencia. August 1877, a boat's crew from his lordship's yacht returuing from long lining fell in with a large one lying on the surface in its usual lazy fashion, the projecting caudal fin describing the segment of a circle in the air, as the unwieldly body rolled with every
heave of the sea. Having rowed up to the fish, they found his skin too tough to permit them to fix the conger-gaff in him; and their attempts seemed to occasion him neither discomfort nor alarm. Next they succeeded in introducing the gaff into his mouth; he struggled violently for a few minutes, got his head down, and with one wrench escaped, bearing the gaff away with him.

Thinking that a similar opportunity might again occur, a large hook was fastened to a stick, a lanyard being securely affixed to the hook, and "stopped" along the stick; to a hook at the end of the lanyard a strong line could be attached when necessary. No opportunity occurred of testing this implement until July 31st, 1878, when, just as Lord Ducie was about to shoot an Otter-trawl from his fishing-cutter (a boat of 30 tons), a Sunfish was seen close alongside in about 6 fathoms of water. Going up to it in a dinghy rowed by one man, this fish allowed them to approach quite close. It lay on one side, blowing a stream of water out of its mouth, and vacuously rolling its eyes without showing alarm, although only about one yard distant. Now the hook was fixed into its mouth: for three or two seconds it remained motionless, and then with one plunge dived down. Some few fathoms of line from the 50 -fathom reel had fortunately been uncoiled; yet for a few moments it appeared as if the fish would prove the more powerful, and carry away reel and all. One turn of the line was got round the stern of the boat, which the fish now dragged through the water for some 200 yards ; but from time to time striking the sandy bottom of the shallow bay, it came to the surface, plunging down again with gradually failing strength. It was secured after about half an hour's chase, and took six men to haul it above high-water mark. Length 6 feet 3 inches; depth 3 feet 2 inches; distance from fin to fin, taking the extreme points, 7 feet 5 inches. Two more were subsequently captured in a similar way.

## Acipenser sturio, Linn. The Sturgeon.

Baker records both the common form and likewise the broadsnouted variety from Somersetshire. In the Weston Museum exist the remains of one which was taken in the stationary shrimpnets. An example in my collection was kindly sent to me by Mr. Carrington ; it lived in the Aquarium from May 1878 to July 1879. Originally captured off Margate, the fishermen fastened a line round its tail, and towed it thus at the stern of their vessel to the Thames. On arrival the rope was found to have cut almost to the backbone; so great was the injury, that the fish was at first refused. However, it so entirely recovered that scarcely a trace of the scar remains. While in the Aquarium it was fed on lob-worms.

## Galeus canis, Bonap. The Tope.

Weston.
Lamna cornubica. The Porbeagle or Beaumaris Shark.
An example 4 feet 3 inches in length was captured in the mid-
channel off Weston in 1871, while apparently lying asleep on the surface of the water, the fishermen being able to row up to it. A cast was taken by Mr. Mable. The skull was also preserved; the teeth are large, lanceolate, and have a well-developed cusp on either side of their base.

Scyllium canicula, Linn. The Lesser Spotted Dogfish.
Acanthias vulgaris, Risso.
These fishes are neither uncommon, especially during the Sprat season.

Raja clavata, Linn. The Thomback
Raja batis, Linn. The Common Skate.
These are both found at Weston, but usually as immature examples.

Petromyzon marinus, Linn. The Lamprey or Sea Lamprey.
P. fluviatilis. The River-Lamprey or Lampern.

Both are taken at Weston.
P. branchialis, Linn. Small Lamprey.

Has likewise been recorded from Somersetshire by Baker.
gXplanation of the plates.
Peate LXI.
Pleuronectes elongatus, p. 755.
Plate LXII.
Fig. 1. Clupea pilchardus, p. 759.
$1 a$. Stomach and cæcal appendages of ditto.
2. Clupea sprattus, p. 760.
$2 a$. Air-bladder, stomach, and cæcal appendages of ditto.

December 16, 1879.
Prof. Flower, LL.D., F.R.S., President, in the Chair.
The Secretary read the following report on the additions to the Society's Menagerie during the month of November 1879 :-

The total number of registered additions to the Society's Menagerie during the month of November was 63 , of which 4 were by birth, 16 by presentation, 22 by purchase, 13 were received on deposit, and 8 by exchange. The total number of departures during the same period, by death and removals, was 74.

The most noticeable addition during the month of November was as follows:-

A fine example of the King Penguin (Aptenodytes pennanti),
purchased November 14th. This bird was in the uniform brown down plumage of the first year when it arrived, but has now nearly thrown off that dress, and attained the ordinary feathering. It is said to have been captured at Staten Island, Tierra del Fuego.

Mr. T. Jeffery Parker read a paper on the Intestinal Spiral Valve in the genus Raia. Mr. Parker showed that there were four types of valves exhibited in individuals of that genus, differing from one another in morphological characters, in the extent of absorptionsurface presented to the food, and in the resistance offered to the passage of food.

This paper will be printed entire in the Society's 'Transactions.'

Mr. Seebohm exhibited a small collection of birds made by Capt. the Hon. G. C. Napier in the valley of the Atreck river which flows into the Caspian Sea not far north of Asterabad, and forms the boundary line between Russia and Persia. The species were as follows:-

Falco cenchris, Cuv.
Coracias garrulus, Linn.
Pratincola caprata, Limn. [This species has not hitherto been found further west than Baluchistan, though it ranges eastward as far as the islands of the Malay archipelago.-HI. S.]

Emberiza luteola, Lath. [Not hitherto found west of Turkestan.]

Emberiza hortulana, Linn. ( ( ) .
Hypolais caligata, Licht.
Cypselus melba (Limn.). Shot on 12th April, flying in company with the Common Swift, at 3000 feet elevation.

Pterocles alchata (Linn.) Shot near Teheran, 26th September, at 4800 feet elevation.

Glareola pratincola (Linn.). Shot 10th May.
Botaurus stellaris (Linn.).
Edicnemus scolopax (Gmel.). Shot 26th April at 3000 feet elevation.

Plegadis falcinellus (Linn.). Shot 26th May.
Phalaropus hyperboreus, Lim. Shot 25th May. [Doubtless on migration towards its breeding-grounds in the valley of the Petchora, where it arrives during the first or second week of June.-H.S.]

Mr. Sclater exhibited a small collection of birds from the island of Montserrat, West Indies, which had been prepared and kindly sent to him for examination by Mr. J. E. Sturge, of Plymouth, Montserrat.

As nothing was yet known of the ornithology of Montserrat, Mr. Sclater thought it desirable to record the names of the species.

| Local Name, as giren by Mr. Sturge. | Sciontific Manc. |
| :---: | :---: |
| 1. "Thrush" | rgarops densirostris. |
| 2. "Yellow-breasted Sparro | Certhiola dominicana. |
| 3. "Sparrow" | Phonipara bicolor. |
| 4. "Kingfisher" | Ceryle alcyon. |
| 5. "Quaker-bird" | Coceyzus minor. |
| 6. "Killie-Hawk" | Tinnunculus sparverius. |
| 7. "Crab Gaulin" | Ardea herodias. |
| 8. "White Gaulin" | rdea candidissin |
| 9. "Waterwitch" | torides viresce |
| 10. "Blue Pigeon" or | olumba corensis. |
| 11. "Mountain-Dove" | enaida martinicana. |
| 12. "Partridge Dove | Geotrygon mystacea. |
| 13. "Coot" | Gallinula galeata. |
| 14. "Diver" | Podilymbus podiceps. |

Mr. Sclater observed that all these birds also occurred in the neighbouring islands of Barbuda, Antigua, and Guadeloupe, or one of them, as recorded by Mr. Lawrence in his articles on Mr. Ober's collections from these localities lately published in the 'Proceedings of the United-States National Museum.' At the same time it was highly desirable that further collections should be made in Montserrat, where it was quite possible that peculiar species would still be found amongst the Passeres.
[P.S. Jan. 30th, 1880.-Mr. Sturge has since sent me examples of three other species of birds from Montserrat-namely, Loxiyilla noctis, Elainea martinica, and Puffinus obscurus, -and has kindly promised to continue his collections.-P. L. S.]

Mr. R. G. Wardlaw Ramsay exhibited a specimen of Pericrocotus flammeus in an abnormal state of plumage, and made the following remarks:-
"I have the pleasure of exhibiting a rather interesting specimen of Pericrocotus flammeus, which I obtained some years ago on the Neilgherry Mountains, in Southern India.
" Briefly speaking, the normal plumage of the adults of this species is red and black in the male, and yellow and grey in the female. The plumage of the young male is much like that of the adult female ; and specimens are to be found in museums exhibiting every stage of the transition from the grey-and-yellow to the black-and-red dress. The peculiarity in this particular specimen, which is a male, is that it has entirely assumed the black plumage of the adult male without any attempt having been made to change the yellow iuto red; so that we have here a specimen, to all appearances adult, which is partly clothed in the dress of the male and partly in that of the female.

The following papers were read:-

1. On the Cæcum of the Red Wolf (Canis jubatus, Desm.). By W. H. Flower, LL.D., F.R.S., P.Z.S.
[Receired Norember 11, 1879.]
A simple cylindrical cæcum, closely folded several times upon itself, was formerly supposed to be a characteristic of the Canidæ, as all the species which had been dissected up to 1873 agreed generally in the form of this organ. The numerous opportunities of dissecting members of the group which have occurred at the Society's Gardens, have, however, afforded our late Prosector the means of demonstrating that the generalization had been made upon too narrow a basis.


Cæcum of the Red Wolf (Canis jubatus); half the size of nature. Cm. Cæcum, C. Colon, i. Ilium.

The first exception discovered was the South-American Canis cancrivorus (P.Z.S. 1873, p. 748), which has a comparatively short cæcum with only a slight curve; and in communicating the observation, Mr. Garrod remarked that it would be interesting to know whether the other South-American Canidæ agree with C. cancrivorus in the simplicity and shortness of their cæca.

In a subsequent communication (P. Z. S. 1878, p. 373) Mr. Garrod reverted to the subject, and showed that, of the various species he had dissected, Nyctereutes procyonides (from North-east Asia) alone agreed with Canis cancrivorus in having a nearly straight cæecum, while C. laniger, C. lagopus, C. anthus, C. fulvus, C. antarcticus, C. azarce, Otocyon lalandi, and Lycaon pictus conform with the type of Canis familiaris, and C. aureus and C. famelicus have the organ

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somewhat shortened, wanting the terminal twist. From the examination of other specimens preserved by Mr. Garrod, and now in the Museum of the College of Surgeons, I may add that Canis rutilans, C. primavus, C. cerdo, C. chama, and C. magellanicus have all folded сæса; but differences can be observed in the length and mode of folding, both in them and in the species stated by Mr. Garrod to resemble C. faniliaris, though without a larger series it is impossible to say whether some of these differences may not be due to individual peculiarity.

It is, however, clear that the form of the cæcum has nothing to do with a geographical division of Canidæ; nor is it, as far as is yet known, correlated with any other structural modification.

The female example of the very handsome and rare Red Wolf or Fox (Canis jubatus) from Buenos Ayres, which died lately, after a residence of two years in the Gardens, has enabled me to give a figure of the smallest (relatively to the size of the animal) and simplest form of cæcum yet observed in the group. It lies by the side of the ileum, without the slightest inclination to a curve in either direction. Its length is slightly less than three inches, and its greatest diameter one inch. From a contracted base it expands gradually to the middle, and continues of a cylindrical form to the termination in a conical apex.

There was no striking deviation from the ordinary canine type in any of the remaining viscera of this animal which were forwarded for my examination. The lobes and fissures of the liver agreed in all essentials with those of the common Dog. In the tongue the lytta (the absence of which in Lycaon pictus is noted by Garrod) was well developed ${ }^{3}$.
2. Second List of Mammals and Birds collected by Mr. Thomas Waters in Madagascar. By Edfard Bartlett, Curator of the Museum and Public Library, Maidstone.
[Received November 15, 1879.]

## (Plate LXIII.)

Since my first paper ${ }^{2}$ on the Mammals and Birds of Madagascar, I have received several small collections from Mr. T. Waters (who still continues his labours, and is now in South-east Betsileo country); and it affords me much pleasure to bring before the Society a list of those species which are not included in my former list.

Among the species I find one new and interesting Mammal belonging to the genus Nesomys, and two new species of birds of the following genera, viz. Cypselus and Zapornia, a description of which will be found under the genera which they represent.

[^70]Up to the present I may mention that I have noticed 41 species of Mammals and 81 species of Birds, from Mr. Waters's collection in this district.

## Mammals.

1. Lemur catta, Linn.

Ekongo, S.W. coast of Madagascar.
Several specimens of males, females, and young.
They do not appear to vary much, except in the colour of the back, which is in some examples grey, and in others of a beautiful pinkish brown.
2. Lemur rufifrons, Geoffr.

Ekongo, S.W. coast of Madagascar.
One example.
3. Lemur mongoz, Linn.
S.W. coast of Madagascar.

Examples of this species rary much in the colour of the tail, some having the tail bright reddish brown with whitish tips, while others have it of a pale yellowish brown.
4. Lemur nigrifrons, Geoffr.
S.W. coast of Madagascar.
5. Lemur xanthomystax, Gray.
S.W. coast of Madagascar.
6. Hapalemur simus, Schl. \& Pollen.

Ekongo and S.E. Betsileo, Madagascar.
Several examples of males and females. They vary very little in colour; and all those I have examined have the yellowish brown patch on the rump.
"They live in the bamboo forests, and feed on the young shoots of the bamboo."-T. Waters.
7. Hapalemur olivaceus, Geoffr.
S.W. coast of Madagascar.

Called by the natives "Coaline."
8. Chirogaleus milii, Geoffr.

Ekongo, Madagascar.
9. Lepilemur mustelinus, Geoffr.
S.E. Betsileo, Madagascar.

Four specimens are in the present collection, which vary very much in colour:-
(1) Adult male : iron-grey, with yellowish brown tinge ; tail uniform greyish brown.
(2) Adult female : crown pale grey ; shoulders, back, and fore-
arms dark reddish brown ; rump and hind legs pale greyish brown; tail blackish for half its length.
(3) Adult female: very bright rufous brown on all the upper parts, large dirty brown patch at base of tail or rump ; tail brown for half its length, paler at the base.
(4) Young male, half-grown: colour the same as No. 2; the only important difference is a blackish patch behind the ear.

All the above specimens have a very characteristic yellowish white stripe, which runs from the cheek down the side of the neck, and nearly unites at the lower part of the back of the neck.
10. Microrhynchus laniger, Illiger.
S.W. coast of Madagascar.

Female and young, called by the natives "Ovandroo."
11. Propithecus verreauxit, Grand.
S.E. Betsileo, Madagascar.

A young male: crown brownish black, which does not extend to the nape.
12. Propithecus holomelas, Günth. Ekongo, S.W. coast of Madagascar.
13. Propithecus edwardsi, Grand.

Ekongo, S.W. coast of Madagascar.
In a former collection (from the above locality) I received a male, female, and young of this species. The young one appeared about three or four days old: the fur is long and rough; and the yellowish brown band across the loins (as in the adult) is very distinct.
14. Cynonycteris straminea, Geoff, var. C. dupreana, Poll S.E. coast of Madagascar.
15. Miniopterus schreibersi, Natt.
S.E. Betsileo, Madagascar.
16. Miniopterus scotinus, Sund.

Ekongo, Madagascar.
Called by the natives "Hepate."
17. Vespertilio goudoti, Smith, var.
$T$. madagascariensis, Tomes.
S.W. coast of Madagascar.
18. Phyllorhina commersoni, Geoffr.
S.E. Betsileo, Madagascar.

Mr. G. E. Dobson has kindly determined the above-mentioned species of Bats for me.
19. Fossa daubentoni, Schreb.
S.W. coast of Madagascar.

Called by the natives "Tambosading."
20. Galidictis striata, Geoffr.
S.W. coast of Madagascar.

This species is described as having seven or nine longitudinal black streaks on the back; the specimens which I have received have only six streaks.
21. Eupleres goudotit, Doyère.
S.E. coast of Madagascar.
22. Nesomys betsileoensis, sp. nov.
S.E. Betsileo, Madagascar.

Called by the natives "Volane andrivo."
Fur soft, abundant, and shining, reddish brown, tipped with black, base nearly black; underparts of body rufous, paler on the chin and throat; feet and tail sparingly covered with short pale-coloured hairs.

Length 7 inches; tail 3 inches.
This interesting Rodent closely resembles in general appearance our common Water-Vole (Arvicola amphibius), differing in being much smaller, in its richer tone of colour, the fur nearly black at the base, and the tail shorter.

## Birds.

1. Scops rutilus, Puch.
S.W. coast, and S.E. Betsileo, Madagascar.

Called by the natives "Forey-Foreeg."
Egg creamy white.
2. Cypselus balstoni, sp. nov.
S.W. interior Betsileo country, Madagascar.

Called by the natives "Fearilsandro."
Beak black; back, primaries, scapulars, tail, and belly very dark bronze-green, inclining to black, each feather more or less tipped with pale buff, these white tips being more distinct on the belly; top of head, throat, tertials, and secondaries pale dirty buff, palest on throat, tinged with pale bronze-green; under the chin a series of small elongated shaft-spots; under wing-coverts pale greyish buff, with very distinct elongated shaft-spots, tips nearly white; underside of primaries and tail nearly black; under tail-coverts brownish, quills black; legs, toes, and claws blackish brown.

Length 6 inches; wing $6 \frac{1}{4}$ inches, wing beyond tail $1 \frac{3}{8}$ inch.
Having carefully compared this Swift with a number of skins of Cypselus apus, I feel convinced that it is distinct from that species, and I have no hesitation in describing it under the above name. It differs in size and colour, by having the small elongated spots on the throat and on the under wing-coverts. I have much pleasure in naming this species after Mr. R. J. Balston.

## 3. Atelornis pittoides, Lafr.

S.E. Betsileo, Madagascar.

Eggs creamy white, with a smooth surface, but not so highly polished as the egg of Coracias garrulus.
4. Corythornis vintsioides, Eyd. et Gerv.
S.W. coast of Madagascar.

Egg pure white and polished.
5. Upupa marginata, Peters.

Upupa madagascariensis, Bp.
S.W. coast of Madagascar.

Eggs pale greyish blue, resembling those of Upupa epops, but rather larger.
6. Cossypha sharpil,
S.E. Betsileo, Madagascar.
7. Leptopterus viridis, Müll.
S.E. Madagascar.
8. Philepitta castanea, Müll.
S.E. Betsileo, Madagascar.
9. Nelicurvius nelicouvi, Scop.

Hyphantornis pensilis, Gm.
S.E. Betsileo, Madagascar.

Eggs pale blue, about the same size as the egg of Accentor moduluris.
10. Sericosomus serrianus, Puch.
S.E. interior of Madagascar.

Called by the natives "Fandaklanan."
11. Sericosomus, sp. inc.

Ekongo, S.E. Madagascar.
Called by the natives "Fandaklanan."
d. Upper mandible brownish black, tip reddish; base of lower mandible yellowish, tip red ; crown of head, neck, centre of back, scapulars, upper wing-coverts, tertials, upper tail-coverts, and two centre tail-feathers light metallic bronze-green with a rich rufous tinge, each feather broadly tipped with darker rufous brown; rump, chin, neck, breast, belly, flanks, and vent slaty grey, slightly tinged with metallic-green and narrowly tipped with rufous, the rufous being most conspicuous on the breast ; primaries and the remaining eight tail-feathers rich metallic-green with a slight rufous tinge, and tipped with the same colour ; legs black. Length $15 \frac{1}{2}$ inches, wing 5 , tarsus $1 \frac{3}{4}$.

This is a young bird, probably of Coua reynaudi.
12. Cuculus rochir, Hartl.
S.W. coast, and S.E. Betsileo, Madagascar.

Called by the natives "Kang-kappena."
13. Funingus madagascariensis, L.
S.E. Madagascar.

Called by the natives "Firniga-muigu."
14. Ena capensis, L.
S.E. coast of Madagascar.
15. Mesites variegatus, Geoffr.
S.E. coast of Madagascar.

See remarks on the affinities of this genus, Proc. Zool. Soc. 1877, p. 291.
16. Anastomus lamelligerus, Temm.
S.W. coast of Madagascar.
17. Gallinago bernieri, Puch.
S.E. Betsileo, Madagascar.

Male, female, and eggs are in the collection.
Egg pale brown, spotted and blotched with various tints of dark brown, principally at the large end, about the same size as the pgg of Gallinago major.
18. Biensis madagascariensis, Verr.
S.E. Betsileo, Madagascar.

Male and female of this interesting Rail are in the collection.
This bird appears to me to belong to the genus Rallus; it resembles closely $\boldsymbol{R}$. aquaticus and its allies.
19. Zapornia pygmea, Naum.

Zapornia baillonii, V.
S.E. Betsileo, Madagascar.

Specimens of this species, with the eggs, are in the collection.
20. Zapornia watersi, sp. nov. (Plate LXIII.)
S.E. Betsileo, Madagascar.
o'. Beak dark brown; top of head, neck, throat, and breast chestuut-brown, darker on top of the head, paler on the chin; centre of back, scapulars, and upper wing-coverts dark brown, each feather having an elongated black centre; primaries and secondaries dusky brown; upper tail-coverts, tail, and under tail-coverts dark chestnut-brown, tipped with black; belly, thighs, and vent dark slaty brown; legs, toes, and claws pale brown.

Length $5 \frac{1}{4}$ inches, wing $2 \frac{3}{4}$.
우. Beak dark brown; crown of head and neck dark brown, tinged with rufous, with very pale indistinct bars near the tips of each feather ; back, scapulars, tertials, and upper wing-coverts dark brown, the centre of each feather blackish, with from four to six whitish spots and bars on the outer edges of the webs of each feather; primaries dusky black, with two or three very indistinct whitish spots on the outer web of the first and second quill-feathers; upper tailcoverts, tail, and lower tail-coverts chestnut-brown, barred with black
and white ; throat, cheeks, breast, and belly dirty white, tipped with very pale brown ; sides, flanks, and vent greyish brown, barred and spotted with white; legs, toes, and claws pale brown.

Length $5 \frac{1}{4}$ inches, wing $2 \frac{3}{4}$.
This interesting little Rail I submitted to Mr. R. B. Sharpe, who kindly pronounced it to be a new species; therefore I have much pleasure in naming it after the collector, Mr. T. Waters.
21. Podiceps pelzelni, Hartl.
S.W. interior of Madagascar.
22. Fulmarus giganteus, Gm.
S.W. coast of Madagascar.
23. Plotus levaillantid, Licht.
S.E. Madagascar.
3. Descriptions of new Species of Phytophagous Coleoptera. By Martin Jacoby.
[Received November 24, 1879.]
Genus Lema.

1. Lema championi, sp. nov.

Elongate, subparallel, fulvous. Head and breast black; antennæ piceous, their base and apex fulvous; elytra punctate-striate, dark violaceous blue, shining, a slightly curved median transverse band and the apex fulvous.

Length $3 \frac{2}{3}$ lines.
Hab. Zapote, Guatemala.
Head not constricted behind the eyes, impunctate; lateral grooves very deep; eyes deeply emarginate, large, the space surrounding them distinctly punctured; epistome impunctate, shining black; antennæ rather robust, of half the length of the body, the second joint very short, third joint double the length, the basal as well as the fourth to the seventh joints piceous, or black, the rest light fulvous; thorax slightly longer than broad, moderately constricted in the middle at each side, base scarcely perceptibly impressed, surface impunctate, fulvous. Scutellum black. Elytra much broader than the thorax, rather convex and parallel, narrowly transversely depressed below the base, deeply punctate-striate at their anterior half, the punctuation gradually diminishing, and almost obsolete towards the apex, where the interstices are slightly convex, the latter also minutely punctate, of a dark violaceous blue, the middle is occupied by a slightly convex fulvous band extending to the lateral margins, while the entire apex is of the same colour. Abdomen and legs also fulvous.

Collected by Mr. Champion.

This species may be distinguished from L. bicincta, Lac., and others similarly marked, by the colour of the antennæ and the distinct basal depression of the elytra.

## 2. Lema nicaraguensis, sp. nov.

Elongate, parallel. Head and thorax ferruginous; antennæ (base excepted), breast, tibiæ, and tarsi black ; elytra bluish black, the lateral margins, a transverse median band, and the apex flavous; femora and abdomen testaceous.

Length 3 lines.
Hab. Chontales, Nicaragua.
Head not constricted behind the eyes, with a transverse and a median groove at the vertex, entirely impunctate, shining ferruginous, epistome black; palpi and the two basal joints of the antennæ ferruginous, the other joints piceous, the apex of each joint fulvous. Thorax subquadrate, the sides moderately constricted behind the middle; surface distinctly transversely grooved near the base, with two rows of small punctures placed longitudinally on the disk, rest of the surface smooth, shining ferruginous. Elytra deeply punctatestriate anteriorly, the punctuation gradually diminishing, but remaining distinct to the apex, the interspaces near the latter slightly costate; a rather obsolete transverse depression is placed below the base; the colour is a dark bluish black, the lateral margins, a transverse median band not quite touching the suture, and the aper flavous. Abdomen and the femora testaceous; breast, tibiæ, and tarsi black.

This species bears a close resemblance to several others described by Lacordaire and Clark, from all of which, however, it differs in the coloration of one or other parts. It is most nearly allied to L. placida, Lac., and L. violaceo-fasciata, Clark. The colour of the femora and of the apex of the elytra distinguishes it from the first species, while it differs from the last by the red head and the colour of the antennæ ; it may, however, turn out to be a variety of one or the other.

## 3. Lema antennalis, sp. nov.

Elongate, parallel ; chestnut-coloured, variegated with piceous. Antennæ short, the joints transverse, black ; elytra piceous, margined with brown, punctate-striate, intervals finely rugose.

Length 3 lines.
Hab. Zapote, Guatemala.
Head impunctate, lower part of face sparingly fulvous-pubescent; eyes deeply emarginate : antennæ short and robust, only reaching to the base of the elytra; three basal joints brown, shining; the rest black, closely pubescent; first joint swollen, round; second of the same shape, shorter; third half as long again as the second; the following joints gradually widened, transverse, broader than long. Thorax without transverse basal depression, subquadrate, brown, shining, obsoletely streaked with piceous, surface minutely punctured. Elytra deeply punctate-striate anteriorly, the punctuation diminishing
in depth towards the apex, interspaces also minutely punctate, and from below the base to the apex closely and finely transversely wrinkled; there is also an indistinct transverse depression below the base ; the ground-colour is a dark chestnut-brown; the disk, however, is almost entirely occupied by a broad piceous band, commencing below the base and extending to the apex, leaving only the sutural and lateral margins brown. Underside and legs of the same colour, abdominal segments margined with piceous, claws entirely of that colour. The hinder femora very short.

This interesting Lema, of which I have at present only one specimen before me, will be easily recognized by the curiously shaped antennæ and the sculpture of the elytra, although it is doubtless subject to variation in colouring.

## Genus Urodera, Lac.

4. Urodera godmani, sp. nov.

Oblong-ovate, black, shining, beneath closely pubescent. Head and thorax finely punctured. Elytra finely punctate-striate, black, a transverse band at the base, not touching the suture and the apex, rufous.

Length 3-4 lines.
Hab. Dueñas, Capetillo (Guatemala).
Head with an obsolete transverse semicrescent groove between the eyes, distinctly but finely punctured. Antennæ short, black, the second and third joints rufous, dentate from the commencement of the fourth joint. Thorax transversely convex, about twice as broad as long, its sides moderately rounded and greatly deflexed anteriorly, the lateral margins flattened and divided from the convex part by an oblique depression; the flattened portion distinctly punctured and subrugose, rest of the surface very finely punctate, posterior margin oblique at each side, its middle lobe straight. Scutellum with a few extremely minute punctures. Elytra not wider at the base than the thorax; each elytron with nine rows of punctures and a short double row near the suture black; a transverse band, sinuate below the humeral callus and interrupted at a little distance from the suture, and an oblong apical spot rufous; the latter spot does not quite touch the lateral margin or the suture. Underside closely covered with greyish pubescence; anterior legs longitudinally sulcate at their inside; prosternum very narrow.

The punctured head and thorax will distinguish this speecis from others similarly marked, while the design of the elytra separates it from $U$. chevrolatii, to which it bears some resemblance; the thorax is also much more transverse than in the latter species. None of the specimens before me differ except in size from each other.

## Genus Chlamys, Knoch.

5. Chlamys sex-tuberculata, sp. novi.

Quadrate-ovate. Head, body below, and legs fulrous, spotted with violaceous; above violaceous blue, clothed with white pubescence,

Proc. Zool. Soc.-1879, No. L.
thorax finely. Elytra strongly punctured, each elytron with three small tubercles placed triangularly.

Length $1 \frac{3}{4}$ line.
Hab. Capetillo, Dueñas, Guatemala.
Head flat, distinctly punctured, fulvous, eyes deeply emarginate. Antennæ as long as the thorax ; the joints from the fifth to the apex transverse, broader than long; the four basal joints fulrous, the rest black. Thorax regularly narrowed from base to apex, its sides straight, surface regularly conrex, finely punctate and pubescent, riolaceous blue. Scutellum large, darker blue, opaque. Elytra narrowed posteriorly, their apex broadly rounded, closely covered with deep oblong punctures, their sutural margins denticulate through their entire length, each elytron with a short transverse tubercle placed in the middle near the sutural margin, while another small round tubercle is situated above and one below it, the three forming together a triangle. Pygidium fulvous, with a central blue patch. Underside violaceous blue, broadly bordered with fulvous. Legs fulvous, the middle and posterior tibix, as well as the posterior femora, with a blue spot.

This species ought to follow $C$. cinerea, Lac., to which it bears a close resemblance; it may, however, be distinguished by the coarser punctuation of the elytra and the three tubercles on the latter.

## Genus Lamprosoma, Kirby.

## 6. Lamprosoma nicaraguense, sp. nov.

Broadly ovate, very convex. Above dark riolaceous; body beneath, the head, sides of the thorax, and a short lateral stripe near the apex of the elytra cupreo-aureous.

Length $3 \frac{1}{4}$ lines.
IIab. Chontales, Nicaragua.
Head finely granulose, distinctly but not closely punctured; middle impressed with a small round fovea; anterior margin of clypeus concave; labrum and apex of mandibulæ black; first joint of the antemna cupreous, second joint fulvous, the rest more or less metallic greenish black. Thorax twice as broad as long, sides rounded, moderately converging from base to apex; posterior margin rather deeply sinuate on either side, and obsoletely depressed on each side of the middle lobe; surface transrersely convex, impunctate at the sides, distinctly but not closely punctured on the disk, more deeply towards the base, violaceous blue with a distinct tint of greenish olive, and a broad band of bright reddish copper-colour parallel with the lateral margins. Elytra very convex at the base, thence to the apex greatly deflexed, slightly longer than broad, each elytron covered with ten rows of very deep punctures, the interstices smooth and impunctate, of the same colour as the thorax, with a short lateral band of bright aureous near the apex. Entire underside and legs metallic aureous.

From L. pretiosum, Lac., distinguished by the punctures of the thorax and the colour of the antennæ and the elytra. From L. dives,

Lac., equally different by its coloration and the deep punctures of the elytra; while L. hypochryseum, Baly, is devoid of the metallic elytral band.

## Genus Chalcoplacis, Cherr.

## 7. Chalcoplacis instabilis, sp. nov.

Subrotundate-ovate. Above cupreous or dark blue, shining, head cupreous or violaceous blue; antennæ black, their six basal joints fulvous; thorax finely, elytra more deeply punctate; below and the legs black.

Length 2 lines.
Hab. Zapote, Guatemala.
Head rather deeply punctured, lower part of face more closely punctate than the vertex, clypeus not separated; jaws very prominent; antennæ subfiliform, third and fourth joints of equal length, seventh and the following joints thickened, black, six basal joints fulvous, the first stained with piceous above. Thorax transversely convex, narrowed from base to apex, anterior angles acute; surface minutely punctured. Scutellum broad, impunctate. Elytra slightly wider at the base than the thorax, convex, the extreme apex rather acutely produced, surface much more strongly punctured than the thorax, the puncturing arranged in irregular rows, the sutural margin accompanied at its posterior third by an impressed line. The colour varying from purplish cupreous to dark greenish blue. All the latter-coloured specimens bave the head igneous or cupreous, while the reverse is the case with the cupreous ones, whose head is violaceous. Underside black, legs with a coppery hue.

## Genus Noda, Chapuis.

## 8. Noda tasmanica, sp. nov.

Oblong-ovate. Aneous; antennæ piceous, their base and the legs entirely fulvous; head and thorax coarsely punctate, elytra each with four smooth longitudinal costr, their interstices deeply punctate.

Length 2 lines.
Hab. Tasmania.
Head with a deep longitudinal groore in middle, deeply and closely punctured; labrum fulvous, its base piceons; palpi testaccous, their apex as well as the mandibles piceous; antennæ about half the length of the body, second and third joints short, of nearly equal length, the seventh to the eleventh joint thickened and cylindrical, piceous or black, five or six basal joints fulvous. Thorax transversely convex, its sides rounded and widened in the middle, posterior margin broadly produced in middle, surface deeply and closely punctured, interrupted here and there by some smooth semielevated spaces, brownish or greenish æneous. Scutellum as broad as long, in one specimen broader than long, impunctate. Elytra scarcely wider at the base than the thorax, about three times as long, punctured like the thorax, the punctures sometimes confluent and interrupted by four
longitudinal smooth costr which unite near the apex, the outer one being placed close to a longitudinal sulcation which runs parallel with the lateral margin ; the interstices are more or less distinctly transversely rugose. Underside closely silvery pubescent, legs fulvous, last joint of tarsi piceous.

## Genus Prionodera, Chapuis.

## 9. Prionodera godmani, sp. nov.

Elongate. Testaceous ; antennæ with joints 5-7 and 10-12 black ; elytra coarsely punctate and subrugulose, each elytron with a spot at the base and one near the apex metallic green.

Length $4 \frac{1}{2}$ lines.
Hab. Zapote, Guatemala.
Head deeply but not closely punctured, with a shallow fovea between the eyes; antenuæ two thirds the length of the body, testaceous, from the fifth to the seventh and the three apical joints black. Thorax nearly twice as broad as long, its sides tridentate, the posterior tooth obsolete and more rounded, the anterior ones acute and distinct; surface rather convex, closely but not more deeply punctured than the head. Scutellum smooth. Elytra wider at the base than the thorax, deeply and coarsely but irregularly punctured, the puncturing near the suture, however, more regularly striate; the interstices coarsely rugose and transversely wrinkled at the base and near the apes, the latter also distinctly costate, each elytron with two large metallic green patches, one of which, situated at the base, is of a semitriangular shape with its inner margin obliquely cut; the other patch is placed below the middle, of a more rounded shape; neither of them extends to either the lateral or sutural margin. The entire underside and the legs testaceous.

Several similarly coloured species have been described, from all of which the present one is distinguished by the colour of the antennæ, which is constant in all the specimens before me, as well as by the shape and margination of the thorax and the colour of the elytral spots.

Collected by Mr. G. Champion.

## Genus Fidia, Baly.

10. Fidia guatemalensis, sp. nov.

Subcylindric, elongate. Bronze-coloured, closely covered with white pubescence; thorax deeply punctate; elytra coarsely punc-tate-striate, the interstices costate.

Length 2-3 lines.
Hab. Dueñas, Capetillo (Guatemala).
Head strongly punctate, with a short lougitudinal groove in the middle; eyes entire, convex ; antennæ longer than half the body, black, with a greenish hue on the surface of the basal joints, the latter fulvous below; the first six joints (with the exception of the short second joint) slender, filiform, and of nearly equal length, the rest much thicker. Thorax cylindric, slightly contracted at the
base and apex ; surface rather more deeply punctured than the head. Scutellum elongate, pubescent. Elytra much wider than the thorax, parallel, convex, the space below the base very slightly transversely depressed ; humeral callus prominent, smooth ; surface very deeply punctate-striate, the interstices costate and partly, especially towards the sides, transversely wrinkled, here and there covered with more minute punctures, and covered with long whitish stiff hairs. Base of the femora and tibiæ fulvous, apex of latter and the tarsi piceous.

This species, which was sent over by Mr. Champion in numerous specimens, may be readily known from others by its metallic bronze colour and the deep punctured striæ on the elytra.

## Genus Colaspoides, Castlenau.

## 11. Colaspoides batesi, sp. nov.

Broadly ovate, convex; shining metallic green, base of antennæ and palpi fulvous; head and thorax obsoletely punctured, elytra distinctly punctate-striate.

Length $2 \frac{1}{2}-3$ lines.
Hab. Costa Rica.
Head impunctate on the vertex, with a distinct fovea in the middle, clypeus bounded on either side by a deep depression, punctured and obsoletely transversely wrinkled; labrum æneous; antennæ longer than half the length of the body, the four basal joints fulvous, the rest black; apical joint of palpi piceous. Thorax transverse, nearly three times as broad as long, narrowly margined, surface convex, obsoletely punctured. Scutellum large, oblong, impunctate. Elytra slightly wider at the base than the thorax, convex, and obsoletely obliquely depressed below the humeral callus; surface covered with numerous irregular rows of distinct but not deep punctures; interspaces smooth, impunctate. Underside, legs, and tarsi metallic green, the latter rather darker.

To be distinguished from C. smaragdula, Lefèv., and other allied species by its uniform coloration of the legs and tarsi and the obsolete punctuation of the thorax, as well as by the colour of the labrum.

## 12. Colaspoides peruana, sp. nov.

Oblong, convex. Dark violaceous blue, shining; palpi, base of antennæ, and the legs fulvous; thorax distantly, elytra closely punctate-striate.

Length 4 lines.
Hab. Chanchomayo, Peru.
Head deeply but distantly punctate, front impressed in the middle with a longitudinal groove; labrum fulvous; mandibule black : antennæ rather more than half the length of the body, filiform; the third and fifth joints of equal length ; second joint small, ovate ; the four basal joints fulvous, the rest black. Thorax more than three times as broad as long, very convex, the sides and the posterior mar-
gin much rounded, the latter broadly produced in the middle, all the angles acute, the anterior ones slightly produced; surface remotely but distinctly punctured. Elytra broadly oblong, rather convex posteriorly, rather closely and regularly punctate-striate, more distinctly near the base than towards the apex, where the punctures diminish greatly in size. Entirely dark violaceous blue ; underside of the same colour, the legs and tarsi fulvous. Thighs unarmed.

Distinguished from C. alcyonea, Erichs., by its greater size, the coleur of the antennæ and the underside; from C. tibialis, Lefèv., by the uniform coloration of its legs.

## 13. Colaspoides australis, sp. nov.

Oblong-ovate, broad. Bluish æneous beneath, cupreous or violaceous above; base of antennæ, labrum, and legs fulvous; thorax coarsely, elytra substriate-punctate.

Length 3 lines.
Hab. Australia, Queensland.
Upper portion of the head finely, lower portion coarsely punctate ; the apex of the clypeus, labrum, and palpi fulvo-testaceous; antennæ filiform, the first six or seven joints fulvous, the rest black. Thorax twice as broad as long, sides nearly straight at the base, rounded and narrowed towards the apex, the posterior margin being in consequence double as wide as the anterior one; surface convex, not very closely impressed with deep oblong punctures, which are more crowded at the sides than on the disk. Scutellum very broad, smooth, metallic green or cupreous. Elytra slightly depressed below the basilar space, the depression not quite extending to the suture, rather deeply and regularly punctate-striate, the interspaces smooth, but transversely wrinkled below the base near the lateral margins; the latter are also impressed through their entire length with deep punctures; the first two rows of punctures unite before the middle and form one row of closely approached punctures which runs parallel with the suture to the apex, the latter obsoletely costate. Underside piceous with a metallic bluish gloss, legs piceous or dark fulvous, thighs not armed with a tooth.

## 14. Colaspoides unicolor, sp. nov.

Ovate, very convex. Dark violaceous, base of antenuæ and palpi testaceous; head and thoras distantly, elytra closely punctured.

Length 3 lines.
Hab. Choutales, Nicaragua.
Head deeply but not closely punctured, with a longitudinal groove in the middle of the vertex; clypeus more closely punctured, labrum metallic green ; basal joints of palpi fulvous, the apical joint piceous; antennæ filifurm, the third joint very slender and the longest, the fourth half the length, the three or four basal joints testaceous, the rest black with a greenish gloss. Thorax very narrow, at least three times as wide as long, sides evenly rounded, posterior margin much produced towards the middle, anterior one much deflected towards the sides, surface very distinctly punctured on the disk, more closely
towards the sides. Scutellum broad, oblong, impunctate. Elytra convex, the humeral callus but slightly produced, surface very distinctly punctate, the puncturing arranged in irregular rows, dark violaceous blue, shining; innerside of the same colour but with a metallic green tint, particularly visible on the tibix and tarsi.

I add here the diagnosis of two well-marked species contained in my collection, but whose habitat is not known to me at present:-

## 15. Colaspoides decemmaculata, sp. nov.

Oblong-ovate. Ferruginous; head closely puuctate, substrigose at the vertex; thorax less closely, moderately strongly punctate, with four transversely placed small black spots; elytra wider than the thoras at the base, minutely granulate, closely and irregularly punctured, each elytron with five large yellow spots margined with piceous, of which two are placed transversely at the base, two at the middle, and one near the apex.

Length 4 lines.

## 16. Colaspoides variabilis, sp, nov.

Ovate, convex. Fulvous; lower part of head sparingly punctate, the anterior margin with two or three piceous spots; thorax obsoletely punctured, four transversely placed patches and the margins piceous; elytra closely and distinctly semipunctate-striate, each elytron with two longitudinal spots at the base, two other larger ones at the middle, transversely placed, and a large transverse patch near the apex, as well as the suture, ferruginous.

Var. a. Thorax and underside black.
Var. b. Thorax unspotted, elytra with black spots, the basal ones united or normal.

Var. $c$. The patches on the elytra reduced to five or six small black spots, underside piceous, base of thighs and the tibio fulvous.

## Genus Zygogramma, Chevr.

## 17. Zygogramma championi.

Oblong-ovate. Dark æneous, shining, antennæ and tarsi fulvous; elytra irregularly punctured, their lateral margins light flavous.

Length 3 lines.
Hab. Capetillo, Guatemala.
Head deeply but not closely punctured; labrum, palpi, and antennæ fulvous, the latter with their joints gradually thickened and reaching to the base of the thorax, the third joint about double as long as the second. Thoras narrowly transverse, the anterior margins but little concave behind the eyes and almost straight, sides widened and rounded before the middle, parallel thence to the base; surface rather deeply punctured on the disk, intermixed with smaller punctures, very strongly and deeply punctate at the sides; there is also a deep irregular-shaped fovea at each side near the anterior margin. Scutellum large, impunctate. Elytra narrowed towards the apex, deeply and irregularly punctured, with the exception of a regu-
lar row accompanying the sutural margin ; dark æneous, their lateral margins broadly flavous; this band is slightly narrowed and sinuate below the shoulders. There is also in one specimen before me a short stripe of flavous between the margin and the scutellum at the base of each elytron. Underside and legs greenish æneous, extreme apex of tibix and the tarsi fulvous.

Collected by Mr. G. Champion.

## Genus Stilodes, Chevr.

## 18. Stilodes belti, sp. nov.

Ovate-rotundate. Obscure brownish æncous, submetallic ; elytra geminate-punctate-striate, flarous, the suture (widened before and behind the middle) and three longitudinal rows of elongate spots dark brown.

Length $4 \frac{1}{2}-5$ lines.
Hab. Chontales, Nicaragua.
Head distinctly and moderately closely punctured, labrum brown, apex of mandibles and the antennæ obscure piceous; the latter gradually thickened, with their apical joints longer than broad. Thorax transverse, anterior margin straight in middle, posterior one produced, sides rounded, the anterior angles slightly produced; surface coarsely punctured near the sides, more finely on the disk, with a small but deep round fovea at each side, of the same brownish æneous colour, as the head. Scutellum smooth. Elytra convex, geminate-punctatestriate on the disk, more irregularly punctured near the sides, the first sutural stria very short, flavous, with three parallel rows of irregular-shaped dark brown spots placed as follows-the first row on the disk (consisting of four spots of increasing size), the second and third row (of three spots each) placed towards the lateral margin without, however, touching the latter, their two anterior spots joined at the shoulder into an elongate $\Lambda$-shaped mark: two other short stripes are connected with the suture anteriorly and posteriorly. Outer limb, underside, and legs brownish æneous.

## 19. Stilodes flavo-marginata, sp. nov.

Orate, convex. Dark violaceous blue ; elytra punctate-striate, each elytron margined with a broad crescent-shaped yellow band from the base towards the apex.

Length 4 lines.
Hab. Brazil.
Vertex rather convex, with an indistinct middle line; head rather sparingly but distinctly punctured; three lower joints of the antennæ light brown, the rest piceous and gradually increasing in width. Thorax transverse, its sides parallel at the base, rounded towards the apex and finely margined ; surface sparingly impressed with punctures like those of the head, almost impunctate towards the sides. Scutellum smooth, trigonate. Elytra slightly wider at the base than the thorax, narrowed and rounded towards the apex; surface of each elytron impressed with ten rows of rather deep punctures, the first
of which is very short, their interstices also extremely minutely punctate, dark violaceous blue, with a bright yellow band of crescentshape, which, commencing at the base and running parallel with the lateral margin (without, however, quite touching it), turns inwards at a little distance from the apex, towards the suture, which, in the one specimen before me, it does not quite reach. Underside and legs rather darker blue than the upperside.

## Halticine.

20. Crimissa nigro-ornata, sp. nov.

Broadly oblong-ovate. Black, base of antennæ and the femora fulvous; above testaceous. Thorax with three transversely placed black spots. Elytra irregularly punctured, each elytron with a black longitudinal spot on the shoulder.

Length $5 \frac{1}{2}-6$ lines.
Hab. Columbia.
Head swollen, impunctate, with an elongate triangular black spot at the vertex; the space immediately above the insertion of the antennæ but slightly raised and divided by a broad triangular groove, black; apex of jaws and palpi black; antennæ shorter than half the length of the body, with the basal joint slender, curved, and the longest, the fifth joint slightly longer than the rest, first joint entirely testaceous, the second to the fifth spotted with piceous on each side, the remaining joints black with only the extreme base testaceous. Thorax transverse, about three times as broad as long, the anterior and posterior margins produced in the middle, sides nearly straight and widened towards the base; all the angles acute, the anterior ones much produced and pointed; surface slightly convex, smooth, shining, and impunctate, with a round spot at each side and a short longitudinal streak in the middle near the base black. Scutellum pentagonal, obsoletely edged with piceous. Elytra convex, scarcely broader at the base than the thorax, distinctly and rather closely punctured, of the same colour as the thorax, or a little lighter testaceous, with a longitudinal black spot on the humeral callus. Underside black, the femora fulvous, the posterior ones with a black spot ; the tibiæ and tarsi also more or less stained with black.

In one specimen, which may prove to be the female, of rather larger size, the black colour predominates beneath, the spots on the thorax are much enlarged, especially the middle one, and the elytral spots extend in the shape of longitudinal pointed vittæ from the shoulder to nearly the apex.

## 21. Homammatus clarki, sp. nov.

Oval, convex, robust. Dark chestnut-coloured, subpubescent. Antennæ dilated towards the apex, fulvous, the sixth to the ninth joint black; elytra with a small black spot before the middle.

Length $2 \frac{3}{4}$ lines.

Head with the usual transrerse depression, light brown, deeply punctate at the base, leaving, however, a space in the middle of the vertex smooth; anterior part testaceous; maxillary palpi filiform ; antennæ reaching to about one third of the length of the elytra, the first joint much thickened, as long as the third, the second short, rounded, joints sixth to ninth thickened and widened, the rest a little more elongate, closely pubescent. Thorax about twice as broad as long; the anterior angles pointed and slightly produced outwards; sides sinuate near the base, but not angulate; surface with a shallow depression on each side, and a short, raised, longitudinal, smooth space in the middle, not touching either the anterior or posterior margin; the disk covered with punctures as deep as those of the head, more curved near the base and sides than at the anterior portion, and covered sparingly with golden-yellow hair ; an obscure spot of fuscous is visible at each side and on the disk. Elytra much wider than the thorax, convex and subcylindrical, finely punctate striate, more obsolete near the apex, covered also sparingly with silky yellow pubescence; they are slightly depressed before the middle, of a dark chestnut colour, rather shining, and have each an obscure, round black spot placed in the hollow of the depression. Underside and legs lighter-colcured, the posterior thigh with a rather large black patch on the outside; posterior tibiæ near the apex with comb-like teeth and one spur ; claws appendiculate.

Hab. Amazons.
The dilated antennæ, antemedian depression of the elytra, together with the spur at the posterior tibiæ, show this species to belong to Clark's genus Homammatus, although it might perhaps have been placed, with equal right, amongst the genus Homotyphus or allied genera. Von Harold, in the 'Coleopt. Hefte,' has already pointed out the artificial construction of many of Clark's genera, founded very often on doubtful and variable structures of different organs; and it is very possible that the student may often be puzzled as to the genus to which an insect of this family belongs.

## 22. Allochroma bimaculata, sp. not.

Oblong, ovate, robust. Light fulvous, glabrous ; antennæ, the four anterior legs, and a spot on each elytron before the middle black.

Length 3 lines.
Head with a few fine punctures, a round fovea in the middle of the vertex, and a transverse groove between the eyes; another deep longitudinal fovea is situated between the antennæ; the latter are short and robust, entirely black, the first joint is claviform, the second short and rounded, the third nearly as long as the first, the fourth and fifth joints shorter and of equal length, the sixth joint dilated and much more robust than the others, the rest rather short and slightly widened; maxillary palpi robust, the penultimate joint transverse, the last joint conical and pointed. Thorax transverse, all the angles acute and rather produced, the sides distinctly angulated before the middle, thence to the base concave, not straight ; surface rather convex, with two shallow fover at each side near
the base, the space between them also obsoletely depressed; the entire disk very-distinctly but widely punctured, uniformly fulvous. Scutellum impunctate. Elytra wider than the thorax at the base, gradually narrowed posteriorly, with a distinct transverse depression below the base; each elytron with ten rows of deep punctures, which diminish in depth towards the apex; they are of the same colour as the other parts, and have a black round spot exactly at the end of the basilar depression, between the margin and the suture. Underside of a little deeper tint than the upper one. The four anterior legs black; the claws, however, and the posterior ones fulvous. Posterior thighs reaching beyond the apex of the elytra; claws appendiculate; posterior tibiæ with two distinct spurs.

One specimen in my collection from Nicaragua.
The glabrous elytra, shape of the palpi, as well as the organization of the hinder tibiæ, which are armed with two spurs, place this insect in the genus Allochroma as defined by Clark, while the coloration will distinguish it from the other species of this genus.

## Galerucine. Genus Celomera.

 23. Celomera nigricollis, sp. nov.Elongate, subparallel. Flavous; head and thorax piceous or black, finely pubescent; elytra dark purplish-red, finely punctate and pubescent.

Length 6 lines.
Hab. Mountain of Irazu, Costa Rica.
Head deeply foveolate in the middle, obsoletely punctured, black; clypeus flavous; antennæ black, covered with yellowish hairs. Thorax deeply transversely depressed in the middle, with a few other smaller depressions near the sides and base; surface covered with minute punctures and thin yellowish hairs, piceous or black, the margins narrowly fulvous. Scutellum piceous. Elytra convex, widened from the middle to the apex, very closely and minutely punctured, covered thinly with yellowish pubescence of a reddishpurple colour. Underside flavous; tibix and tarsi black.

Nearly allied to C. submetallica, Clark, but separated from that species by the black thorax and the fine punctuation of the elytra, as well as by the almost entirely black head. I have more than half a dozen specimens before me, all of which agree exactly with each other.

Collected by Mr. Rogers.

## 24. Celomera godmani, sp. nov.

Elongate, parallel. Flarous; head and thorax with two large spots ; elytra finely punctate and pubescent, fuscous; tibiæ, tarsi, and antennæ black.

Length 6 lines.
Hab. Chontales, Nicaragua.
Head very minutely punctured, with an indistinct median and a
more distinct transverse groove between the eyes; apex of the mandibulæ piceous; base of the head occupied at each side by a large elongate black spot; antennæ short, black, pubescent. Thorax nearly three times as broad as long, transversely impressed across the entire disk, minutely punctured, flavous or rufous, with a large round black patch at each side near the posterior margin, where the puncturing is a little more distinct. Scutellum flavous, pubescent. Elytra a little wider than the thorax, parallel or very little widened posteriorly, exceedingly close and minutely punctured, of a dark fuscous colour, and covered with thin whitish pubescence. Underside and the femora flavous; knees, tibiæ, and tarsi black.

To be distinguished from C. maculicollis, Clark, by the larger size, the two-spotted thorax, and by the minute punctuation of the latter and of the elytra, while it differs from C. binotata, Dej., in the coloration as well as the sculpture of the elytra.

## Genus Chthoneis, Baly.

25. Chthoneis jansoni, sp. nov.

Elongate, parallel. Black; head and thorax flavous; four apical joints of the antennæ testaceous; elytra violaceous, closely punctured, and transversely rugose.

Length 3 lines.
Hab. Chontales, Nicaragua.
Head impunctate, deeply transversely grooved between the eyes; labrum and palpi piceous; antennæ as long as the body, closely pubescent, with the exception of the first joint, second and third joints short, black, the last four joints testaceous or flavous. Thorax transverse, about twice as broad as long, anterior margin slightly concave in the middle, sides narrowed at the base; surface moderately convex, impunctate, shining flavous. Scutellum black. Elytra wider at the base than the thorax, closely and distinctly punctured ; the interstices transversely wrinkled or semireticulate; entirely dark violaceous, semiopaque. Underside and legs black, covered with whitish pubescence.

The colour of the head and thorax principally distinguishes this species from C. apicicornis, Baly.

Collected by Mr. Janson.

## 26. Cethoneis smaragdipennis, sp. nov.

Elongate, parallel. Flavous; antennæ, tibiæ, and tarsi black; thorax transversely foveolate; elytra bright metallic green, closely rugose punctate.

Length 3-3 $\frac{1}{2}$ lines.
Hab. Capetillo, Guatemala.
Head not longer than broad, vertex with a few minute punctures, carina and encarpæ ill-defined; antennæ as long as the body in the male, shorter in the female, second and third joint very small, moniliform, fourth joint longer than the first three joints together. Thorax subquadrate, its sides widened in the middle and contracted
near the base; surface impunctate, very shining, flavous, the disk near the base deeply but irregularly transversely foveolate. Scutellum flavous. Elytra wider than the thorax, very bright metallic green, closely and rather coarsely rugose-punctate ; tibix and tarsi black, first joint of latter longer than the following joints together. Claws appendiculate.

This species seems to form a comnecting link between the genus Scelida of Chapuis and the present one; it may with equal right be classed amongst the first on account of the unarmed tibix and other characters; but as in Scelida the third joint of the antennæ is much longer than the second, while here it is as short, I have included it in the present genus, although it differs from the typical species in not having the joints of the antennæ dilated.

## Genus Scelida, Chapuis.

27. Scelida viridis, sp. nov.

Elongate, parallel. Metallic green, pubescent below ; head, thorax, antennæ, and legs flavous; elytra closely rugose-punctate, metallic green.

Iength 6 lines.
Hab. Mexico.
Head elongate, vertex swollen, with a deep fovea in the middle, apex of jaws piceous; antennæ half the length of the body, the second joint short, the fourth slightly longer than the third. Thorax nearly square, its sides, from the middle to the base, nearly parallel; surface impunctate, with a deep oblique fovea at either side. Scutellum flavous. Elytra much wider than the thorax, parallel, closely rugose-punctate. Underside metallic green, the sides of the breast and the posterior margins of the abdominal segments closely covered with long white hairs. Legs entirely flavous.

Of the two other described species, S. elegans, Chapuis, and S. balyi, Jacoby, the present one will be easily recognized by its green underside and the entirely flavous antennæ and legs.

## Genus Monotia, Le Conte.

## 28. Monotia viridis, sp. nov.

Oblong-ovate, convex. Obscure flavous beneath ; above dark olivegreen, opaque, finely punctate and pubescent.

Length 4 lines.
Hab. Zapote, Guatemala.
Head with a longitudinal middle groove, rather deeply and closely punctured, clypeus narrow, trausverse; labrum obscure piceous: antennæ about half the length of the body, the basal joint olivegreen, the following joints testaceous, the last three piceous or black; the first and fourth joints are of equal length, the second half the size of the third. Thoras transverse, sides slightly angulate before the middle; surface obsoletely impressed near the anterior and lateral margins, finely and not distinctly punctured.

Scutellum large, its apex rounded, flavous, impunctate. Elytra slightly widened posteriorly, convex, minutely punctured, and covered with yellowish pubescence, which, however, is only visible in a certain light; the dark green colour is like that of the thorax, here and there stained with purplish patches, but without possessing any gloss. Underside, as well as the inside of the posterior femora, flavous ; legs olive-green, shining ; tibiæ simple, unarmed, claws bifid.

Collected by Mr. Champion.

## Genus Oides, Weber.

## 29. Oides albertist.

Oblong-ovate, convex. Testaceous; elytra closely punctate, fulrous, a large square patch at the base and another semitriangular one near the apex black.

Length 5 lines.
Hab. Somerset, Australia.
Vertex convex, smooth, with a fine longitudinal groove, and a deep transverse depression in front of the antennæ; the latter entirely testaceous, the second joint half the size of the first, third and fifth of equal length, fourth longer than either. Thorax nearly three times as broad as long, surface obsoletely punctured, with two or three obscure shallow depressions, testaceous, shining. Scutellum testaceous. Elytra slightly widened behind the middle, closely and distinctly punctured, fulvous, shining; each elytron with a large square patch at the base, neither reaching the sutural nor lateral margin, and another equally broad but more triangularly-shaped patch near the apex, black ; the latter spot is also interrupted narrowly by the suture, and more broadly by the lateral margin. Entire underside and the legs testaceous.

This species is closely allied to $O$. rubrum and $O$. ornatum, Baly, but differs from the first in the colour of the antennæ and the basal markings of the elytra (which in the present insect do not reach to the lateral margin), and from the second by the pale coloration of the underside and also of the antennæ.

Collected by M. D'Albertis.

## Genus Agetocera, Hope.

30. Agetocera flafiventris, sp. not.

Elongate, robust, convex. Black, shining; antennæ flavous, their apex piceous; elytra violaceous, abdomen flavous.

Length 5 lines.
Hab. India.
Head elongate, with a deep groove between the eyes; base and apex of labrum fulvous; antenuæ ( 오) filiform, basal joint thickened, second short, third to the seventh joints equal, the eighth and following the longest, the joints increasing in thickness from the fourth to the ninth. Thorax transversely subquadrate, sides narrowly margined, dilated anteriorly ; surface smooth, impunctate, deeply impressed behind the middle with a transverse short groove,
black, shining. Scutellum black, trigonate. Elytra dilated posteriorly, with a shallow depression below the basilar space, and several others near the lateral margins; another longitudinal sulcation runs parallel with the latter, but finishes at some distance before the apex; surface minutely and closely punctate, dark violaceous blue. Underside and legs black; abdomen flavous.

I unfortunately possess only one specimen, and that a female, of this distinctly-coloured species; the antennæ in the male will probably show the same dilatation as in the other species belonging to this genus.

## Genus Nestinus, Clark.

## 31. Nestinus flayo-marginatus, sp. nov̀.

Elongate, parallel, rugosc-punctate; finely pubescent. Flavous; base of the head, three transversely-placed spots on the thorax, antennæ, tibiæ, and tarsi black; elytra metallic cupreous, the margin flavous.

Length $5-5 \frac{1}{2}$ lines.
Hab. Mexico.
Head rugose-punctate, with a fine longitudinal median groove at the vertex extending to the clypeus, flavous, with an elongate black spot from the middle of the base to almost the anterior margin of the eyes; apex of labrum and the palpi black; antennæ about half the length of the body, black, basal joint thickened, robust, second short, third of double the length, fourth joint longer than the third and the longest. Thorax transverse, sides nearly parallel, all the angles slightly thickened, the posterior ones oblique; surface obliquely depressed at each side, longitudinally grooved in the middle, irregularly rugose-punctate, flavous, a spot at each side near the lateral margin, and another in the middle, a little distance from the base, black. Scutellum black, finely punctate and pubescent. Elytra closely rugose-punctate, finely flavous-pubescent near the margin, metallic cupreous, the lateral margins and apex flavous. Tibiæ and tarsi black. Claws bifid.

The flavous margination of the elytra will distinguish this species from those described by Clark.

## Genus Drabrotica.

## 32. Diabrotica marginella, sp. nov.

Subelongate, widened behind. Flavous; antemı (joints seventh and eighth excepted), base of head, and two spots on the thorax greenish black. Elytra strongly punctate, broadly margined, metallic green, lateral and sutural margins, as well as the apex, flavous. Upper surface of femora and the tibie and tarsi black.

Length 3-4 $\frac{1}{2}$ lines.
Hab. Costa Rica.
Head longer than broad, swollen, impunctate, front impressed with a small fovea; encarpæ obsolete; carina not risible; lower part of face flavous, labrum and vertex blackish green; antennæ two thirds the length of the body, filiform, the second joint short, the rest of
nearly equal length, black, the seventh and eighth joints light flavous. Thorax transverse, sinuate bebind the middle, anterior angles slightly prominent ; surface impunctate, flavous, with a large black spot at either side. Scutellum black. Elytra dilated posteriorly, broadly margined at the middle; surface strongly and closely punctured, metallic green, the margins and suture narrowly, the apex broadly flavous.

## 33. Diabrotica foveipennis, sp. nov.

Oblong. Flavous; thorax bifoveolate, minutely punctate; elytra finely but distinctly punctured, flavous, the suture (narrowly) and four very obsolete spots on the disk ferruginous, lateral margins interrupted in the middle by a deep fovea.

Length $3 \frac{1}{2}$ lines.
Hab. Dueñas, Guatemala.
Head very finely punctured, as long as broad; front with a small fovea; encarpæ and carina distinct; antennæ filiform, longer than half the body, second joint short, third of double the length, entirely flavous. Thorax transverse, subquadrate, sides finely margined, strongly contracted behind the middle, anterior angles not pointed, posterior ones slightly thickened, surface minutely punctured, bifoveolate on the disk, the fover closely approached. Scutellum smooth. Elytra slightly widened at the middle, closely and more deeply punctured than the thorax, each elytron with a deep fovea, situated immediately before the middle of the lateral margin, the latter itself being produced at that place into a triangular tooth, while the interior of the fovea contains another still more pointed triangular elevation ; two indistinct spots, one before the other behind the middle, on the disk of each elytron, as well as the suture narrowly, ferruginous. Underside and legs entirely flavous. Claws appendiculate.

Collected by Mr. Champion.
This and the following species I rather reluctantly describe under the generic name of Diabrotica, on account of their appendiculated claws and the curious elytral fover. The latter character, I think, is peculiar to the male insect; but as in all other particulars the species agree with Diabrotica, I have placed them there for the present.

## 34. Diabrotica tripunctata, sp. not.

Elongate. Obscure fulvous, base of femora and the antennæ black; vertex ferruginous; above yellowish or light testaceous, opaque. Scutellum, three triangularly placed spots on each elytron, and the suture black.
$\delta^{\circ}(?)$. Elytra with a deep fovea near the lateral margin, before the middle.

Length 4 lines.
Hab. Capetillo, Dueñas (Guatemala).
Head not longer than broad, longitudinally and transversely grooved between the eyes; vertex ferruginous, lower part of face light testaceous; antennæ of the same shape and length as the pre-
ceding species, black. Thorax transverse, widened in the middle, the base contracted; surface minutely punctured, yellowish white, with an indistinct longitudinal fuscous line in the middle, sometimes entirely absent. Elytra rather convex, almost subcylindrical, scarcely more distinctly punctured than the thorax; two small spots, one of which is placed before, the other behind the middle, near the sutural, and a third spot between the two, near the lateral margin of each elytron, black. Underside fuscous or dark ferruginons, more or less stained with black. Legs flavous, base of the femora as well as the apex of the tibix and tarsi more or less black. In the specimens which I take to be male, there is the same deep fovea near the lateral margin ; but the latter itself is not interrupted as in the preceding species, and the internal tooth is not isolated, but connected with the sides of the fovea in the shape of a convex ridge. Claws appendiculate.
35. Diabrotica imitans, sp. nov.

Oblong-ovate, dilated posteriorly. Black, base of head and the thorax fulvous ; antennæ (their apex excepted), legs, and elytra bright flavous, the latter with four basal spots and two broad transverse bands black.

Var. The basal spots on the elytra united in the form of a third transverse band.

Length 3 lines.
Hab. Venezuela.
Lower part of face deeply excavated ( $\mathrm{O}^{*}$ ), shining black, vertex and sides of face fulvous, the former with a few small punctures; basal joint of the antennæ very long and slender, as long as the fourth, second joint less than half the size of the third, first five or six joints flavous, the rest piceous. Thorax subquadrate, the hinder angles oblique, sides armed with a small tubercle at each side below the anterior angles; surface obsoletely transversely depressed, minutely punctured. Scutellum black. Elytra wider than the thorax, much dilated behind the middle, convex, deeply punctured, the interstices obsoletely rugose; flavous, two elongate spots at the base of each elytron (in the variety united into a band), a transverse regular band at the middle not touching the lateral margin, and another wider one near the apex black.

In the female the deep excavation of the head is wanting, and the fulvous colour extends much lower down, This species is at once distinguished from D. ventricosa, Jacoly (to which it is nearly allied in colouring), by the flavous margination of the elytra.
36. Diabrotica fenestralis, sp. nov.

Elongate, sulparallel. Flavous; head, legs, and breast black; elytra flavous or testaceous, with the lateral and sutural margins and three transverse narrow bands, the first of which is connected with the second by a short lateral stripe, piceous.

Length 3 lines.
Hab. Chontales, Nicaragua, and Costa Rica. roc. Zool. Soc.-18j9, No. LI.

Head impunctate, with a forea between the eyes, black, the latter very convex and large; antennæ two thirds the length of the body, second and third joints very short, light piceous, two basal joints and the ninth and tenth light flavous. Thorax a little broader than long, the sides narrowly margined, the angles not produced, surface smooth, slightly convex, impunctate, light flavous, shining. Scutellum black. Elytra very closely and distinctly punctate, the margins and apex, as well as the base, a narrow transverse band immediately before and a second behind the middle, piceous; an oblique thin streak commencing at the humeral callus comnects the basal with the first band ; all these bands are sometimes more or less interrupted. Legs and breast black, abdomen flavous.

## Genus Cerotoma, Erichs.

## 37. Cerotoma atro-fasciata, sp. nov.

Elongate. Black; thorax flavous, impunctate; elytra pale testaceous, a narrow transverse band at the base, dilated at the suture, and two small spots near the apex, black.

Length $2-2 \frac{1}{2}$ lines.
Hab. Guatemala.
Head black, shining, vertex distinctly but fincly punctured, with a fovea in the middle; epistome coarsely punctured, its anterior margin concave ; antennæ black or dark piceous, the base of the second and third joints paler, joints first and third long, of equal length, the rest short, pubescent. Thorax transversely quadrate, its sides narrowly margined; surface slightly conves, impunctate, flavous, this colour, however, often broken and obscure along the anterior and posterior margin. Scutellum black. Elytra gradually widened posteriorly, rather closely and distinctly punctate-striate, of a pale testaceous colour, with a more or less distinct longitudinal patch of fuscous on the disk below the middle; a narrow transverse black band, common to both elytra, is placed at the base, it commences at the shoulder, and is triangularly dilated below the scutellum at the sutural margin, where its point reaches to about one third of the length of the elytra; a small black spot is also placed near the apex of each elytron, at a little distance from the sutural angle. Underside black; femora and the anterior tibiæ flavous, each with a black dorsal streak ; rest of the tibiæ and tarsi and the apex of the posterior femora black.

Collected by Mr. O. Salvin.

> Genus Enidea, Baly.
38. Enidea bipartita, sp. nov.

Elongate. Flavous; antennæ with the second to the fifth joint black, the third excavated near the apex; thorax transversely depressed. Elytra minutely punctured, the basal half black, the posterior one fulvous.

Length $4 \frac{1}{2}$ lines.
Hab. Sumatra.

Head very wide, vertex impunctate, encarpe divided by a deep groove; face deeply excavated immediately below the antennæ, the anterior part of which is bounded at either side by a rounded lobe, while the latter are covered at their outer edge with long bristlelike hairs; penultimate joint of the maxillary palpi greatly swollen and dilated, the apical joint being almost buried in it ; antennæ as long as the body, the first joint very slender and curved, the second very short, third joint as long as the first, dilated at the apex and deeply excavated, fourth and fifth joints nearly equal in length and as long as the first, covered, as well as the rest of the joints, with fringes of short hairs. Thorax transverse, sides greatly diverging from the base to the middle, from there to the apex produced and rounded; surface foreolate, either side near the base impunctate. Scutellum flavous, broad. Elytra convex, transversely depressed below the base, scarcely visibly punctured, from base to middle black, thence to the apex fulvous. Tibix and tarsi black.

Only a single specimen, a male, is known to me.

## 4. Note on a Specimen of Charybdea haplonema.

 By Prof. J. Reay Greene, B.A., M.D., F.L.S., F.Z.S., \&c.[Received November 29, 1879.]
Dr. Pye-Smith, now Assistant Physician to Guy's Hospital, found, some years since, in the Museum of that institution, a nameless Medusa of strange appearance, from an unknown locality. Noting its exceptional form, he made a drawing of it, and at the same time observed such of its structural peculiarities as could be studied with due regard to the conservation of the single sample at his disposal. He also took the trouble of bringing the specimen to the meeting of the British Association at Belfast ; but no one there could tell him to what group of jelly-fishes it should be referred. Hearing of this failure, I applied during the spring of the present year to Dr. PyeSmith, who most kindly gave me every opportunity of examining this remarkable Medusa at my leisure.

I soon found that I had not to deal with an undiscovered species, but with none other than the Tamoya haplonema of Fritz Müller. It belongs to Gegenbaur's Charybdeidre, a group not represented among the Medusæ of the British coasts.

Tamoya haplonema was described and figured twenty years ago by its discoverer, who found it on the shores of Santa Catharina (Brazil) -"am Strande der Praia de fora bei Desterro." It was not uncommon, more than a dozen specimens being sometimes procurable during one day. Occasionally it was accompanied by the much rarer $T$. quadrumana. No other naturalist appears to have met with these acalephs.

Our Medusa, howerer, is very closely allied to Charybdea marsupialis, the common marsupial Medusa of the Mediterranean. This species, the first discorered and best-known member of its group, is
the only charybdeid which has been reinvestigated by several observers. In particular Claus has just given us a monograph describing and illustrating, with great minuteness of detail, the form and structure of this common Mediterranean Medusa. His essay may justly rank as the most thorough analysis, hitherto published, of the anatomy of any Medusa whatsoever.

The affinity here noted was perceived by Fritz Müller, who at once referred his Medusæ to Gegenbaur's Charybdeida, in the definition of which family he proposed some modifications, to adapt it for the reception of the two species of the new genus Tamoya. The characters of the latter he contrasted with those of Charybdea ( $=$ C. marsupialis only) in parallel columns. But writing in 1859, at a distance from Europe, Fritz Müller needed the data we now possess for such a comparison. Claus, with his better knowledge of the Mediterranean species, has shown that the differences on which his predecessor relied do not in fact exist. We cannot estimate as of generic value the characters which separate C. marsupialis from T. haplonema. These Meduse are therefore now placed in one genus (Charybdea of Claus, not Péron and Lesueur). They are very like one another, though both are obviously distinct from the rarer Brazilian species, T. quadrumana, for which the genus founded by Fritz Müller may still be retained.

The Brazilian is indeed much larger than the Mediterranean Charybdea, and in this respect resembles one of the unnamed Charybdeida (from the Philippine seas) provisionally described and figured in outline by Semper, who doubts the specific identity of any of his own forms with either of those discovered by Fritz Müller.

The Charybdeide are, unquestionably, of the greatest interest to any person wishing to understand the classificatiou of the Hydrozoa. They occupy an intermediate position between the lower and the higher Medusæ, although, arbitrarily, they may be placed with the latter. Their (1) external morphology, (2) curiously modified coelenteric system, (3) genitalia quite distinct from the central region of the bell, with its four accessory cavities for the gastric tentacles, (4) muscular apparatus, and (5), above all, their very distinct nervous ring and wonderfully complicated sensory organs display a number of characters, the study of which must amply reward every earnest student of the lower animals. The whole of this subject, to which, sixteen years ago, I endeavoured to direct attention, is now, at length, admirably presented in the work of Claus.

No English zoologist has written on the Charybdeida; nor, so far as I am aware, has any paper on the Medusse been read before our Society since Edward Forbes, in 1851, made a communication on Equorea. But the study of the Charybdeidae is so important that I have thought it desirable to append to the present note a brief history of the literature of these animals.

Plancus (1739) was the first to describe and figure one of the Charybdeida. His "urtica soluta marsupium referens" is the
common Mediterranean species. The rude, scarcely recognizable, figure is spoken of as "a very miserable representation" by Edward Forbes ${ }^{1}$.

Risso ${ }^{2}$, in 1826 , gave a very imperfect account of the species of Plancus, under the name proposed for it by Péron.

Milne-Edwards (1833) took the lead among modern naturalists in adequately redescribing this singular acaleph, whose marginal bodies were more fully analyzed by Gegenbaur in 1856. Gegenbaur again directed attention to C. marsupialis in his systematic essay on the Medusæ, based chiefly on Mediterranean studies. Gräffe (1858) also described it, noticing more especially its marginal bodies and bunches of gastric tentacles. Costa (1836) must be added to the list of original observers of the same species. Kölliker (1866), using the results of his own studies, briefly compared the minute structure of its gelatinous disk with that of other Meduse. Finally (1878) appeared the crowning work of Claus.

Of the other Charybdeida much less is known. Each species named in the annexed list appears to have been seen by one observer only. None is described in a manner at all satisfactory, if we except the two species of Fritz Müller.

```
Charybdea, Pér. & Le S. }\mp@subsup{}{}{3
    periphylla, Pêr. & Le S:3 ........ Equatorial Atlantic.
    bicolor, Quoy &% Gaim.4 ........ Cape-Verd Islands.
    bitentaculata, Quoy &f Gaim.5 ... Amboina.
    campanella, Less.6 ................. African Seas.
    alata, Reynaud}\mp@subsup{}{}{7}.. ................ Atlantic Ocean.
Tamova, F. Müll. }\mp@subsup{}{}{8
    haplonema, F. Miull. }\mp@subsup{}{}{8}\mathrm{ ........... Santa Catharina.
    quadrumana, F. Miill.'........... Santa Catharina.
Marsupialis, Less.9
    flagellata, Less.0}\mp@subsup{}{}{10}................ New Guinea
Bursarius, Less. }\mp@subsup{}{}{1/
    cythereæ, Less. }\mp@subsup{}{}{12}................... New Guinea.
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Thus Charybdeida have been found along the western shores of the equatorial Paciic and the adjacent parts of the Indian Ocean, in

[^71]the tropical and subtropical regions of the Atlantic, and in the Mediterranean ; while in latitude they extend from Nice and the Adriatic (C. marsupialis) to Santa Cathariua.

According to Agassiz ${ }^{1}$, "Charybdea bitentaculata, Q. and G., is a Campanella ${ }^{2}$; Ch. bicolor, Q. and G., constitutes a distinct genus, Quoya, Ag. ; Ch. campanella, Less., may also constitute a distinct genus."-"It remains doubtful to what genus Lesson's Marsupialis flagellata, from New Guinea, ought to be referred. It constitutes, probably, a distinct genus, on account of its tentacles."

Semper has given us precursory notices of some half-dozen species of Charybdeide from the Philippine shores. The full details of his researches on these and other acalephs are looked forward to by many naturalists with great interest ${ }^{3}$.

1 'Contributions, vol. iv. p. 174.
${ }^{2}$ To which genus Agassiz also refers Charybdea capitulum, Q. \& G. MS., De Bl. auct. See his explanatory note in ' Oontr.' vol. iv. p. 169.
${ }^{3}$ Semper found three species round the Pelew Islands. The first was more than $7^{\prime \prime}$ high, scarcely $3^{\prime \prime}$ across. Wall of disk extraordinarily thick, almost cartilaginous, quite colourless and transparent. The four tentacles were torn off just beyond their broad cartilaginous basal portions. A wide depending veil. Margin weakly lobed : just above it, in as many depressions capable of being closed, were the four marginal bodies. Manubrium dependent, not lobed. Central cavity of disk small. Lateral pouches very broad trom their origin: between two contiguous pouches the umbrellar and subumbrellar walls were in coutact, gising rise to the false appearance of a canal. Gastrictentacles in four double groups about the central cavity. But one (not-sexual) example (Taf. xxxix. f. 9).

The disk of the second species was only $1 \frac{1}{4}$ " high, $7^{\prime \prime}$ across. Tentacles extensile to about twice the length of disk, with narrow basal lobes. Veil more complicated than in last species, always elerated, and held in this position by four subumbrellar septa, each springing from the mid line of a swelling, on the umbrellar aspect of which is the depressed cavity, opening outwards, whence the marginal body arises: septa perpendicular to subumbrella, and extending across the veil, which by them is hindered from assuming a horizontal position. Into each of the four broad lateral pouches freely project two sexual laminæ, of which one arises on either side of the partition between two adjacent pouches. Sexual products discharged through a single series of small openings, which run close beside the attached border of each genital plate and lead into the Iateral pouches. Manubrium short, four-lobed. Central carity wide, with four double groups of gastric tentacles (Taf. xxxix. f. 8).

A conspicuous nerve-ring exists in this and the preceding species. It pursues a zig-zag course (with eight octants), ascending slightly on either side of each marginal body, then descending and reaching its lowest point near the outer margin of the disk in the mid line of a tentacular lobe.

The third species, scarcely $\frac{1_{2}^{\prime \prime}}{2}$ high, differs in many points essentially from the two others. Tentacles four, ringed with brown and yellow, destitute of basal lobes. Of a beautiful yellow tint were likewise the sexual laminx and four groups of gastric tentacles. No veil. Margin strongly eight-lobed, bearing a shorter rudimentary tentacle between every two principal tentacles. The four very broad lateral pouches interrupted in their inferior third by thickenings of the substance of the disk, constituting the floors of the small carities for the four marginal bodies. Each of the eight sexual laminæ much indented about the middle of its free margin. Only two examples were secured; so that some structural features could not be clearly determined (Reisebericht, 1863).

A fourth species, fished up in May during a royage from Manila to Komblon, was very like one of the forms just noticed. From July to September. Semper

We may now trace the attempts of successive zoologists to interpret Charybdeidce. Linnæus records the species of Plancus in the Systema Naturæ (ed. xii. p. 1097) ${ }^{1}$ as Medusa marsupialis. He is followed by Gmelin ${ }^{2}$ and Modeer ${ }^{3}$.

In 1809 Péron and Lesucur found the genus Carybdea. It includes their new species (C. periphylla) together with that of Plancus. Lamarck ${ }^{4}$, Cuvier ${ }^{5}$, Goldfuss ${ }^{6}$, Schweigger ${ }^{7}$, the editors of the Encyclopédie Méthodique ${ }^{8}$ and Latreille ${ }^{9}$, accept the new genus.

Eschscholtz does not cite Péron's new species or genus. He refers the species of Plancus to Oceania as O. marsupialis ${ }^{10}$.

Milne-Edwards suggests the affinity of C. marsupialis to C. alata, Reynaud, and Bursarius cytherece, Lesson.

De Blainville ${ }^{11}$ retains the genus of Péron, and gives in his Atlas the first copy of Lesueur's previously unpublished figure of C. periphylla. Coloured figures of this species (likerise copied from Lesueur's drawing) and of C. marsupialis (original) are added by Milne-Edwards to the large illustrated edition of "Le Règne Animal.'

Lesson ${ }^{12}$ is the first to break up the genus of Péron. His Carybdea includes C. periphylla, while the species of Plancus is referred (as M. planci) to the new genus Marsupialis. This procedure is subsequently sanctioned by Agassiz. Lesson proposes the two tribes of

[^72]Carybdee (Carybdea, Obelia) and Marsupialef (Marsupialis, Bursarius, Mitra, Eurybia, Cyteis, Campanella, Scyphis). He has "associated with both of them several species which have not the remotest affinity with the type."

Lütken ${ }^{1}$, in a critical revision of the lower Medusæ, places Ca rybdea at the head of his family Eginece. Burmeister ${ }^{2}$ follows him.

Gegenbaur ${ }^{3}$ differs both from Lesson and Lütken. He establishes the family Charybdeide, placing it with the higher Medusæ (his Acraspeda).

Fritz Muiller ${ }^{4}$ discusses the structure and classificatory value of the peculiar gastric tentacles of the higher Medusæ. In a later essay ${ }^{5}$ he proposes the following arrangement.
Egivoida ( (Fginex, Lutk.).
a. Lower. Cunina (Egina rosea, Eschsch.); Egineta; Polyxenia; Eginopsis bitentaculata.
b. Higher: Charrybdeida. Eginopsislaurentii (?); .Egina (citrea); Charybdea (marsupialis); Tamoya; Periphylla (Ch. periphylla, Pér.).
The Ayinoida here constitute an order of Hydromedusce, equivalent to the orders Siphonophorc, Hydroida, and Acalephee (R. Leuckart, =Phanerocarpe, Eschsch.). Fritz Müller has conscientiously endearoured to group the results of his own investigations with every regard to the labours of his predecessors.

Agassiz (1862) more fully expresses somewhat similar opinions in the annexed tabular view (here condensed) ${ }^{6}$.

Order DISCOPHORE.
Suborder 1. RHizostomes.
Suborder 2. Semeostomex.
Suborder 3. Haplostomee.
1st Family. Thalassantuee, Lesson (= Eginidæ).
2nd Family. Brandtide, Agass.
Dodecabostrycha, Brandt.
Quoyia, Agass. (=Carybdea bicolor, Q. \&f G.).
3rd Family. Charybdelde, Less. Charybdea, Less., after $P . \mathscr{\&} L .(=0$. periphylla only).
4th Family. Marsupialide, Less.
Marsupialis, Less. (=M. planci).
Tamoya, Fritz Milller.
T. haplonema.
T. alata (=Carybdea alata, Reynaud).

Bursarius, Less, 1836 (A misprint for 1830).
Chiropsalmus, Agass, (=Tamoya quadrumana).
5th Family. Lucernariade, Johnst.

[^73]One cannot but regard the family of Brandtidæ as doubtful. Was not Brandt right in constituting his Dodecabostrycha ${ }^{1}$ a subgenus of Chrysaora? It differs from the latter, and resembles the Charybdeidee, chiefly in so far as it is quadripartite. The genus Quoyia ${ }^{2}$ is very obscure. As to the two other families of Agassiz, it seems inconvenient to revive Lesson's nomenclature. Fritz Müller is certainly right in retaining the generic name Charybdea for the first-discovered species of the group. In this he has the support of his predecessors (including Péron himself) as well as of most later writers, such as Gegenbaur, Gräffe, Kölliker and Claus. It may be true that Péron regarded his own species ${ }^{3}$, and not that of Plancus, as the type of his genus. In so doubtful a case the free action of the law of priority in nomenclature is certainly impeded. Agassiz and Haeckel are the only two zoologists who have given their sanction to Lesson's innovations. They have by so doing tended to promote confusion, and unnecessarily opposed themselves to a large working majority of their brethren. As to the genus Chiropsalmus, since Claus has shown T. haplonema to be a true Charybdea, it becomes a synonym of Tamoya proper.

Gegenbaur's family is adopted by myself ${ }^{4}$, by Victor Carus ${ }^{5}$, and at a later period by Schmarda ${ }^{6}$.

Fritz Müller, in a letter to Alexander Agassiz ${ }^{7}$, considers it highly probable that Trachynema may be the young of Tamoya. Subsequent researches of Mecznikow ${ }^{8}$ show this view nut to be tenable.

Haeckel, in $1866^{9}$, adopted Lesson's two families, Charybdeidae and Marsupialida, as revised by Agassiz. He associated them in one order, Elasmorchida, under his subclass of Trachymedusee ${ }^{10}$.

Haeckel is about to issue a great work on the Medusæ in the (postponed) first volume of the new 'Jenaische Denkschriften.' Meanwhile he has published his "System of the Meduse" "1. Of this group he recognizes two primary divisions, the second of which includes Gegenbaur's Acraspeda together with the Lucernaria. These last make one order (Scyphomeduse), while the Phanerocarpa of Eschscholtz constitute another (Discomedusce). Between Scypho- and

[^74]Discomeduse Haeckel places the Charybdeide, arranged under two orders and five families, as follows:-

> Conomeduss. Charybdeidx. Bursaridæ. Chiropsalmidx. Peroancnusæ. Periphyllidx. Pericryptidx.

Haeckel, therefore, as touching the genera Charybdea and Periphylla, would seem to have reverted to the nomenclature of Fritz Müller. His work is impatiently expected, since his opportunities of studying the Medusæ have been varied and extensive. The deepsea forms obtained during the voyage of the 'Challenger' have also been intrusted to him. We do not know what new Charybdeida he has investigated, or whether he is justified in his apparently extreme subdivision of this group. So copious and diversified an assemblage as the Phanerocarpe will probably by most zoologists continue to be regarded as of higher rank than either of the two moieties of Gegenbaur's single family, notwithstanding that the Charybdeida of the latter are structurally more modified and more numerous than Gegenbaur, writing in 1856, could have supposed.

Before instituting his own researches on Charybdea, Claus ${ }^{1}$ reviewed with care what had been done by others. While pointing out a number of discrepancies, he shows the true significance of the structure of these Meduse, and demonstrates their affinities with great clearness. His results, critical and original, are well epitomized in his 'Zoologie's. He neglects many ill-defined species, and thus arranges the few which have hitherto been properly deseribed and figured.

> Suborder LOBOPHORA $s$. MARSUPIALIDA. Family Charybdeide.

> Genus Charybdea, Pér.
> Ch. marsupialis, Pér. \& Le S.
> Ch. haplonema, Fr. Müll.
> Genus Tamoya, Fr. Müll.
> L'. quadrumana, Fr. Müll.

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${ }^{1}$ Busk was the first English naturalist to give a more accurate and critical account of the marginal bodies of the Medusæ. See his "Observations on certain points in the Anatomy of a species of Thaumantias," in Trans .Micr. Soc. London, vol. iii. p. 22 (1852).

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Quoy et Gaimard.-Voyage de l'Astrolabe (sous d'Urville). Les Zoophytes. Tome iv. de la partie zoologique, et Atlas zoophytologique. 1833. See pp. 293-296, and pl. 25. figs. 1-5.
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Risso, A.-Histoire naturelle des principales productions de l'Europe méridionale. Tome v. 1826. See p. 294.
Semper, C.-Reisebericht. Zeitschr. f. wiss. Zool. Bd, xiii. (1863) pp. 558-570, and Bd. xiv. (1864) pp. 417-426. See pp. 561 and 421 .

## 5. On a Four-horned Chamois.

 By Edward R. Alston, F.L.S., F.Z.S., \&c.[Received December 10, 1879.]
Mr. Sclater has asked me to describe the monstrous horns of Rupicapra tragus (Gray) which he exhibited at the meeting of the 18th November on behalf of Mr. Rowland Ward ${ }^{1}$.

This interesting specimen has been a good deal injured and carefully repaired; but fortunately the frontal sinuses and bases of the horn-cores are uninjured, so that there can be no doubt as to the genuineness of the deformity. The four horns are all perfectly wellformed and symmetrical, the normal pair measuring about 8.75 inches along their anterior curve, and indicating that the animal was an adult male, at least five years old. The abnormal horns grow from close to the bases of the usual pair, on the outside and a little to the rear; they are equally well formed, but are less curved and much shorter, measuring 5 and 5.25 inches respectively. The cores of the normal and abnormal horns are continuous at their bases, separating a little above the level of the frontal bone; and the air-siuuses extend into both of them ; so that the deformity really consists in a bifurcation of the core, each duplication being covered by a distinct hornsheath.

I have not been able to find any record of a similar abnormity in the Chamois in the works of Swiss or German zoologists; nor have I ever seen any exactly similar monstrosity in any other animal. In the "Many-horned Sheep" of the Hebrides the attachment of the supplementary horns is usually very irregular, and does not seem to be due to duplication of the cores. Colonel Godwin-Austen, however, informs me that in Kishtwar (a district south-east of Kashmir) the natives carefully preserve a breed of four-horned sheep, in which

[^76]
the horns are very symmetrical, as a rule, and are set somewhat as in the present specimen.

Unfortunately nothing can be learned of the history of these


Abnormal horns of Ohamois.
curious horns, excepting that they were bought by Captain Towneley Parker at Nürenberg. Probably the animal was killed in the Bavarian highlands, where Chamois are still tolerably numerous ${ }^{2}$.
6. On certain obscure Species of Siberian, Indian, and

Chinese Thrushes. By Henry Seeboнm.
[Received Dccember 16, 1879.]
(Plate LXIV.)
In the year 1833 Tickell described (J. A. S. Beng. ii. p. 577) a Thrush from India under the name of Turdus unicolor. In 1837 Gould described the same species (P. Z. S. v. p. 136), and, curiously enough, gave it the same name. In 1842 Blyth, apparently thinking it impossible that an accidental coincidence of name could be accom-
${ }^{1}$ König-Warthausen, Jahresb. Ver. Naturk. Württ. 1875, p. 314.
panied by a real coincidence of species, proposed (J. A. S. Beng. xi. p. 460) the name of Turdus modestus as a substitute for Turdus unicolor, "Gould, nec Tickell"' apud Blyth. In 1847 Blyth discovered that he had fallen into precisely the same blunder that he had tried to correct in Gould; for the name T. modestus had already been applied by Eyton, in 1839 (P. Z. S. vii. p. 103), to a different species of Thrush. Blyth accordingly proceeded (J. A. S. Beng. xvi. p. 144) to give a third name, Geocichla dissimilis, to this species. In doing so, however, he further complicated the question by adding to his new name the description of the immature male or female of a new species which he erroneously imagined to be the adult male of T. unicolor, Gould.

In 1850 Bonaparte described what he considered to be a new species of Thrush from a skin in the Leyden Museum labelled "Central Asia." He gave it (Consp. Gen. Av. i. p. 273) the name of Turdus pelios, but afterwards, in 1854 (Compt. Rend. xxxviii. p. 5), carelessly identified an Abyssinian Thrush (Turdus icterorhynchus, Pr. Würt.) with his description of P. pelios, and needlessly threw doubt on the correctness of the Leyden locality. The skin in the Leyden Museum is undistinguishable from the female or immature male which Blyth described as T. dissimilis.

After a lapse of twelve years Jerdon, in his ' Birds of India,' further complicated matters by erroneously identifying T. dissimilis (Blyth) with T. cardis, Temm., including it in his work (i. p. 521) as Turdulus cardis (Temm.).

The following year Sclater described (Ibis, 1863, p. 196) a new species of Thrush from Amoy as Turdus hortulorum, the male (doubtless immature) and female of which are undistinguishable from T. dissimilis (Blyth).

Seven years later Cabanis received a Thrush from Dr. Dybowsky, collected in the ralley of the Amoor (likewise undistinguishable from T. dissimilis (Blyth), and identified it with T. pelios, Bonap., pointing out (Journ. Orn. 1870, p. 238) the error into which Bonaparte afterwards fell.

Further complications now followed thick and fast. In 1871 Hume described a new Thrush from Assam (Ibis, p. 411) as Geocichla tricolor. In 1873 Swinhoe described a new Thrush from Cheefoo (Ann. Nat. Hist. ser. 4, vol. xii. p. 374) as Turdus campbelli. In the following year, forgetting that he had described it in the 'Annals,' he redescribed the same skin in 'The Ibis' (1874, p. 444, pl. xiv.) as Turdus chrysopleurus.

My first attempt to unravel this complicated tangle of facts was to draw the inference that whereas in the nearly allied species T. cardis, Temm., T. obscurus, Gmel., T. pallidus, Ginel., and T. unicolor, Tick., the females and immature males have streaks or spots on the throat, which disappear in the fully adult male, it was lighly probable that the fully adult male of T. dissimilis, Blyth, would also have an unspotted throat. Having arrived at this conclusion, it was an easy step to identify T. campbelli, Swinh., or T. tricolor (Hume), as the fully adult male. Hume's description
was that of a somewhat darker bird than Swinhoe's type ; but finding in the Museum at Philadelphia a second skin agreeing precisely with the latter (obtained, I was informed, by the Perry Expedition to Japan), I cut the Gordian knot by assuming Swinhoe's bird to be the normal adult male and Hume's to be a partially melanistic form not uncommon among Thrushes. Since then the return of Mr. Wardlaw Ramsay from Afghanistan has placed the Tweeddale collection within reach; and I find in it the skin of a Thrush from Assam (which I propose to be figured as an illustration to this paper) which apparently agrees with Hume's description of G. tricolor ; and I also hear that Captain Elwes possesses two skins from the same locality. These facts have obliged me to alter my opinion as to the identity of the Indian with the Chinese specimen. I am now inclined to identify Hume's bird as the fully adult male of $T$. dissimilis (Blyth). Both Hume's type and the skins in the Tweeddale collection were shot in Assam; and in 'The Ibis' for 1872 (p. 136, pl. vii.) is an excellent figure of the immature male or female of T. dissimilis (Blyth), the original of which was shot by Colonel Godwin-Austen in the same locality. The two species will therefore stand as follows:-

## Turdus dissimilis (Blyth). (Plate LXIV.)

Geocichla dissimitis, Blyth, J. A. S. Beng. 1847, p. 144.
Turdulus cardis (Temm.), apud Jerdon, B. India, i. p. 521 (1862). Geocichla tricolor, Hume, Ibis, 1871, p. 411.
Adult male with the entire head, neck, and throat dark slate-grey, nearly black, shading into paler slate-grey on the rest of the upper parts. Axillaries, under wing-coverts, sides of the breast, and upper portion of the flanks brilliant orange-chestnut, shading into brown on the lower portion of the flanks, and into white on the centre of the breast, belly, and under tail-coverts.

Female and immature male. Upper parts differing from the adult male in being pale slate-grey suffused with russet-brown on the forehead, and with olive-brown on the centre of the back. Throat nearly white in the centre, the feathers on the sides of throat and chest having dark-hrown fan-shaped terminal spots. Rest of the plumage similar to that of the adult male.
Hab. Assam, occasionally straying westward as far as Calcutta.

## Turdus hortulorum, Sclater.

Turdus pelios, Bonap. Consp. Gen. Av. i. p. 273 (1850, nec plur. auct.)?.

Turdus hortulorum, Sclater, Ibis, 1863, p. 196.
Turdus campbelli, Swinhoe, Ann. Nat. Hist. 1873, xii. p. 374.
Turdus chrysopleurus, Swinhoe, Ibis, 1874, p. 444.
Until a fully adult male has been obtained from Southern Siberia, we can never be absolutely sure to which of the two species Bonaparte's name properly belongs; but the bird from the Amoor is more likely to be identical with one from China than with one from Assam. According to the new-fashioned system adopted by the
extreme Ritualist party in ornithology, who attempt to carry out the Stricklandian code regardless of consequences, Bonaparte's name would hang in terrorem over Sclater's, to be substituted for it as soon as it could be proved that it certainly referred to the same species; or, following the practice of the blindest followers of this unfortunate innovation, Bonaparte's name would at once be given the benefit of the doubt, regardless of the fact that it had been extensively applied to a different species. I cannot for a moment lend myself to such ornithological immorality, and must look upon Bonaparte's name as one tainted for ever, and debarred for the future from being used for any species of Thrush.

In the fully adult male of $T$. hortulorum, Sclater, the general colour of the upper parts is a dull slate-grey, shading on the sides of the neck into a very pale slate-grey on the throat and chest. The axillaries, under wing-coverts, and flanks are brilliant orange-chestnut, shading into white on the centre of the belly and under tailcoverts.

The female and immature male are undistinguishable from those of $T$. dissimilis (Blyth).
7. On the Mollusca of H.M.S. 'Challenger' Expedition.The Cectide, comprising the genera Parastrophia, Watsonia, and Cacum. By the Marquis de Folin. With a Prefatory Note by the Rev. Robert Boog Watson, B.A., F.R.S.E., F.L.S., \&c. (Published by permission of the Lords Commissioners of the Treasury.)
[Received November 25, 1879.]
[The Cæcidæ are a group of shallow-water Mollusca, enormously numerous in individuals but hitherto poor in species. As was natural, very few indeed presented themselves in the 'Challenger' dredgings; and these I had great pleasure in intrusting to one who has so specially made the group his study as the Marquis de Folin. His acquaintance with the subject in general, and his own vast collection of specimens gathered from every quarter of the globe, are the pledges that in what he has now produced nothing known on the subject has been overlooked; and even those who may hesitate to accept in full his classification will recognize both the general value of this monograph, and the extraordinary perfection with which he has delineated the specimens.

Robert Boog Watson.]

## 1. Parastrophia challengeri, n. sp.

St. 186. Sept. 8, 1874. Lat. $10^{\circ} 30^{\prime}$ S., long. $142^{\circ} 18^{\prime} \mathrm{E}$. Wednesday Island, Cape York. 8 fms . Coral-sand. Temperature of sea at the surface $77^{\circ} \cdot 2 \mathrm{~F}$. One specimen.

Testa minuta, tubularis, tricurvata, subopaca, alba, nitida, minu-
tissime et irregulariter transversim striata; apicem versus paululo tumidula. Apertura obliqua, hand marginata.
Length 2.3 mm . Breadth 0.2 mm .
The apex of this specimen has been broken and restored; so that its original form is somewhat obliterated. The species presents the usual slight swelling at the beginning of the curve, a little way from the apex. It has three curvatures. The aperture is oblique. From $\boldsymbol{P}$. asturiana (see 'Les Folds de la Mer,' vol. i. pp. 174 and 218, pl. xxix. fig. 7) it differs in that the shell here is shorter, the curves stronger, while the annular striations are much finer and are differently arranged. Its form distinguishes it from $P$. cornucopia e ('Les Fond,' \&c. vol. i. pp. 122, 174, 218 . pl. xv. figs. 7-9). The absence of the characteristic apex is a feature noticeable here, as well as in some specimens of $\boldsymbol{P}$. asturiana which yet present all the other characteristics of the genus. In a shell so sharp at the point a fractured apex is not wonderful ; it doubtless occurs through accident; and the injury is repaired, and the traces of it concealed, by deposition of shelly matter.
2. Strebloceras subannulatum, n. sp.

July 1875. Reefs off Honolulu. 40 fms. Three specimens.
Testa minuta, bicurvata, vitrea, diaphana, nitida; nucleo spirali, obliquo; anfractibus duobus; posted testa tubularia, latitudine accrescens, curvam duplicem sequens, transversim subannulata, annuli latis, minutissime expressis, subacutis, late separatis. Apertura obliqua.
Length 3 mm . Breadth 0.5 mm .
These three specimens are the first living representatives of the genus; and that they really belong to it is obvious, since the nucleus exhibits two or two and a half whorls and is placed at the side, not in the central plane of the shell-the position occupied by the nucleus in Cecum with as many whorls, and in Parastrophia with only half a whorl; and this is a distinction of great importance. Below the nucleus the shell increases steadily in breadth, and as it lengthens takes a curve in two planes. The shell is vitreous, translucent, glossy, and thin, ornamented by broad, remote, transverse slightly sharp undulations, which can hardly be reckoned rings, being so faint as only to be visible under the microscope. This ornamentation, slight as it is, is very characteristic. The mouth is oblique, with the obliquity turned towards the plane of the apex of the nucleus. This is a feature of some importance in the family of Cæcidæ, the direction of the oblique mouth being constant in the well-known genera Cecum and Meioceras; and the same may be affirmed of Pärastrophia.

## Watsonia, nov. gen.

Testa probabiliter primum nucleosa, postea tubularia, decollata, via bicurvata, conica; apertura orbicularis, valde obliqua, valide circumdata.
The three specimens here under consideration have all the Proc. Zool. Soc.-1879, No. LII.
appearances of belonging to the family of the Cæcidæ. Their form is very peculiar: obviously they have lost the embryonic shell, and the opening thus made has been closed by a septum; but, unlike the case in Cacum, only a single decollation has taken place here, leaving the shell acutely conical. On this feature the new genus is founded, which I have dedicated to the Reverend Robert Boog Watson.

## 3. Watsonia elegans, n. sp.

St. 186. Sept. 8, 1874 . Lat. $10^{\circ} 30^{\prime}$ S., long. $142^{\circ} 18^{\prime}$ E., Wednesday Island, Cape York. 8 fms. Coral-sand. Surface temperature $77^{\circ} \cdot 2 \mathrm{~F}$. Three specimens.

Testa adulta, tubularis, conica, leviter biarcuata, subflava, nitida, annulis regularibus, rotundatis, valde obliquis, minimis, paulo expressis, crebris, elegantissime cincta; apertura valde obliqua, annulo lato crasso valde prominente circumdata.
Length 2.5 mm . Breadth 0.5 mm .
This very remarkable and elegant form is extremely conical. It starts with a rather regular curve, and towards the mouth bends suddenly in the same direction as the very oblique aperture. It is yellowish glossy and very beautifully ornamented with numerous small, transverse, oblique rings slightly expressed, but well rounded, and though close-set yet well defined. The very oblique mouth is strengthened by a large and very prominent ring, which indicates the adult condition of the shell. This fact of the shells being full-grown implies that no further decollation was to take place, while the fineness of the pointed apex indicates that only one has occurred already. The septum of the apex is smooth, with a minute, scarce visible mamillation in one specimen, which is even less marked on the second. The third is broken.

All appearances point to the Cæcidæ as the true position of this beautiful and interesting little shell; but even should this prove a mistake, it will still constitute in any case a remarkable genus.

## 4. Cefcum lineicinctum, n. sp.

St. 24. March 25, 1873. Lat. $18^{\circ} 38^{\prime} 30^{\prime \prime}$ N., long. $65^{\circ} 5^{\prime} 30^{\prime \prime}$ W. Off Culebra Island, St. Thomas, Danish West Indies. 390 fms. Coral-mud. One specimen.

> Testa subcylindrica, parum arcuata, albida, subopaca, sublavis, nitida, aperturam versus lineis transversis cincta. Apertura? Septo mucronato, leviter circumdato.

Length 2.5 mm . Breadth 0.7 mm .
The solitary specimen of this species is in bad condition; but the shell is obviously glossy, nearly opaque, whitish and almost smooth, with a few stroug transverse lines like minute rings towards the mouth, which is broken. The mucronated septum has possibly been much larger; for it seems eroded. Like all dacifyliform septa it is surrounded by a portion of the tube which projects so as to protect it. It is the first smooth or nearly smooth Cecum I have
seen with a septum of this character ；and，misled by this feature，I at first considered it to be a specimen of C．reversum，Carp．；but that species belongs to his group Fartulum，with which the specimen in hand has nothing to do．I believe it to be a new species．

5．Cecum attenuatum， n ．sp．
Sept．8，1874．Flinders Passage，Cape York． 7 fms．Nine specimens．

Testa，quod genus，mediocris，conica，arcuata，elongata，alba，parum nitida，subopaca，annulis numerosis crebris，hand sew vic expres－ sis，cincta，aperturam versus paululo latior vel dilatata．Asper－ tara vic obliqua，hand marginata，arum contracta，septo valido mamillato－ungulato，margine laterali bicurvato，dorsali gibboso．
Length 1.8 mm ．Breadth 0.4 mm ．
A very curious species，very small，conical，curved，long in pro－ portion to its breadth，slightly glossy，opaque．It looks smooth；but under a lens it appears ornamented with numerous close－set，scarcely projecting rings．Towards the mouth the shell broadens a little and then contracts，thus forming a peristome which is slightly oblique and has no ledge．The septum is enormous，and in form is at once mamillated and ungulated．Its dorsal protuberance or hump，when looked at from behind，rises in an equable curve from either side．

6．Cecum sepimentum，de Foin．
July 1875．Reefs off Honolulu， 40 fathoms．Many specimens．
Var．arcuate，de Foin．
St．172．July 22，1874．Lat． $20^{\circ} 58^{\prime}$ S．，long． $175^{\circ} 9^{\prime}$ E． Tongatabu． 18 fms．Coral．Surf．temp． $75^{\circ}$ F．One specimen． Sept．28，1875．Tahiti Harbour． 20 fms ．Two specimens．
De Foin，Les fords de la mere，vol．i．p．84，pl．vi．fig． 7.
A species described from specimens dredged at Mauritius．The numerous specimens from Honolulu are quite of the typical form．The var．arcuate is shorter and more bent．The specimen from Tonga－ tabu is somewhat broader and has thicker rings than those from Tahiti．

## 7．Cecum，n．sp．

July 1875．Reefs off Honolulu． 40 fms．One broken specimen．
Probably a third of the shell is broken away．It is ornamented with strong and pretty regular rounded transverse rings，which are parted by hollows equally broad and rounded with the rings．The septum is regularly and hemispherically mamillated with a coarsely tubercled surface．It seems to be a new species．

8．Cecum chinese，de Foin．
St．186．Sept．8， 1874 ．Lat． $10^{\circ} 30^{\prime}$ S．，long． $142^{\circ} 18^{\prime}$ E．Wed－ nesday Island，Cape York． 8 fms．Coral－sand．Surf．temp． $77^{\circ} \cdot 2$ F．Two specimens．

De Foin，＇Les Fords de la Mr，＇vol．i．p．80，pl．ix．figs．3， 4.

Compared with the original types, the 'Challenger' specimens have the transverse striations stronger, more regular, and more prominent, but they certainly belong to this species.
9. Cecừm subflayum, n. sp.

St. 186. Sept. 8, 1874. Flinders Passage, Cape York. 7 fms. One specimen.

Testa minuta, subcylindrica, paulo arcuata, primum albida, dein subflava, nitida, strigis irregularibus plus minusve expressis, transversim cincta, aperturam versus tumida; inflatio rotundata, transversim sulcata. Apertura leviter obliqua, tumore circumdata; septo haud elevato, bimamillato, seu mamillatoungulato; margine laterali undulato, paululo convexo, fere plano decollationis parallelo.
Length of entire shell 2.5 mm ., length of the adult part 1.8 mm . Breadth 0.4 mm .

In this specimen the adolescent shell is still united to the fullgrown adult, whose septum can be recognized within, through the thin walls of the younger shell. A slight contraction of the tube indicates the place where decollation was about to take place. Such specimens are occasionally to be met with, and are very interesting.

The species belongs to the pretty numerous group of smooth Caca, all more or less nearly connected.
Among these may be mentioned in particular C. auriculatum, C. bimamillatum, C. circumvolutum, C. massiliense, C. modestum, C. strigosum (see 'Les Fonds de la Mer'); but from them all this species differs in the mouth or in the septum.

In colour it is whitish near the apex and slightly yellowish towards the mouth. It is strongly but irregularly striated transversely. Near the mouth, which is little oblique, there is a rounded transversely furrowed varix bevelled off to a thin inner edge. The septum is bimamillated, having a slightly larger and higher swelling on the side which lies near the concave curve of the shell.

## 10. Cefcum succineum, n . sp ,

St. 186. Sept. 8, 1874. Flinders Passage, Cape York. 7 fms. Nine specimens.

Testa minuta, subcylindrica, parum elongata, arcuata, flava vel albida, subopaca, nitidissima, lavis sed subannulata, aperturam versus dilatata, annulo lato, rotundato, prominente terminata. Apertura paululo obliqua, haud contracta, septo subplanato, parum expresso, vix conspicuo.
Length 1.9 mm . to 2 mm . Breadth 0.4 mm .
This species is nearly cylindrical, a good deal curved, rather long, amber-coloured or whitish or yellowish, very glossy, nearly opaque. In some lights it looks as if girt by a series of very small rings; but there is no real swelling nor grooving, and the appearance of rings is probably only some effect of reflection in connexion with the texture of the shell. There is a broad and high ring round the mouth.

The septum is nearly flat，and projects so slightly as to be barely visible from the side．

This species may possibly be only a variety of $C$ ．subflavum；but the difference in the septum seems to individualize it．

11．Cecum microcyclos，n．sp．
St．186．Sept．8， 187 4．Flinders Passage，Cape York． 7 fms． Fourteen specimens．

Testa subconica，elongata，arcuata，favescens，nitidissima，sub－ opaca，annulis multis parum expressis cincta，aperturum versus paulo dilatata．Apertura hand obliqua，nee contracta，hand marginata；septo subangulato，submucronato，uliquando bimu－ cronato．
Length 2 mm ．Breadth 0.3 mm ．
This beautiful species is long in proportion to its breadth；it is conical，rather bent，yellowish，very glossy and nearly opaque．The sculpture consists of numerous small rings，very close－set and slightly prominent．It is sometimes as smooth as C．succineurm，from which it differs in its greater length，its more conical form，and the shape of its septum．The mouth is normal in its relation to the axis；it has no marginal ring；and the shell expands towards it regularly without any contraction．The septum is somewhat pointedly subangulated，presenting occasionally two or three very similar pro－ tuberances．

## 12．Cecum flegantissimum，Carp．

Feb．10，1873．Off Tenerife． 70 fms．Six specimens．
These specimens present slight differences，but belong unques－ tionably to this somewhat variable species．

## 13．Cecum regulate，Carp．

St．122．Sept．10，1873．Lat． $9^{\circ} 5^{\prime}$ S．，long． $34^{\circ} 50^{\prime}$ W．Off Pernambuco． 350 fms ．Mud．One specimen．

This specimen differs a little from Carpenter＇s description of $C$ ． regulare，but not enough to justify its erection into a separate species．

St．172．July 22，1874．Lat． $20^{\circ} 58^{\prime}$ S．，long． $175^{\circ} 9^{\prime} \mathrm{W}$ ． Tongatabu． 18 fms ．Coral．One specimen．

Testa minima，paululo subconica，arcuata，vitrea，diaphana，tenuis， nitida，primum annulata，dein transversim strata，annulis minimis vic expressis，aperturam versus paululo infata．Aper－ tara parum contracta，vix obliqua，marginata，septo vix elevato，submamillato，apiece in medio ito．
Length 1.5 mm ．Breadth 0.3 mm ．
This pretty little species is somewhat broken at the mouth，but is otherwise perfect．It is slightly conical，crystalline，translucent， glossy and very thin．On the upper part there are rings，which though scarcely expressed are quite distinct under a magnifying
glass. At about one third from the apex they are replaced by irregularly disposed striations. Towards the mouth the shell is slightly dilated; but just at the edge it is faintly constricted and then even more faintly reflected. The septum is minute and very slightly elevated in the form of a centrally mamillated button.

The species differs from C.bipartitum ('Les Fonds de la Mer,' vol. i. p. 185, pl. xxv. figs. 9, 10) from Mexico, in size, thinness of shell, form of mouth and septum, and in sculpture. From C. semicinctum (Les Meleaginicoles, p. 42 ; Les Fonds de la Mer, p. 8) it differs in size, thinness, arrangement and form of the rings, and in the form of its septum.

## 15. Cecum crystallinum, n. sp.

July, 1875. Reefs off Honolulu. 40 fms. One specimen. Length? Breadth 0.3 mm .
An imperfect specimen, the upper part being broken off. It is evidently a new species, though nearly related to C. striatum (Fonds de la Mer, vol. i. pp. 49, 170, pl. v. fig. 3), from which it differs in that the shell towards the mouth expands and is thereafter contracted so as to form a minute gorge, with a slightly reflected lip. At first sight it resembles C. glabriforme, Carp. (Brochina); but it is straighter, and the texture of the shell is different, exhibiting under the microscope fine longitudinal striations. Though unable, from its imperfect condition, to offer a full description, the specimen is so clearly a new species that I venture to attach to it the name I have given above.

## APPENDIX.

## LIST OF ADDITIONS TO THE SOCIETY'S MENAGERIE

## DURING THE YEAR

$$
1879 .
$$

Jan. 1. 2 Califormian Quails (Callipepla californica), ot and 9 . Presented by Mr. W. Turquand.
6. 1 Bar-winged Rail (Rallina pociloptera). Purchased. See P.Z.S. 1879, p. 108.
7. 1 Great Eagle-Owl (Bubo maximus). Deposited.
9. I Macaque Monkey (Macacus cynomolgus), ㅇ. Presented by Mr. W. Trent.
10. 1 Green Monkey (Cercopithecus callitrichus), $q$. Presented by Mr. Carroll.
1 Common Marmoset (Hapale jacchus). Presented by Mrs. Currey.
12. 1 Triangular Spotted Dove (Columba guinea). Presented by Col. F. C. Hassard, C.B.
13. 2 Cuming's Octodons (Octodon cumingi). Born in the Menagerie.
14. 1 Macaque Monkey (Macacus cynomolgus). 오. Presented by D'Orpen, Esq.
15. 1 Black-faced Spider Monkey (Ateles ater). Presented by the Earl Brownlow, F.Z.S.
1 Common Seal (Phoca vitulina). Presented by the Earl of Hopetoun.
16. 1 Dufresne's Amazon (Chrysotis dufresniana). Presented by Mrs. T. Smith.
1 Yellow-fronted Amazon (Chrysotis ochrocephala), Presented by Mrs. T. Smith.
1 Tuberculated Lizard (Iguana tuberculata). Presented by Dr. A. Stradling.

3 Merrem's Snakes (Liophis merremı). Purchased.
1 Darwin's Amphisbæna (Amphisbrena darwini). Purchased. See P. Z. S. 1879, p. 146.
1 Superb Tanager (Calliste fastuosa). Purchased.
1 Blue Creeper (Coreba cyanea). Purchased.
17. INoddy Tern (Anous stolidus). Presented by Morris H. Smyth, Esq., R.N. From Ascension.
21. 2 Cuming's Octodons (Octodon cumingi). Deposited.
23. 1 Entellus Monkey (Semnopithecus entellus). Presented by J. Mills, Esq., R.H.A.
2 Prairie-Marmots (Cynomys ludovicianus), $\delta$ and ㅇ. Presented by Miss Agneta B. Dykes.
4 Common Gulls (Larus canus). Presented by F. Cresswell, Esq.

Jan. 23. 1 Common Wigeon (Mareca penelope), 오. Presented by F. Cresswell, Esq.
4 Grey Plovers (Squatarola helvetica). Presented by F. Cresswell, Esq.
3 Knots (Tringa camatus). Presented by F. Cresswell, Esq.
1 Dunlin (Tringa cinclus). Presented by F. Cresswell, Esq.
24. 2 Coypu Rats (Dyyopotamus coypus). Purchased. From Buenos Ayres.
1 Brown Coati (Nasua nasica). Purchased. From Buenos Ayres.
2 Violaceous Night-Herons (Nycticorax violaceus). Purchased. From Bahia.
1 Great Frigate-bird (Fregata aquita). Pürchased. From Pernambuco.
1 Chilian Sea-Eagle (Geranooëtus melanoleucus). Purchased. From Buenos Ayres.
1 Diuca Finch (Diuca grisea). Purchased. From Buenos Ayres.
1 Brazilian Blue Grosbeak (Guiraca cyanea). Purchased. From Mexico.
1 White-faced Tree-Duck (Dendrocygna viduata). Purchased. From Rio de Janeiro.
2 Saira Tanagers (Pyranga saira). Purchased. From Buenos Ayres.
2 Dark Green Maize-eaters (Pseudoleistes virescens). Purchased. From Buenos Ayres.
1 White-bellied Thrush (Turdus albitentris). Purchased. From Bahia.
2 Pileated Jays (Cyanocorax pileatus). Purchased. From Buenos Ayres.
1 Ariel Toucan (Ramphastos ariel). Purchased. From Bahia.
1 Blue-and-yellow Macaw (Ara ararauna). Presented by F. G. J. Lillingston, Esq., R.N.
27. 1 Macaque Monkey (Macacus cynomolyus), ot. Presented by E. E. Barclay, Esq.

1 Grey Ichneumon (Herpestes griseus). Presented by B. Baverstock, Esq.
2 Goldfinches (Carduelis elegans). Presented by H. A. Macpherson, Esq.
1 Giraffe (Camelopardus giraffa), or. Purchased. From Nubia. See P. Z. S. 1879, p. 108.
28. 1 Golden-naped Amazon (Chrysotis auripalliata). Presented by Mrs. H. A. Hopkins.
4 River Jack Vipers (Vipera rhinoceros). Received in exchange.
1 Golden-fronted Parrakeet (Brotogerys tuipara). Received in exchange.
1 American Tantalus (Tantalus loculator). Received in exchange.
1 Rough Terrapin (Clemmys punctularia). Received in exchange.
2 Northern Buzzards (Buteo borealis). Received in exchange.
29. 1 Weeper Capuchin (Cebus capucinus). Presented by W. Fridrick, Esq.
30. 3 Canada Geese (Bernicla canadensis). Presented by W. Bonorton, Esq.
1 Macaque Monkey (Macacus cynomolgus), 오. Presented by Mrs. Eardley Holt.
31. 2 White-throated Capuchins (Cebus hypoleucus). Presented by Jas. Backhouse, Esq.

Feb.1. 1 Short-tailed Wallaby (Halmaturus brachyurus). Presented by G. Bowen, Esq.
1 Black-winged Peafowl (Pavo nigripennis). Presented by the Hon. A. S. G. Canning.
2. 1 Common Gannet (Sula bassana). Presented by Edgar T. Adams, Esq.
3. 1 Geoftroy's Dove (Peristera geoffroii). Bred in the Gardens.
4. 1 Purple-crested Touracou (Corythaix porphyreolopha). Presented by the Rev. J. A. Gould, F.Z.S. See P. Z.S. 1879, p. 218.
5. 2 Slender Loris (Loris gracilis). Presented by Leith Bonhôte, Esq.
7. 1 Common Rhea (Rhea americana). Presented by Major Venables.
10. 2 Yellow-billed Sheathbills (Chionis alba). Purchased.
11. 1 Ring-tailed Lemur (Lemur catta), ㅇ. Presented by Thos. G. Mann, Esq.
12. 1 Cape-Hyrax (Hyrax capensis). Presented by Mr. A. H. Jamrach.
1 Yellow-footed Rock-Kangaroo (Petrogale xanthopus). Born in the Menagerie.
1 Garnett's Galago (Galago garnetti). Purchased.
13. 1 Wood-Owl (Syrnium alleco). Presented by Mrs. George Blagden.
14. 1 Common Gull (Larus canus). Presented by Harry W. Preston, Esq.
2 Black-headed Gulls (Larus ridibundus). Presented by Harry W. Preston, Esq.
17. 2 Indian Barred Doves (Geopelia striata). Presented by Capt.
H. Braddick.

1 Chinese Turtle Dove (Turtur chinensis). Presented by Capt. H. Braddick.

1 Common Hare (Lepus europaus). Presented by Mr. Alfred Withers.
1 Tayra (Galictis barbatus). Purchased.
18. 2 Prairie-Marmots (Cynomystudovicianus). Received in exchange.

1 Wizlizenus's Lizard (Crotaphytus wislizeni'). Presented by Lieut.-Col. Ralph Vivian, F.Z.S. See P. Z. S. 1879, p. 218.
19. 2 Cardinal Grosbeaks (Cardinalis virginianus). Purchased. 3 Australian Wild Ducks (Anas superciliosa). Purchased.
3 Golden Tree-Frogs (Hyla aurea). Purchased.
2 White's Tree-Frogs (Pelodryas cervlea). Purchased.
1 Blue-cheeked Amazon (Chrysotis coeligena). Purchased. See P. Z. S. Feb. 17, 1880.
20. 1 Spotted Eagle Owl (Bubo maculosus). Purchased.

1 Many-zoned Hawk (Melierax polyzmus). Purchased.
21. 1 Green Monkey (Cercopithecus callitrichus). Presented by J. Douglas Murray, Esq.
1 Bennett's Wallaby (Halmaturus bemettii). Presented by W. E. Windus, Esq.

1 Russian Bullifinch (Pyrrhula rubicilla). Purchased.
22. 2 Grand Galagos (Galago crassicaudatus). Purchased.
25. 1 Impeyan Pheasant (Lophophorus impeyanus), ㅇ. Received in exchange.
2 Cheer Pheasants (Phasianus wallichiv), of ㅇ. Received in exchange.
1 Common Nuthatch (Sitta cesia). Purchased.

Feb. 27. 1 Sambur Deer (Cervus aristotelis), $\delta^{\circ}$. Born in the Menagerie.

## Mar. 1. 1 Common Hare (Lepus europaus). Presented by Mrs. F. Buckiand.

3. I Syrian Bear (Ursus syriacus). Presented by Dr. J. Huntley, C.M.Z.S., Bushire, Persian Gulf.
4. 1 Green Monkey (Cercopithecus callitrichus). Presented by Miss E. A. B. Payton.
5. 3 Japanese Deer (Cerves sika), ơ, ㅇ, 오. Presented by the Viscount Powerscourt, F.Z.S.
2 Lanceolated Jays (Garruhes lanceolatus). Purchased.
2 Chilian Skunks (Conepatus mapurito). Deposited.
6. 1 Pig-tailed Monkey (Macacus nemestrinus), \&. Presented by Mirs. J. E. Fenton.
1 Coati (Nasua rufa). Purchased.
2 Acouchys (Dasyprocta acouchy). Purchased.
7. 2 Mountain-Finches (Fringilla montifringilla). Purchased.
8. 1 Indian Fruit-Bat (Pteropus medius). Presented by Capt. F. P. Millett.

3 Common Badgers (Meles taxus). Born in the Menagerie.
11. 1 Brant Goose (Bernicla brenta). Presented by H. A. Dombrain, Esq.
12. 1 Nitred Monkey (Semnopithecus mitratus). Received in exchange.
1 Black-faced Spider Monkey (Ateles ater). Received in exchange.
1 Black-handed Spider Monkey (Ateles geoffroyi). Received in exchange.
1 Mule Deer (Cervus macrotis), ठ'. Presented by Judge Caton. See P. Z. S. 1879, p. 308.
14. 2 Gaimard's Rat Kangaroos (Hypsiprymmus gaimardi), ơ, 오. Presented by Ernest E. Harrold, Esq.
16. 1 Spotted Ichneumon (Herpestes auropunctatus). Presented by Miss H. Boteler.
1 Black-necked Stilt Plover (Himantopus nigricollis). Purchased.
17. 1 Tabuan Parrakeet (Pyrrhulopsis tabuensis). Deposited.

1 Stair's Dove (Phlogocnas stairi). Purchased.
18. 1 Bonnet-Monkey (Macacus radiatus), 才'. Presented by George Eggar, Esq.
1 Chinchilla (Chinchilla lanigera). Presented by Sir Charles Smith.
20. 1 Sumatran Rhinoceros (Rhinoceros sumatrensis). Deposited. See P.Z. S. 1879, p. 308.
1 Greater Spotted Woodpecker (Picus major). Presented by H. Laver, Esq.
22. 1 Mona Monkey (Cercopithecus mona), 오. Presented by Miss Sandford.
1 Pied Wagtail (Motacilla yarrelli). Purchased.
1 Reed-Bunting (Emberiza schœeniclus). Purchased.
25. 1 Cape Ant-Bear (Orycteropus capensis). Purchased.

5 European Geckoes (Phyllodactylus europaus). Presented by Dr. H. H. Gighioli, C.M.Z.S.
27. 1 Grey-breasted Parrot (Bolborhynchus monachus). Presented by Miss Hilhouse.
28. I Green Monkey (Cercopithecus callitrichus), ठ". Presented by J. N. Tiedeman Marthege, Esq.

Mar. 28. 1 Globose Curassow (Crax globicera), ㅇ. Presented by the Rev. Ralph Cooper.
1 Common Peafowl (Pavo cristatus), で. Presented by T. B. Hopkinson, Esq.
29. 1 Peba Armadillo (Tatusia peba). Purchased.

1 Long-haired Armadillo (Dasypus vellerosus). Purchased.
1 Brazilian Hare (Lepus brasiliensis). Purchased.
30. 1 Laughing Kingfisher (Dacelo gigantea). Presented by F. Belcher, Esq.
31. I Reed-Bunting (Emberiza schoniclus). Purchased.

8 Indian Jerboa Rats (Gerbillus indicus). Purchased.
2 New-Zealand Parakeets (Cyanorhampus nove zealandic). Purchased.

April 1. 1 Black-backed Jackal (Canis mesomelas). Presented by E. J. Redman, Esq.
1 Red-and-yellow Macaw (Ara chloroptera). Presented by Mrs. Kelly.
2 Yellow-fronted Amazons (Chrysotis ochrocephala). Presented by Mrs. Kelly.
2 Silver Pheasants (Euplocamus nyctemerus), ơ, ㅇ. Presented by W. Soper, Esq.
2 Lanceolated Jays (Garrulus lanceolatus). Received in exchange. See P.Z.S. 1879, p. 384.
2. 1 Tuberculated Lizard (Iguana tuberculata). Presented by Dr. J. F. Chittenden, C.M.Z.S. From Trinidad.
1 Broad-snouted Cayman (Alligator latiostris). Presented by Dr. A. Stradling.
2 Common Boas (Boa constrictor). Deposited.
1 Chequered Elaps (Elaps lemniscatus). Deposited.
1 Anaconda (Eunectes murinus). Received in exchange.
3. 2 White-rumped Roe Deer (Capreolus pygargus). Received in exchange. See P. Z. S. 1879, p. 384.
1 Chinese Water-Deer (Hydropotes inermis). Received in exchange.
1 Greater Sulphur-crested Cockatoo (Cacatua galerita). Deposited.
2 Nississippi Alligators (Alligator mississippiensis). Presented by Lord Francis Conyngham, M.P., F.Z.S.
4. 4 Canada Geese (Berricla canadensis). Presented by R. J. Balston, Esq., F.Z.S.
2 Bernicle Geese (Bernicla leucopsis). Presented by R. J. Balston, Esq., F.Z.S.
2 Brant Geese (Bernicla brenta). Presented by R. J. Balston, Esq., F. Z. S.
1 Wild Goose (Anser ferus). Presented by R. J. Balston, Esq., F.Z.S.

1 Bean-Goose (Anser segetum). Presented by R. J. Balston, Esq., F. Z. S.
2 Common Geese (Anser domesticus), ot, ㅇ. Presented by R. J. Balston, Esq., F.Z.S.

3 Common Ducks (Anas boschas), 2 or and 1 우. Presented by R. J. Balston, Esq., F. Z. S.

3 Australian Wild Ducks (Anus superciliosa). Presented by R. J. Balston, Esq., F. Z. S.

2 Ruddy Sheldrakes (Tadorna rutila), $\sigma^{*}$ and $\circ$. Presented by R. J. Balstan, Esq., F. Z. S.

April 4. 2 Common Pintails (Dafla acuta), of and ㅇ. Presented by R. J. Balston, Esq., F. Z. S.

2 Gadwalls (Anas strepera), $\delta$ and 9 . Presented by R. J. Balston, Esq., F. Z.S.
4 Chiloe Wigeon (Mareca chiloensis), 20 and 2 오. Presented by R. J. Balston, Esq., F. Z. S.
2 Mandarin Ducks (Aix galericulata), $\delta^{*}$ and 오. Presented by R. J. Balston, Esq., F. Z. S.

1 Summer Duck (Aix sponsa), ơ. Presented by R. J. Balston, Esq., F.Z.S.
2 Common Teal (Querquedula crecca), $\delta$ and 오. Presented by R. J. Balston, Esq., F. Z. S.

2 Garganey Teal (Querquedula circia), ot and 우. Presented by R. J. Balston, Esq., F. Z. S.
2 Chilian Pintails (Dafila spinicauda), ס and 우. Presented by R. J. Balston, Esq., F.Z.S.

2 Common Wigeon (Mareca penelope), of and ㅇ. Presented by R. J. Balston, Esq., F. Z. S.
5. 1 Neck-marked Snake (Geoptyas collaris). Purchased.
6. 1 Rude Fox (Canis rudis). From Demerara. Deposited.
8. 1 Rhesus Monkey (Macacus erythreus). Presented by Mr. J. Roberts.
1 Grivet Monkey (Cercopithecus griseo-viridis). Presented by W. B. Greenfield, Esq.

1 Common Seal (Phoca ritulina). Presented by Capt. Charles Rawle.
1 Red-throated Diver (Colymbus septentrionalis). Presented by J. S. Thompson, Esq.
10. 1 Yak (Bison grunniens), ס7. From Bhootan. Presented by the Hon. Sir Ashley Eden, K.C.S.I.
1 Long-tailed Marmot (Arctomys caudatus). Presented by the Hon. Sir Ashley Eden, K.C.S.I.
1 Masked Parrakeet (Pyrrhulopsis personata). Purchased.
12. 1 Entellus Monkey (Semnopithecus entellus), ㅇ. Received in exchange.
1 Japanese Goat Antelope (Capricornus crispus). Presented by Harry Pryer, Esq., C.M.Z.S. See P. Z. S. 1879, p. 384.
14. 1 Blue-faced Green Amazon (Chrysotis bouqueti). Presented by Neville Holland, Esq.
1 Yellow-fronted Amazon (Chrysotis ochrocephala). Presented by Neville Holland, Esq.
18. 3 Red Brockets (Cervus rufus), of and $\circ$ and young. Presented by W. H. Lacy, Esq.
1 Upland Goose (Bernicla magellmica), ס. Purchased.
19. 1 Black-faced Kangaroo (Mucropus melanops), ठ̃. Purchased.

1 Skate (Raia batis). Presented by Harold Russell, Esq.
20. 1 Reeves's Muntjac (Cervulus reevesi), \&. Born in the Menagerie.
21. 1 Puff-Adder (Vipera arietans). Purchased.
23. 3 Prairie-Marmots (Cynomys ludovicianus). Presented by W. G. Marshall, Esq.

1 Lineated Boodon (Boodon lineatus). Purchased.
1 Spotted Slowworm (Acontias meleagris). Purchased.
1 Crossed Snake (Psammophis crucifer). Purchased.
1 Coppery Snake (Rhinostoma cum $e u m$ ). Purchased.
24. 1 Black-handed Spider Monkey (Ateles geoffroyi), ठ". Presented by D. R. Comyn, Esq.

Apr. 24. 1 Three-toed Amphiuma (Amphiuma means). Presented by A. C. Cole, Esq

1 Long-eared Bat (Plecotus auritus). Presented by Mr. J. Ward.
25. I Podargus (Podargus cuvieri). Presented by R. S. C. Baber, Esq.
26. 1 Guilding's Amazon (Chrysotis guildingi). From St. Vincent, West Indies. Presented by G. Dundas, Esq.
28. 5 Water-Ouzels (Cinchus aquaticus). Presented by F. Swabey,
29. 1 Reeves's Muntjac (Cervulus reevesi), 9 . Born in the Gardens.
1 Silver Pheasant (Euplocamus nyctemerus), ó. Presented by Mrs. E. J. Beagle.
30. 1 Crab-eating Raccoon (Procyon cancrivorus), ㅇ. Presented by R. Bridgett, Esq.

1 Small Hill-Mynah (Gracula religiosa). Presented by J. W. Woodler, Esq.
1 Alpine Accentor (Accentor alpinus). In exchange. See P. Z. S. 1879 , p. 384.

May 1. 1 Leopard Tortoise (Testudo pardalis). Purchased.
1 Bonnet-Monkey (Macacus radiatus), ot. Presented by Mr. E, Brett.
1 Ocelot (Felis pardalis). Presented by B. H. Jones, Esq.
1 Anaconda (Eunectes murinus). Presented by G. H. Hawtayne, Esq., C.M.Z.S.
1 Common Teguexin (Teius teguexin). Purchased.
2. 1 Pig-tailed Monkey (Macacus nemestrinus), \&. Presented by E. M. Clissold, Esq.

1 Long-tailed Marmot (Arctomys caudatus). Presented by Capt. Greenstreet, R. E. From Bhotan.
1 Undulated Grass-Parrakeet (Melopsittacus undulatus), ס". Presented by Miss Balls.
1 Black-faced Spider Monkey (Ateles ater), ठ". Presented by Capt. H. King. From Carthagena.
2 Tovi Parrakeets (Brotogerys tovi). Presented by Capt. H King. From Porto Cabello.
2 Passerine Ground-Doves (Chamapelia passerina). Presented by Capt. H. King.
1 South-American Flamingo (Phcenicopterus ignipalliatus). Purchased.
1 White Ibis (Ibis alba). Purchased.
1 Scarlet Ibis (Ibis rubra). Purchased.
3 Red-billed Tree-Ducks (Dendrocygna autumnalis). Purchased.
3. 1 Tamandua Ant-eater (Tamandua tetradactyla). Purchased.

1 Great American Egret (Ardea egretta). Purchased.
1 Common Boa (Boa constrictor). Purchased.
4. 1 Madagascar Boa (Pelophilus madagascariensis). Presented by the Rev. Canon G. Ogilvy.
5. 1 Macaque Monkey (Macacus cynomolgus), ס'. Presented by C. A. Thomson, Esq.

1 Macaque Monkey (Macacus cynomolgus) 오. Presented by F. V. Goddard, Esq.
6. 1 Common Ocelot (Felis pardalis). Presented by P. Leckie, Esq.
1 Indian Kite (Milvus govinda). Presented by Capt. Murray.

May 6. 1 Common Chameleon (Chamcleon vulguris). Presented by G. A. Dodd, Esq.

12 Common Teal (Querquedula crecca), $60^{\circ}$ and 69 . Purchased.
12 Garganey Teal (Querquedula circia), 6 ot and 6 ㅇ. Purchased.
12 Red-headed Pochards (Fuligula ferina), 6 ot and 6 오. Purchased.
6 Tufted Ducks (Fuligula cristata), 3 ot and 3 아. Purchased.
4 Shovellers (Spatula clypeata), 2 on and 2 ㅇ. Purchased.
2 Common Pintails (Dafila acuta), $\delta^{7}$ and ㅇ. Purchased.
2 Common Wigeon (Mareca penelope), ${ }^{7}$ and 9. Purchased.
8. 2 Horned Parrakeets (Nymphicus cornutus). Purchased. From New Caledonia. See P.Z. S. 1879, p. 550, pl. xliv.
1 Diana Monkey (Cercopithecus diana), 아. Received in exchange.
1 Subcylindrical Hornbill (Buceros subcylindricus). Received in exchange. See P. Z. S. 1879, p. 550.
9. 6 Seven-banded Snakes (Tropidonotus leberis). Born in the Menagerie.
10. 1 Macaque Monkey (Macacus cynomolgus). Deposited.

1 Pio-tailed Monkey (Macacus nemestrinus), 우. Presented by Capt. A. W. Shean.
1 Hybrid Markhoor (Capra megaceros), $\boldsymbol{o t}^{\boldsymbol{T}}$. Born in the Menagerie.
5 Peacock Pheasants (Polyplectron chinquis), 3 of and 2 오. Purchased.
A collection of Young Common Eels (Anguilla vulgaris). Presented by F. Buckland, Esq., F.Z.S.
1 Herring-Gull (Larus argentatus). Presented by Miss J. Windsor.
12. 1 Rhesus Monkey (Macacus erythreus). Presented by H.Winsor, Esq.
13. 2 Geoffroy's Doves (Peristera geoffoii). Bred in the Gardens.
14. 1 Puma (Felis concolor), ठ". Purchased.

1 Vulpine Phalanger (Phalangista vulpina), ㅇ. Presented by A. Elder, Esq.

1 Ring-necked Parrakeet (Paleornis torquatus). Presented by F. S. Prince, Esq.

1 Guianan Tree-Partridge (Odontophorus guianensis). Presented by E. L. Marshall, Esq.
15. 1 Herring-Gull (Larus argentatus). Presented by C. H. C. de Loecker, Esq.
16. 1 Zebu (Bos indicus), ${ }^{\circ}$. Born in the Menagerie.

1 Rough Terrapin (Clemmys punctularia). Presented by Sur-geon-Major C. J. Weir.
1 Adorned Terrapin (Clemmys ornata). Presented by SurgeonMajor C. J. Weir.
1 Stair's Ground-Dore (Phlogcenas stairiz). Purchased.
17. 2 Squirrel Monkeys (Chrysothrix sciurea), ס". Purchased.

2 Plantain-Squirrels (Sciurus plantani), of and 오. Purchased.
1 Ariel Toucan (Ramphastos ariel). Purchased.
1 Blue Jay (Cyanocitta cristata). Purchased.
1 Sclater's Curassow (Crax sclaterr). Purchased.
1 Yellow-legged Herring-Gull (Larus leucophaus). Bred in the Gardens.
19. 2 Bactrian Camels (Camelus bactrianus), 우. Deposited.

1 Javan Fish-Owl (Ketupa javanensis). Purchased.

May 19. 2 Black-tailed Godwits (Limosa melanura). Purchased.
2 Black Swans (Cygnus atratus), ${ }^{\circ}$ and 9 . Received in exchange.
5 Prussian Carp (Carassius vulgaris). Presented by G. H. Jones, Esq., F.Z.S.
20. 1 Grey-cheeked Monkey (Cercocebus albigena), ㅇ. Presented by Robt. Surry, Esq.
1 Patagonian Sea-lion (Otariajubata). Presented by F. E. Cobb, Esq. From the Falkland Islands. See P. Z. S. 1879, p.551.
1 Ceram Lory (Lorins garrulus). Purchased.
21. 2 Chinchillas (Chinchilla lanigera). Born in the Menagerie.

1 Common Lobster (Astacus vulgaris). Presented by Mr. J.
22. 3 Abyssinian Guinea-fowls (Numida ptilorhyncha). Purchased.

1 Nicobar Pigeon (Caloenas nicobarica). Purchased.
2 Golden headed Conures (Comurus auricapillas). Purchased.
6 Javan Parrakeets (Palcornis javanicus). Purchased.
23. 1 Roseate Cockatoo (Cacatua roseicapilla). Presented by Mr. Head.
1 Blue-Winged Green Bulbul (Phyllornis hardwickii). Presented by Mr. A. Jamrach.
1 Black-necked Swan (Cygnus nigricollis). Bred in the Gardens.
2 Horned Lizards (Phrynosoma cornutum). Presented by E. Loder, Esq., F.Z.S.
24. 1 Red-faced Saki (Brachyurus rubicundus). Purchased. See P. Z. S. 1879, p. 551.

2 Green-necked Peafowls (Pavo spicifer). Purchased.
1 Cheetah (Felis jubata). Purchased.
12 Common Wigeon (Mareca penelope), 6 of and 6 ㅇ. Purchased.
25. 1 Victoria Crowned Pigeon (Goura victorice). Purchased.

1 Mace's Sea-Eagle (Halicëtus leucoryphus). Purchased.
4 Common Sheldrakes (Tadorna vulpanser), $2 \delta^{\pi}$ and 2 우. Purchased.
26. 1 Geoffroy's Dove (Peristera geoffioii). Bred in the Gardens.

1 Argus Pheasant (Argus gigantens), o'. Purchased.
1 Puff-Adder (Vipera arietans). Presented by Surgeon F. Speer.
2 Silky Marmosets (Midas rosalia). Presented by Mrs. Hector.
27. 1 Michie's Tufted Deer (Elaphodus michianus.) Deposited.

1 White-thighed Colobus (Colobus bicolor). Presented by Dr. W. H. Hart.
30. 1 Brown Hyæna (Hyana brunnea). Purchased.

1 Axis Deer (Cervus axis) $0^{\circ}$. Born in the Menagerie.
31. 1 Capybara (Hydrochocrus capybara). Presented by H. B.
Whitmarsh, Esq.

June 2. 1 Great Kangaroo (Macropus giganteus), $\begin{gathered}\text { ( } \\ \text { nagerie. . Born in the Me- }\end{gathered}$
1 Red Kangaroo (Macropus rufus), ${ }^{0}$. Born in the Menagerie.
1 Bennett's Wallaby (Halmaturus bennettii), ㅇ. Born in the Menagerie.
3. 1 Rhesus Monkey (Macacus erythreus). Presented by J. Beech,
Esq.

1 Eland (Oreas canna), of. Born in the Menagerie.
4. 1 Golden Eagle (Aquila chrysaëtos). Presented by The Earl of Dunmore, F.Z.S.
3 Crossbred Parakeets (between Euphema elegans ơ and E. pulchella, ) ). Bred in the Gardens.

June 4. 3 Egyptian Geese (Chenalopex agyptiaca). Bred in the Gardens.
5. 3 Green-necked Peafowls (Pavo spicifer). Dcposited by Col. C. P. Hildebrand.

2 Common Kingfishers (Alcedo ispida). Presented by W. W. Cobb, Esq.
1 Red-and-yellow Macaw (Ara chloroptera). Presented by Miss C. Cattlin.
3 Maned Geese (Bernicla jubata), $1 \delta^{*}$ and 2 오. Purchased.
4 Amherst Pheasants (Thaumalea amherstic). Bred in the Gardens.
7. 1 Common Seal (Phoca vitulina). Purchased.
8. 1 Canadian Beaver (Castor canadensis). Born in the Menagerie.
9. 2 Yellow-legged Herring-Gulls (Larus leucophæus). Bred in the Gardens.
2 Orinoco Geese (Chenalopex jubata). Purchased.
1 Green-winged Trumpeter (Psophia viridis). Purchased.
2 Black Hornbills (Buceros atratus). Purchased.
1 Back-marked Snake (Rhinechis scalaris). Purchased.
1 Common Crowned Pigeon (Goura coronata). Purchased.
3 White-bellied Shore-Larks (Eremophila chrysolema). Purchased.
6 Melodious Finches (Phonipara canora). Purchased.
10. 1 White-whiskered Paradoxure (Paradoxurus leucomystax). Presented by Mr. Carl Bock.
2 Undulated Giass-Parakeets (Melopsittacus undulutus). Purchased.
5 Climbing Fishes (Anabas scandens). Presented by Dr. G. E. Dobson, C.M.Z.S.
11. 1 Rhesus Monkey (Macacus erythrous), 오. Deposited.

2 Common Paradoxures (Paradoxurus typus). Presented by G. K. Loyd, Esq.

2 Geoffroy's Doves (Peristera geoffroii). Bred in the Gardens.
1 Common Magpie (Pica caudata). Presented by J. L. Baldwin, Esq., F.Z.S.
12. 1 Black Bear (Üsus americanus). Received in exchange.

1 Globose Curassow (Crax globicera). Purchased.
1 Red-and-yellow Macaw (Ara chloroptera). Purchased.
13. 1 Indian Antelope (Antilope cervicapra), 才'. Presented by Hon. A. Greville.
1 Laughing Kingfisher (Dacelo gigantea). Presented by Mr. E. Hawkins.

1 West-African Python (Python seha). Presented by G. H. Garrett, Esq.
14. 1 Tamandua Ant-eater (Tamandua tetradactyla). Purchased. From Pernambuco.
1 Brazilian Cariama (Cariuma cristata). Purchased.
1 Crested Screamer (Chauna chavaria). Purchased.
1 Great American Egret (Ardea egretta). Purchased.
1 Tuberculated Lizard (Iguana tuberculata). Presented by Dr. A. Stradling.

1 Taraguira Lizard (Taraguira smithi). Presented by Dr. A. Stradling. From Bahia.
1 Black-eared Marmoset (Hapale penicillata). Purchased.
1 Negro Tamarin (Midas ursulus). Purchased. From Para.
1 Sun-Bittern (Eurypyga helias). Purchased.
1 Spotted-billed Toucanet (Selenidera maculirostris). Purchased. From Rio de Janeiro. See P. Z. S. 1879, p. 663.

## June 14. 3 Violet Tanagers (Euphonia violacea). Purchased. <br> 2 Saffron Finches (Sycalis flaveola). Purchased. From Pornambuco.

1 Pileated Song-Sparrow (Zonotrichia pileata). Purchased. From Pernambuco.
1 Pileated Finch (Coryphosphingus pileatus). Purchased. From Pernambuco.
2 Bluish Finches (Spermophila ccerulescens). Purchased. From Pernambuco.
15. 2 Chiloe Wigeons (Mareca chiloensis). Bred in the Gardens.

1 Caspian Ouaran (Psammosaurus caspicus). Presented by Commander J. Pratt. From Persia.
1 Lacertine Snake (Colopeltis lacertina). Presented by Commander J. Pratt.
16. 1 Common Badger (Meles taxus). Presented by Mr. G. Smith.

20 Spotted Salamanders (Salamandra maculosa). Purchased.
17. 2 Egyptian Gazelles (Gazella dorcas). Presented by Commander J. Pratt.
1 Ring-necked Parrakeet (Palcoornis torquatus). Presented by E. F. Carey, Esq.

1 Beech-Marten (Martes foina). Purchased. From Russia.
1 Allied Goshawk (Astur approximans). Purchased.
1 Martinique Water-hen (Porphyrio martinicus). Purchased.
4 Australian Wild Ducks (Anas superciliosa). Presented by Messrs. A. H. Jamrach and C. Rice.
18. 1 Greater Sulphur-crested Cockatoo (Cacatua galerita). Presented by J. W. Taylor, Esq.
1 American Robin (Turdus migratorius). Deposited.
2 Pied Wagtails (Motacilla yarrellii), o and 우. Presented by A. F. Wiener, Esq., F.Z.S.
1 Wiener's Finch (Pytelia wieneri). Presented by A. F. Wiener, Esq., F.Z.S.
11 Spotted Salamanders (Salamandra maculosa). Purchased.
19. 1 Brazilian Tanager (Ramphocclus brasilius). Purchased.

1 Slender-billed Cockatoo (Licmetis tenuirostris). Presented by George Wood, Esq.
1 Macaque Monkey (Macacus cynomolgus), đ. Presented by Mr. G. T. Close. From Chittagong.
1 Hybrid Deer (between, Cervus mexicanus of and C. virginianus ㅇ), of. Born in the Menagerie.
1 Persian Gazelle (Gazella subgutturosa), ơ. Presented by C. H. Watts, Esq.

2 Egyptian Kites (Milous agyptius). Presented by A. Bells, Esq.
3 Green-backed Porphyrios (Porphyrio madagascariensis). Presented by A. Bells, Esq.
1 Ceram Lory (Lorius garrulus). Deposited.
2 Jameson's Gulls (Larus jamesoni). Bred in the Gardens.
20. 1 Macaque Monkey (Macacus cynomolgus). Presented by Miss E. Cattlin.

1 Kinkajou (Cercoleptes caudivolvulus), ㅇ. Presented by M. B. Salmon, Esq. From Demerara.
2 African Civet Cats (Viverra civetta). Presented by M. B. Salmon, Esq.
A Collection of Salmon Fry (Salmo salar), Presented by T. J. Mann, Esq.
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June 21. 1 Garnett's Galago (Galago garnetti), ơ. Presented by F. W. Barff, Esq.
1 Collared Fruit-Bat (Cynonycteris collaris). Born in the Menagerie.
1 West African-Python (Python seba), Deposited.
23. 3 Black Rats (Mus rattus). Born in the Menagerie.

1 Crested Pigeon (Ocyphaps lophotes). Presented by Rev. A. H. Glennie.

3 Spotted-billed Ducks (Anas pocilorhyncha). Bred in the Gardens.
3 Australian Wild Ducls (Anas superciliosa). Bred in the Gardens.
2 Chilian Pintails (Dafla spinicauda). Bred in the Gardens.
2 Lesser Redpoles (Linota rufescens), $\delta^{*}$ and ㅇ. Presented by Dr. Bree, F.Z.S.
24. 2 Black-tailed Godwits (Limosa melanara). Purchased.

2 Tuatera Lizards (Sphenodon punctatus). Purchased. See P.Z.S. 1879, p. 663.

2 Beautiful Parrakeets ( $P_{\text {sephotus pulcherrimus). Purchased. }}$
27. 2 Geoffroy's Doves (Peristera geofffoii). Bred in the Gardens.

4 White Storks (Ciconia alba). Purchased.
30. 1 Black-faced Spider Monkey (Ateles ater). Purchased.

3 Red-billed Tree-Ducks (Dendrocygna autumnalis). Purchased.
1 Grand Galago (Galago crassicaudata). Presented by Mr. W. Jenkins.
1 Puma (Felis concolor), ó. Presented by Lord Lilford, F.Z.S. From Buenos Ayres.
1 Reticulated Python (Python reticulatus). Purchased.
July 1. 1 Grivet Monkey (Cercopithecus griseo-viridis), $\mathrm{d}^{\text {. }}$ Presented by R. M. Courage, Esq.
1 Common Boa (Boa constrictor). Presented by Dr. A, Stradling.
2 White Storks (Ciconia alba). Purchased.
1 Axis Deer (Cervus axis), 오. Born in the Menagerie.
2. 4 Land-Crabs. Received in exchange.

1 Common Whimbrel (Nimenius phaopus). Received in exchange.
4. 1 Rhesus Monkey (Macacus erythraus), 오. Presented by James Bartle, Esq.
1 Blue-eyed Cockatoo (Cacatua ophthalmica). Presented by Lieut.-Col. Arbuthnot, 14th Hussars.
1 Collared Fruit-Bat (Cynonycteris collaris). Purchased. Captured in the Red Sea.
7. 1 Japanese Deer (Cervus sika), or. Born in the Menagerie.

1 Indian Python (Python molurus). Presented by Mr. George Billett.
1 South-American Rat-Snake (Spilotes variabilis). Presented by Mr. George Billett.
8. 1 Yellow-footed Rock-Kangaroo (Petrogale xanthopus), ©t. Purchased.
2 Balearic Crowned Cranes (Balearica pavonina). Purchased.
2 Siamese Pheasants (Euplocamus prcelatus), of 오. Purchased.
1 Darwin's Pucras Pheasant (Pucrasia darwini), oc'. Purchased.
4 Rose-ringed Parrakeets (Paleornis docilis). Purchased.
1 Black-winged Peafowl (Pavo nigripennis), ㅇ. Presented by The Hon. A. S. G. Canning.

July 8. 2 Common Barn-Owls (Strix flammea). Presented by R. A. Baldwin, Esq.
9. 2 Crested Porcupines (Hystrix cristata). Presented by Moses S. Boyle, Esq.
11. 3 Australian Wild Ducks (Anas superciliosa). Bred in the

1 Yellow-billed Duck (Anas xanthorhyncha). Bred in the Gardens.
6 Rosy-billed Ducks (Metopiana peposaca). Bred in the Gar-
12. 1 Striped Hyæna (Hyana striata). Purchased.

4 Black Swans (Cygnus atratus). Purchased.
2 Elliot's Guinea-fowls (Numida ellioti). Deposited.
4 Vulturine Guinea-forls (Nimida vulturina). Deposited.
1 Buff-backed Egret (Ardea russata). Presented by Capt. Burke,
6 Small-scaled Mastigures (Uromastix microlepis). Presented by Capt. Burke, S.S. 'Arcot.' From the Persian Gulf.
1 Hey's Partridge (Ammoperdix heyi). Presented by Capt. Burke, S.S. 'Arcot.' From the Persian Gulf.
1 Gold Pheasant (Thaumalea picta), ठ•. Presented by J. E. Liardet, Esq.
14. 3 GJobose Curassows (Crax globicera), 1 of 2 and Presented by Major F. Hime.
1 European Bearded Vulture (Gypaëtus barbatus). Presented by Lord Lilford, F.Z.S.
1 American Kestrel (Tinnunculus sparverius). Purchased. From San Domingo.
15. 1 Lesser White-nosed Monkey (Cercopithecus petaurista), ơ. Presented by Robert F. Clothier, Esq.
2 Ring-tailed Lemurs (Lemur catta), ơ and 우. Presented by Hugh McCubbin, Esq.
1 Common Ocelot (Felis pardalis), ó. Purchased.
16. 1 Funereal Cockatoo (Calyptorhynchus funereus). Purchased. See P.Z.S. 1879, p. 663.
1 Smooth Snake (Coronella levis). Purchased.
17. 1 White-tailed Gnu (Catoblepas gnu), ơ'. Purchased.

2 Yellow-bellied Parrakeets (Platycercus flaviventris). Purchased.
4 Common Crowned Pigeons (Goura coronata). Purchased.
18. 1 Mule Deer (Cervus macrotis), $\sigma^{*}$. Presented by Herbert H. Carter, Esq. From Wyoming Territory, U.S. A. See P.Z.S. 1879, p. 664.

1 Mule Deer (Cervus macrotis), 오. Presented by E. N. Carter, Esq. See P. Z. S. 1879, p. 664.
1 Lesser Sulphur-crested Cockatoo (Cacatua sulphurea). Presented by Miss Langley.
1 Red-and-yellow Macaw (Ara chloroptera). Deposited.
22. 1 Geoffroy's Marmoset (Midas geoffroii), ${ }^{\text {o'. Purchased. From }}$ Panama.
2 Golden Eagles (Aquila chrysaëtos). Presented by Mrs. A. H. Browne.
1 Stanley Crane (Tetrapteryx paradisea). Received in exchange.
23. 1 Peacock Pheasant (Polyplectron chinquis). Bred in the Gardens.
2 Black-crested Cardinals (Gubernatrix cristatella). Bred in the
Gardens.

July 23. 2 Red-and-yellow Macaws (Ara chloroptera) Presented by Charles Fricker, Esq.
1 Red-and-blue Macaw (Ara macao). Presented by Charles Fricker, Esq.
1 Blue-and-yellow Macaw (Ara ararauna). Presented by Charles Fricker. Esq.
24. 1 Common Trumpeter (Psophia crepitans). Presented by Charles Fricker, Esq.
1 Coquetoon Antelope (Cephalophus rufilatus). Purchased.
2 Geoffroy's Doves (Peristera geoffroii). Bred in the Gardens.
20. 3 Grey Mullets (Mugil capito). Presented by G. H. Jones, Esq. F.Z.S.

1 Conmon Sole (Solea vulgaris). Presented by G. H. Jones, Esq., F. Z.S.
28. 1 Weeper Capuchin (Cebus capucinus), ठ才. Presented by Capt. R. Bond.
29. 2 White-faced Tree-Ducks (Dendrocygna viduata). Purchased.

1 Red-bill Tree-Duck (Dendrocygna autumnalis). Purchased.
1 Central American Agouti (Dasyprocta isthmica). Purchased.
31. 2 Common Crossbills (Loxia curvirostra), $\delta^{2}$ and + P. Presented by H. A. Macpherson, Esq.
1 Allen's Porphyrio (Porphyrio alleni). Captured at sea off Sierra Leone, $5^{\circ}$ N., $14^{\circ}$ Wं. Presented by W. B. Brown, Esq.
Aug. 1. 1 Bateleur Eagle (Helotarsus ecaudatus). From Sierra Leone. Presented by Alex. Sinclair, Esq.
1 Common Cuckoo (Cuculus canorus). Presented by Miss C. Bealey,
2. 1 Spanish Imperial Eagle (Aquila adalberti). Presented by the Marquis de la Granja, F. Z. S.
1 Brown Bear (Ursus arctos). Presented by J. R. Boyce, Esq.
4. 1 Lanner Falcon (Falco lanarius). Deposited.

1 Red-fronted Lemur (Lemur ruffrons), d. Received in exchange.
4 Specious Pigeons (Columba speciosa). Received in exchange.
1 Banded Tinamou (Crypturus noctivagus). Received in exchange.
1 Black Hornbill (Buceros atratus). Received in exchange.
1 Tamandua Ant-eater (Tamandua tetradactyla). Received in exchange.
5. 1 Rude Fox (Canis rudis). Presented by G. H. Hawtayne, Esq., C.M.Z.S. See Ann. N.H. ser. 5, vol.iv. p. 316, et p. 400.
1 Cobella Snake (Liophis cobella). Presented by G. H. Hawtayne, Esq., C.M.Z.S.
1 Coral Snake (Tortrix scytale). Presented by G. H. Hawtayue, Esq., C.M.Z.S.
3 North-American Turkeys (Meleagris gallopavo), 1 ठ and 2 우. Presented by R. Wynne Roberts, Esq.
3 Common Kestrels (Tinnunculus alaudarius). Presented by the Rev. J. E. Campbell Colquhoun.
6. 1 Hybrid Deer (between Cervus elaphus and C. barbarus), ठ". Born in the Menagerie.
1 White-whiskered Swine (Sus lewoomystax), 子. Presented by Theodore Hance, Esq., C.M.Z.S.
2 Vociferous Sea-Eacles (Haliaëtus vocifer). Presented by Dr. J. Kirk, C.M.Z.S.

Aug. 6. 1 Vulturine Guinea-fowl (Numida vulturina). Deposited.
4 Elliot's Guinéa-fowls (Numida ellioti). Deposited.
3 Mitred Guinea-fowls (Numida mitrata). Deposited.
1 Wood-Owl (Syrnium aluco). Presented by Capt. F. Lloyd.
7. 1 Pileated Jay (Cyanocorax pileatus). Purchased.

1 Vulturine Guinea-fowl (Numida vulturina). Deposited.
1 Amherst's Pheasant (Thaumalea amherstia). Bred in the Gardens.
3 Fork-tail Jungle-fowls (Gallus furcatus). Bred in the Gardens.
1 Australian Wild Duck (Anas superciliosa). Bred in the Gardens.
3 Chilian Pintails (Dafla spinicauda). Bred in the Gardens.
7 Brazilian Teal (Querquedula brasiliensis). Bred in the Gar-
8. 1 Grey Flying Squirrel (Sciuropteres fimbriatus), ㅇ. Presented by Mrs. Louisa Edwards.
1 Black-faced Ibis (Theristicus caudatus). Presented by C. H. Whaley, Esq.
2 Black Storks (Ciconia nigra). Purchased.
13. 1 Black Stork (Ciconia nigra). Presented by Prof. J. Reinhardt,
14. 2 Diana Monkeys (Cercopithecus diana), ㅇ. Presented by F. J. Crocker, Esq.
2 Crested Pigeons (Ocyphaps lophotes). Bred in the Gardens.
2 Geoffroy's Doves (Peristera geoffroit). Bred in the Gardens.
2 Black-footed Penguins (Spheniscus demersus). Purchased.
1 Golden Tench (Tinca vulgaris, var). Presented by the Lord Walsingham, F.Z.S.
15. 1 Malbrouck Monkey (Cercopithecus cynosurus), ㅇ. Presented by Miss Agnes Barker.
1 Green Monkey (Cercopithecus callitrichas). Presented by C.
1 Rose-crested Cockatoo (Cacatua moluccensis). Presented by Miss Foster.
16. 1 Common Buzzard (Buteo vulgaris). Deposited.

13 Golden Tench (Tinca vulgaris, var). Presented by the Lord Walsingham, F.Z.S.
18. 1 Chacma Baboon (Cynocephalus porcarius). Deposited.

1 Common Cuckoo (Cuculus canorus). Presented by Mr. J. Shapland.
19. 1 Guinea Baboon (Cynocephalus sphinx) ơ. Presented by P. Lembery, Esq.
20. 1 Bush-Dog (Icticyon venaticus). From British Guiana. Presensented by J. Ernest Tinné, Esq. See P. Z. S. 1879, p. 664.
1 Common Barn-Owl (Strix flammea). Presented by Mr. H. Norris.
21. 1 Cape-Buffalo (Bubalus caffer). Born in the Menagerie.

1 Smooth Snake (Coronella levis). Presented by -Dart, Esq.
22. I Ring-necked Parrakeet (Palcornis torquatus). Presented by Mrs. Watson.
4 Common Spoonbills (Platalea leucorodia). Purchased.
18 Chesnut-breasted Ducks (Anas castanea). Purchased.
23. 1 Adelaide Broadtail (Platycercus adelaide). Purchased.
25. 1 Vervet Monkey (Cercopithecus lalandii), ס'. Presented by W. T. Millar, Esq.

1 Sky-Lark (Alauda arvensis). Presented by F. Buckland, Esq.

Aug, 26. I Squirrel-like Phalanger (Beitideus scureus). Borm in the Menagerie.
1 Common Kestrel (Tinnunculus alaudarius). Presented by Mr. R. Moon.

1 Annulated Snake (Leptodira annulata). Presented by R. T. Davis, Esq.
27. 2 Electric Silurus (Malapterurus beninensis). Purchased.

1 Radiated Tortoise (Testudo radiata). Purchased.
1 Sulphur-breasted Toucan (Ramphastos carinatus). Purchased.
2 Slow Loris (Nycticebus tardigradus). Purchased.
1 Indian Otter (Lutra nair). Purchased. See P. Z. S. 1879, p. 664.

3 Black-necked Stilts (Himantopus nigricollis). Purchased.
2 Cayenne Lapwings (Vanellus cayennensis). Purchased.
30. 1 Chequered Elaps (Elaps lemniscatus). Presented by Dr. A. Strading.
1 Rose-Hill Broadtail (Platycercus eximius). Presented by Arthur Stirling, Esq.
1 Red-winged Parrakeet (Aprosmictus erythropterus). Deposited.
31. 3 Hormed Lizards (Phrynosoma cornutum). Presented by Ernest E. Sable, Esq., F.R.G.S.

Sept. 2. 2 Great Bustards (Otis tarda), of and 오. Presented by J. C. Forster, Esq.
3. 1 European Bearded Tulture (Gypaëtus barbatus). Deposited by L.ord Lilford, F.Z.S.
1 Rock-Cavy (Cerodon rupestris). Purchased.
1 Crab-eating Opossum (Didelphys cancrivora). Purchased.
I Superb Tanager (Calliste fastuosa). Purchased.
1 Black-shouldered Tanager (Calliste melanonota). Purchased.
1 Crowned Tanager (Tachyphonus coronatus), ơ. Purchased.
1 Palm-Tanager (Tanagra palmarum), ㅇ. Purchased.
1 Thick-billed Tanager (Euphonia crassirostris). Purchased.
1 Brazilian Blue Grosbeak (Guiraca cyanea). Purchased.
2 Horrid Rattlesnakes (Crotalus horridus), juv. Purchased.
2 Tuberculated Iguanas (Iguana tuberculata). Purchased.
4. 1 Macaque Monkey (Macacus cynomolyus), ơ. Presented by Mrs. James Raves.
1 Bonnet-Monkey (Macacus radiatus), 우. Presented by Mrs. James Rates.
1 Tiger (Felis tigris), 오. Presented by His Excellency the Rt. Hon. Lord Lytton, G.C.B., G.M.S.I.
2 Indian Leopards (Felis pardus). Presented by his Excellency the Rt. Hon. Lord Lytton, G.C B., G.M.S.I.
5. 2 Common Chameleons (Chameleon rulgavis). Presented by Alfred Ely, Esq. From Cyprus.
1 Sœmmerring's Gazelle (Gazelle sommerringi), 오. Purchased.
1 Ashy-headed Goose (Bernicla poliocephala). Purchased.
1 Upiand Goose (Bernicla magellanica), ㅇ.. Purchased.
2 All-green Parrakeets (Brotogerys tiriacula). Presented by Dr. A. Stradling.
2 Elegant Parrakeets (Euphema elegans). Purchased.
1 Chilian Pintail (Dafia spinicauda). Presented by Mr. W. Petty.
1 Chilian Teal (Querquedula creccoides). Presented by Mr. W. Petty.

Sept. 8. 1 Common Jackal (Canis aureus). Presented by Thomas Thursfield, Esq., M.R.C.V.S.
2 Martinican Doves (Zenaida martinicana). Presented by Capt. Henry King.
1 Black-faced Spider Monlrey (Ateles ater). Presented by Capt. Henry King.
2 Black Tortoises (Testudo carbonaria). Presented by Capt. Henry King.
1 Vulpine Squirrel (Sciurus vulpinus, var. capistrata). Purchased.
1 African Brush-tailed Porcupine (Atherura africana). Purchased.
9. 2 Hybrid Pale-headed Tree-Boas (between Epicrates angulifer, $\sigma^{*}$ and Chilobothrus inornatus, 9 ). Born in the Gardens.
10. I Plantain-Squirrel (Sciurus plantani). Presented by Miss Lizzie Casey.
1 Demeraran Cock-of-the-rock (Rupicola crocea), 才. Presented by R. S. Fraser, Esq.
1 King Parrakeet (Aprosmictus scapulatus), 0". Presented by George Wood, Esq.
11. 1 Red-and-blue Nacav (Ara macao). Deposited.

1 Red-and-yellow Macaw (Ara chloroptera). Deposited.
12. 1 Guinea Baboon (Cynocephalus sphinx), ơ. Presented by F. Naylor, Esq.
14. 1 White-fronted Capuchin (Cebus albifrons). Presented by Major H. L. Gleig.
15. 2 Domestic Sheep (Ovis aries), ơ. Presented by R. B. N. Walker, Esq., C.M.Z.S.
1 Common Cuckoo (Cuculus canorus). Presented by Mrs. Bolton.
1 Square-spotted Snake (Oxyrrhopus doliatus). Presented by H. Colgate, Esq.
16. 1 Turquoisine Grass-Parrakeet (Euphema pulchella), ㅇ. . Presented by J. Fraser, Esq.
1 Common Cuckoo (Cuculus canorus). Presented by Miss C. Bealey.
17. 1 Ring-tailed Coati (Nasua rufa), ơ. Presented by Charles S. Barnes, Esq.
18. I Chacma Baboon (Cynocephalus porcarius). Deposited.

1 Yellow Baboon (Cynocephalus babouin). Deposited.
1 Mitred Pelican (Pelecanas mitratus). Presented by Dr. Holub.
1 Caracal (Felis caracal). Presented by Dr. Holub.
1 Secretary Vulture (Serpentarius reptilivorus). Presented by Dr. Holub.
1 Sociable Vulture (Vultur auricularis), Deposited.
1 Isabelline Antelope (Cervicapra isabellina). Deposited.
2 Tawny Eagles (Aquila nevioides). Presented by Dr. Holub.
2 Cape Crowned Cranes (Balearica regulorum). Deposited.
1 Stanley Crane (Tetrapteryx paradisea). Deposited.
19. 1 Ring-tailed Coati (Nasua rufa). Presented by Percy Brewis, Esq., F.Z.S.
1 Common Fox (Canis vulpes). Presented by James Wheatley, Esq.
2 Dunlins (Tringa cinclus). Presented by E. A. F. Elliot, Esq.
1 Turnstone (Strepsilas interpres). Presented by E. A. F. Elliot, Esq.

1. Ringed Plover (AFialitis hiaticula). Presented by E. A. F. Elliot, Esq.

Sept.22. 1 Silky Marmoset (Midas rosalia), ס. Deposited.
1 King Parrakeet (Aprosmictus scapulatus), 오. Presented by Gen. Blake.
1 Brown Bear (Ursus arctos), $\boldsymbol{J}^{\circ}$. Received in exchange.
23. 1 Malbrouck Monkey (Cercopithecus cynosurus), б. Purchased.

1 Red-billed Tree-Duck (Dendrocygna autumnalis). Purchased.
24. 1 White-backed Piping Crow (Gymnorhina leuconota). Presented by Mrs. Buchanan.
25. 1 Norwegian Lemming (Myodes lemmus). Presented by James Shuter, Esq.
1 Vervet Monkey (Cercopithecus lalandii), 오. Presented by E. Meyerstein, Esq.
1 Black Rat (Mus rattus). Presented by R. M. Middleton, Esq. From Rangoon.
1 Bonelli's Eagle (Nisaetzs fasciatus). Presented by Capt. W. P. Forwood. From Mogador.
27. 2 Common Buntings (Emberiza miliaria). Presented by J. Young, Esq.
29. 2 Malabar Mynahs (Sturnia malabarica). Presented by A. F. Wiener, Esq., F.Z.S.
1 Chinese Mynah (Acridotheres cristatellus). Presented by A. F. Wiener, Esq., F.Z.S.

1 Waxwing (Ampelis garmula). Presented by A. F. Wiener, Esq., F.Z.S.

Oct. 1. 1 Anaconda (Eunectes murinus). Presented by Capt. E. Ball.
2. 1 Elliot's Guinea-fowl (Numida ellioti). Purchased. See P. Z. S. 1879, p. 713.

1 Vulturine Guinea-fowl (Numida vulturina). Purchased.
3 Mitred Guinea-fowls (Numida mitrata). Purchased.
3. 3 Vulturine Guinea-fowls (Numida vulturina). Presented by Vice-Admiral John Corbett, C.B.
1 Crested Guinea-fowl (Numida cristata). Presented by ViceAdmiral John Corbett, C.B.
7 European Tree-Frogs (Hyla arborea). Presented by the Rev. S. R. Wilkinson, F.Z.S.

1 Green Lizard (Lacerta viridis). Presented by the Rev. S. R. Wilkinson, F.Z.S.
3 Spotted Salamanders (Salamandra maculosa). Presented by the Rev. S. R. Wilkinson, F.Z.S.
4. 1 Vervet Monkey (Cercopithecus lalandii), ơ. Presented by Sir Arthur Scott, Bart.
1 White-cheeked Capuchin (Cebus lunatus), ס". Presented by Adrian Hope, Esq., F.Z.S.
1 Red Fox (Canis fulous). Presented by Lord Hobart. From Labrador.
1 Rough-legged Buzzard (Archibuteo lagopus). Presented by Lord Hobart.
5. 5 Fat Dormice (Myoxus glis). Presented by Edwin Liot, Esq. From Serrach, near Esslingen, Würtemburg.
1 Booted Eagle (Nisaetus pennatus). Purchased.
6. 5 Peregrine Falcons (Falco peregrinus). Presented by Sir Mathew W. Ridley, Bart., M.P.
4 European Tree-Frogs (Hyla arborea). Presented by H. A. Macpherson, Esq.
1 Fire-bellied Toad (Bombinator igneus). Presented by H. A. Macpherson, Esq.

Oct. 6. 1 Natterjack Toad (Bufo calamita). Presented by H. A. Macpherson, Esq.
2 Rendall's Guinea-fowls (Numida rendalli). Purchased.
7. 1 Chacma Baboon (Cynocephalus porcarius), ơ. Deposited.

1 Macaque Monkey (Macacus cynomolgus), 오. Presented by W. Leckie.

2 Saffron Finches (Sycalis flaveola). Bred in the Gardens. 1 Lacertine Snake (Coelopeltis lacertina). Purchased.
8. 6 European Tree-Frogs (Hyla arborea). Presented by A. Leipner, Esq, F.Z.S.
3 Royal Pythons (Python regius). Received in exchange.
10. 1 Javan Peafowl (Pavo spicifer). Received in exchange.

1 European Scops Owl (Scops giu). Purchased.
13. 2 Arabian Gazelles (Gazella arabica), ㅇ. Presented by Capt. W. Bowden Smith, R.N.
1 Common Waxbill (Estrelda cinerea). Presented by J. C. Thorowgood, Esq.
14. 1 Macaque Monkey (Macacus cynomolgus). Presented by T. Hobbs, Esq.
2 Chinese Tree-Pies (Dendrocitta sinensis). Presented by Mr. Charles Rice.
1 Bosman's Potto (Perodicticus potto). Purchased. From Sulymah, S.W. coast of Africa.
2 Crested Colins (Eupsychortyx cristatus), ס and ㅇ. Purchased.
1 Sun-Bittern (Europyga helias). Deposited.
16. 1 Great Bustard (Otis tarda), ㅇ. Presented by George $G$. Sandeman, Esq.
17. 1 Rhesus Monkey (Macacus erythreus), ㅇ. Presented by Dr.

1 Rhesus Monkey (Macacus erythrceus), ㅇ. Presented by R. C. Bonsfield, Esq.
2 Common Starlings (Sturnus vulgaris). Presented by Fred. J. Barry, Esq.
2 Song-Thrushes (Turdus musicus). Presented by Fred. J. Barry, Esq.
2 Goldfinches (Carduelis elegans), $\sigma^{*}$ and 9. Presented by Fred. J. Barry, Esq.
3 Common Chaffinches (Fringilla coelebs), 2 o 1 ㅇ. Presented by Fred. J. Barry, Esq.
2 Lesser Redpoles (Linota rufescens). Presented by Fred. J. Barry, Esq.
I Common Linnet (Linota cannabina). Presented by Fred. J. Barry, Esq.
2 Common Greenfinches (Ligurinus chloris). Presented by Fred. J. Barry, Esq.
1 Yellow Bunting (Emberiza citrinella). Presented by Fred. J. Barry, Esq.
1 Sky-Lark (Alauda arvensis). Presented by Fred. J. Barry, Esq.
18. 1 Bonnet-Monkey (Macacus radiatus), ㅇ. Presented by Mrs. Bonamy Dobree.
20. 1 Bonnet-Monkey (Macacus radiatus). Presented by S. E. Phillips, Esq.
1 Sœmmerring's Antelope (Gazella scmmervingi), ס". Purchased.
2 Dufresne's Amazons (Chrysotis dufresniana). Purchased.

Oct. 20.2 Yellow Buntings (Emberiza citrinella). Purchased.
2. Common Linnets (Linota cannabina). Purchased.
21. I Macaque Monkey (Macacus cynomolgus), ס". Presented by Mrs. Franklin.
23. 1 Bonnet-Monkey (Macacus radiatus), ơ' Presented by J. E. Medley, Esq.
1 Lesser Black-backed Gull (Larus fuscus). Presented by the Rev. F. H. Addams.
24. 1 Banded Ichneumon (Herpestes fasciatus). Purchased.

1 Garnett's Galago (Galago garnetti). Purchased.
25. 1 Mississippi Alligator (Alligator mississippiensis). Presented by Capt. J. H. Mortimer.
3 Land Hermit Crabs (Conobita diogenes). Presented by Capt. J. H. Mortimer. From Bermuda.

2 American May-fishes (Fundulus majalis). Presented by Capt. J. H. Mortimer.
27. I Silver Pheasant (Euplocamus nyctemerus), ס゙. Presented by Mr. R. Moon.
28. 1 Weeper Capuchin (Cebus capucinus) 우. Presented by A. Sargent, Esq.
4 Pied Wagtails (Motacilla yarrellit). Purchased.
1 Bosman's Potto (Perodicticus potto). Purchased.
31. 1 Caffer Cat (Felis caffra). Presented by R. Southey, Esq.

Nov. 1. 3 Common Boas (Boa constrictor). Presented by W. Young, Esq.
3. 1 Common Weasel (Mustela vulgaris). Purchased.
4. 1 Vervet Monkey (Cercopithecus lalandii), ơ. Deposited.

1 Common Barn-Owl (Strix fammea). Presented by F. Bagnall, Esq.
5. 2 Black Bass (Huro nigricans). Purchased.
6. 2 Variegated Bitterns (Ardetta involucris). Purchased.

2 White-spotted Rails (Rallus maculatus). Purchased.
1 Sooty Rail (Rallus rhytirhynchus), Purchased.
2 Boatbills (Cancroma cochlearia). Purchased.
2 Moustache-Monkeys (Cercopithecus cephus). Purchased.
1 Common Night-Heron (Nycticorax grisere). Purchased.
1 Axis Deer (Cervus axis), ơ. Purchased.
7. 1 Mona Monkey (Cercopithecus mona), 오. Deposited.

1 Malbrouck Monkey (Cercopithecus cynosurus), ㅇ. Deposited.
8. 1 Rhesus Monkey (Macacus erythreus). Presented by Thos. G. Anderson, Esq.

1 Quebec Marmot (Arctomys monax). Purchased.
11. 8 Silky Bower-birds (Ptilorhynchus violaceus). Received in exchange.
1 Water-Rail (Rallus aquaticus). Purchased.
13. 1 Ponatorhine Skua (Stercorarius pomatorhinus). Presented by F. L. Smith, Esq.

1 Woodcock (Scolopax rusticula). Presented by Mr. J. Pollard.
1 Cinereous Vulture (Vultur monachus). Deposited.
14. I Bonnet-Monkey (Macacus radiatus), q. Presented by L. H. Ruegg, Esq.
1 Mace's Sea-Eagle (Haliaetus leucoryphus). Presented by Capt. Butler.
1 King Penguin (Aptenodytes pennanti). Purchased. From Staten Island, Cape Horn. See P. Z. S. 1879, p. 763.

Nov. 15. 1 Banded Ichneumon (Herpestes fasciatus). Presented by H. L. Cocksedge, Esq.

1 Downy Owl (Pulsatrix torquata). Presented by Dr. A. Stradling.
1 Anaconda (Eunectes murinus). Purchased.
17. 1 Gaimard's Rat Kangaroo (Hypsiprymnus gaimardi), 8". Born in the Menagerie.
2 Common Siskins (Chrysomitris spinus). Purchased.
1 Reed-Bunting (Emberiza schcerichlus). Purchased.
1 Pied Wagtail (Motacilla yarrellii). Purchased.
1 Little Grebe (Podiceps minor). Presented by A. F. Buxton, Esq.
18. 2 Barbary Falcons (Falco barbarus). Deposited.
20. 1 Yellow Baboon (Cynocephalus babouin), f. Presented by Cecil B. Hankey, Esq.
1 Common Curlew (Numenius arquata). Deposited.
1 Red-throated Diver (Colymbus septentrionalis). Deposited.
1 South-American Rat-Snake (Spilotes variabilis). Presented by Thomas Horrod, Esq.
21. 2 Geoffroy's Cats (Felis geoffroir). Deposited.

2 Smooth Snakes (Coronella lavis). Born in the Menagerie.
22. 2 Domestic Sheep (Ovis aries), ㅇ․ Presented by H. Sandbach, Esq.
1 Collared Peccary (Dicotyles tajacu). Presented by H. Sandbach, Esq.
25. 1 Macaque Monkey (Macacus cynomolgus), of. Deposited.

1 Common Wood-Owl (Syrnium aluco). Presented by J. Smith, Esq.
20. 1 Torquoisine Parrakeet (Euphema pulchella), 우. Presented by A. Battescombe, Esq.
27. 1 Barbary Falcon (Falco barbarus), ㅇ. Deposited.
28. I Reeves's Muntjac (Cervulus reevesi), ot. Born in the Menagerie.

Dec. 1. 1 Laughing Falcon (Herpetotheres cachinnans). Purchased.
1 Slow Loris (Nycticebus tardigradus). Purchased.
1 Bar-tailed Godwit (Limosa lapponica). Purchased.
1 Common Curlew (Numenius arquata). Purchased.
2. 2 Pin-tailed Whydah-birds (Vidua principalis), ס". Presented by Capt. T. H. Bowyer.
4. 2 Pronghorn Antelopes (Antilocapra americana), $\delta^{*}$ and $ㅇ+$. Purchased. See P.Z. S. 1880, p. 22.
$2 \begin{aligned} & \text { Red River-hogs (Potamochicrus penicillatus). ㅇ. Depo- } \\ & \text { sited. }\end{aligned}$
1 Elephantine Tortoise (Testudo elephantina). Deposited.
5. 2 Pomatorhine Skuas (Stercorarius pomatorhinus). Purchased. 2 Common Chameleons (Chamaeleon vulgaris). Presented by Capt. Burke.
6. 1 Nississippi Alligator (Alligator mississippiensis). Presented by W. G. Marshall, Esq.
7. 2 Elliot's Guinea-fowls (Nemida ellioti). Deposited.

2 Slowworms (Anguis fragilis). Presented by W. A. H. Bernhard Smith, Esq.
11. 1 Rhesus Monkey (Macacus erythreaus), 오. Presented by F. J. Lightfoot, Esq.

1 Black-headed Jay (Cyanocorax cyanomelas). Purchased,
Dec. 12. 2 Brent Geese (Bernicla brenta). Purchased.

Dec. 12. 1 Bonnet-Monkey (Macacus radiatus), ס". Presented by the Rev. E. C. Ince.
1 Ring-tailed Lemur (Lemur catta), 우, Presented by F. E. Colenso, Esq.
15. 1 Puff-Adder (Vipera arietans). Presented by the Rev. G. H. R. Fisk, C.M.Z.S.
16. 1 Houbara Bustard (Houbara undulata). Purchased.
17. 1 Malbrouck Monkey (Cercopithecus cynosurus), ס夭. Presented by the Rev. J. L. Sabungie.
1 Bonnet-Monkey (Macacus radiatus). Presented by R. Monstray Drury, Esq.
18. 1 Bodinus's Amazon (Chrysotis bodini). Purchased. See P. Z. S. 1880, p. 23.

1 Red-tailed Amazon (Chrysotis erythrura). Purchased. See P. Z. S. 1880, p. 23, pl. ii.

1 Dufresne's Amazon (Chrysotis dufresniana). Received in exchange.
21. 1 Vulpine Phalanger (Phalangista vulpina). Presented by W. T. Lackey, Esq.
22. 1 Geoffroy's Dove (Peristera geoffroii). Bred in the Gardens.
24. 1 American Charr (Salmo fontinalis). Presented by F. Buckland, Esq., F.R.S.
5 Salmon-Trout (Salmo trutta). Presented by F. Buckland, Esq., F.R.S.
3 Golden Tench (Tinca vulgaris). Presented by F. Buckland, Esq., F.R.S.
26. 1 Vulpine Phalanger (Phalangista vulpina). Bred in the Gardens.
29. 2 Reed-Buntings (Emberiza schœeniclus). Purchased.
30. 1 Macaque Monkey (Macacus cynomolgus), ㅇ. Presented by Mrs. L. C. Piggott.
1 Black-tailed Parrakeet (Polytelis melanurus). Purchased.
31. 1 Common Ocelot (Felis pardalis), $\mathbf{J}^{*}$. Purchased.

1 Harpy Fagle (Thrasaetus harpyia). Purchased.
2 Naked-throated Bell-birds (Ekasmorhynchus nudicollis). Purchased.
1 Tamandua Ant-eater (Tamandua tetradactyla). Purchased.

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A second Title-page and List of Plates are given with this Part, for the use of those who prefer to bind up the Plates in a separate volume.


[^0]:    ${ }^{1}$ Dr. Thorell writes to me, lately, that he has just received from New Guinea, or the neighbouring islands, the males, "true pygmies," of Gasteracantha lepelletieri and G. crucigera, Bradley, descriptions of which I hope we shall soon have from the pen of that able arachnologist. The only other known male of Gasteracantha is that of G. parvula, Thor., from Singapore.

[^1]:    ${ }^{1}$ I may here note that the name europeus has been supposed to have priority over Gray's specific title, being sometimes quoted as from J. Brookes's 'Catalogue' of his Anatomical and Zootomical Museum (1830), a reference which has even found its way into Engelmann's 'Bibliotheca.' A copy of this list is preserved in the library of the Royal Nociety; and it proves to be merely a sale-catalogue, with no claim whatever to be regarded as a scientific publication.

[^2]:    ${ }^{1}$ Cat. Coll. R. Coll. Surg. part v. 1831, p. 17. The exact date given in Lord Egremont's letter is " 2 nd August, 1810 ;" but from the context it is evident that this is a misprint for April.

[^3]:    ${ }^{1}$ Forstzoologie, i. p. 230. $\quad 2$ Antelope and Deer of America, pp. 232, 233.
    Forstzoologie, i. p. 211. ${ }^{4}$ Descent of Man (2nd ed.), p. 502.

[^4]:    ${ }^{1}$ Tom. cit. p. 504.
    ${ }^{2}$ Sir V. Brooke, P. Z. S. 1878, p. 884.
    ${ }^{3}$ Blyth, as quoted by Mr. Darwin, ' Descent of Man,' p. 505.
    ${ }^{4}$ Cf. P. Z. S. 1867, p. 183, et 1871, p. 493.

[^5]:    ${ }^{1}$ See P. Z. S. 1878, p. 976, pl. 1xi.
    ${ }^{2}$ See P. Z. S. 1875, p. 61, pl. xi.

[^6]:    ${ }^{1}$ I cannot agree with Dr. Finsch's transfer of the name alexandri (Linn.) from the bird usually so called (i. e. eupatrius, Finsch) to the present species, for which the first name properly applicable seems to be javanicus of Osbeck, given in J. R. Forster's translation of Osbeck's Voyage to China, \&c., vol. i. p. 156 (1781).
    ${ }^{2}$ Journ. Asiatic Soc. of Bengal vol. xv. 1846, p. 189.

[^7]:    ${ }^{1}$ Owen, Trans. Zool. Soc. vol. v. pl. 24. figs. 8 \& 9.
    ${ }^{2}$ Journ. Asiatic Soc. Bengal, 1846, p. 189, vol. x7.

[^8]:    1 Vide P. Z. S. 1874, p. 666.
    ${ }^{2}$ Catalogue of Carnivorous, Pachydermatous, and Edentate Mammalia in the British Museum, 1869, p. 143.

[^9]:    ${ }^{2}$ P. Z. S. 1873, p. 198.
    ${ }^{2}$ P. Z. S. 1869, p. 482.

[^10]:    ${ }^{1}$ Doubtless Haliastur intermedius.

[^11]:    ${ }^{1}$ Contributions to the Natural History of Labuan and the adjacent Coasts of Borneo. By James Motley of Labūan, and L. L. Dillwyn. Part 1. 8ro, 1855.

[^12]:    ${ }^{1}$ It is probable, however, that some of the birds were from the mainland; and I only refer to those whose existence has been confirmed by the more recent collectors.
    ${ }^{2}$ "On a Collection of Birds from Labuan. By R. Bowdler Sharpe," P. Z. S. 1875, pp. 99-111, pl. xxii.

[^13]:    ${ }^{1}$ Amsterdam, 2 vols., 1813 and 1815.
    ${ }^{2}$ Vide Temminck, loc. cit. pl, i. fig. 2.

[^14]:    ${ }^{1}$ Loc. cit. pl. i. fig. 4.

[^15]:    ${ }^{1}$ Vide Temminck, loc. cit. pl. viii. fig. 1 .
    ${ }^{2}$ Loc.cit. pl. v. fig. 1.

[^16]:    ${ }^{1}$ Antilope crispa, Siebold, Faun. Japon. Mamm. p. 55, tab. xrii.

[^17]:    Klaboana macularia.
    Gynautocera macularia, Guér. Deless. Toy. p. 83, pl. 25. fig. 2. Hab. Malacca.

[^18]:    Chilla bimaculata, n. sp.
    Male and Female. Ochreous-yellow, deepest on fore wing and

[^19]:    ${ }^{1}$ Tome iii. partie 3, pp. 101-156, pls. 19-24.

[^20]:    ${ }^{1}$ This animal was a female, and was supposed to be, when it arrived in Paris, about four years old. (It was probably much older.) It was then $7 \frac{1}{2}$ feet high, but during the thirteen years it lived at Versailles only grew 1 foot in height. M. Perrault gives a figure of this specimen on pl. 19 of his memoir; this figure clearly shows the enormous ears characteristic of the African Elephant, but is very defective as regards the hind, and particularly the fore, feet.
    ${ }^{2}$ Besides this, there are a few short statements on various parts of the anatomy of $E$. africanus in Prof. Flower's lectures on the digestive organs of Mammalia (alluded to below) and in Prof. Macalister's recently published 'Morphology of Vertebrata.' Donitz has described the kidney (Reichert \& Du Bois-Reymond's Archiv, 1872, p. 85).
    ${ }^{3}$ For an account of the introduction of African Elephants into Europe, see a letter by Carl Hagenbeck, the well-known animal-dealer of Hamburg, in 'Land and Water,' March 29, 1879.
    ${ }_{5}^{4}$ L. c. pp. 56-92, t. v.-vii.
    ${ }^{5}$ Unfortunately this was not effected till about one week after the death of the animal. This fact, as well as the deaths of several other large animals requiring examination at the same period, made the preliminary dissections rather hurried, and must be an excuse for auy errors or omissions in the following descriptions.

[^21]:    ${ }^{1}$ The amount of literature on the anatomy of the Indian Elephant is rery considerable. A résumé of the principal papers on the subject will be found in Dessis. Miall and Greenwood's 'Anatomy of the Indian Elephant' (pp. 6, 7), recently publisked, a book which is itself a useful compendium of our present knowledge of Proboscidean anatomy. The myology, however, is described at greater length than any other parts.
    ${ }^{2}$ Dr. Mojsisorics's figure ( $\ell . c$. Taf. v. fig. 1) is evidently taken from a preserved and distorted specimen, and fails to show accurately the real shape of the tongue when fresh.

[^22]:    ${ }^{1}$ L. c. p. 62, Taf. v. fig. 1, pe. ${ }^{2}$ Journ. Anat. Phys. viii. 1873, p. 91.
    ${ }^{3}$ P. Z. S. 1875, p. 365, and figure.
    ${ }^{4}$ This was unfortunately damaged in removing the brain; consequently I can give no details.
    ${ }^{5}$ My friend Mr. W. Ottley, of Unirersity College, was kind enough to help me by dissecting out and measuring these glands.

[^23]:    ${ }^{1}$ Mr. Bartlett tells me that in both sexes of the African Elephant the peculiar temporal gland, which is found in the Indian species, and opens externally between the eye and ear, is certainly present. I omitted, unfortunately, to look for it.
    ${ }^{2}$ Mayer's figure (Nov. Act. Acad. C. L. vol. xxii. pt. 1, pl. iv. fig. 3, 1847) of the stomach of the Indian species does not sufficiently indicate the regularly zonary nature of these folds; in that of Sir James Emerson Tennent ('The Wild Elephant,' p. 59 [1867]), on the other hand, these folds are represented as much too regular and sharply defined.

[^24]:    ${ }^{1}$ Perrault gives 38 feet and 22 feet as the lengths of the small and large intestines respectively in his specimen; so that the ratios of the two measurements are nearly the same. The cacum measured $1 \frac{1}{2}$ foot.
    ${ }^{2}$ Med. Times and Gazette, Oct. 5, 1872, p. 372.
    ${ }^{3}$ In a liver of $E$. indicus, in the Royal College of Surgeons ( 810 F ) there is visible, at the place where the round ligament is lost in the substance of the liver, a narrow fissure, which runs obliquely for some way towards the margin, but does not reach it; so that there is no notch formed.

[^25]:    ${ }^{1}$ Perrault gives 3 feet by 7 inches.

[^26]:    ${ }^{1}$ In a specimen ( 2776 A ) in the College of Surgeons of the uterus \&c. of $E$. indicus, the "corpus uteri" is very much more capacious than in my (young) specimen, is about 7 inches long, and is only separated off from the "secondary vagina" by a prominent zonary fold of mucous membrane. The calibres of these two chambers are about the same.

[^27]:    ${ }^{1}$ This raised part, on which is the opening of the urethra. is probably identical with the "Klappe" figured by Mayer (l.c. pl. vi. fig. 1) as existing between the two orifices of the bladder and vagina.
    ${ }^{2}$ In Perrault's adult example the length was 3 feet 6 inches.

[^28]:    ${ }^{1}$ Revisiou of the Echini, p. 399 (1879-1874).
    ${ }^{2}$ Archiv für Naturgeschichte, xxxviii. p. 293, xxxix. p. 308.
    ${ }^{3}$ Op. cit. xxxviii. p. 298.
    ${ }^{*}$ Illustrated Catalogue, Mus. Comp. Zool. viii. p. 6 (1874).
    ${ }^{5}$ Cat. M. C. Z. viii. i. p. ©.

[^29]:    ${ }_{2}^{1}$ Sitzungsb. Ak. Wien, lxx. p. 202.
    ${ }^{2}$ Emend. ex Donacola, Gould, P. Z. S. 1845, p. 80.

[^30]:    * P.S. July 22.-T have now made the comparison, and consider this specimen to be correctly deternined. But the type (Mus, Paris) is an immature bird.P. L. S.

[^31]:    ${ }^{1}$ Since this paper was read we have received vol. vii. No. 6, of 'Stray Feathers.' At p. 472 is a paper by Mr. A. O. Hume on this species, which leaves the true plumage of the female still in some state of uncertainty. Either the bird described by him is a female in a younger stage of plumage, or Capt. Brydon and Lieut. Macgregor, who have kept these birde in captivity, are mistaken as to the female putting on the red colour about the neck and thus assimilating the plumage of the male to this extent.-H. H. G.-A.

[^32]:    ${ }^{1}$ Fur-bearing Animals, pp. 59-96, pls. ii., iv.
    ${ }^{2}$ Reise in Sibir., ii. Th. ii. pp. 68, 69, pl. ii. figs. 1-6.

[^33]:    ${ }_{3}^{1}$ Brit. Zoology, 1768, i. p. 81. ${ }^{2}{ }^{2}$ Mem. Brit. Quad. (1809), pp. 164, 169.
    ${ }^{3}$ Hist. Brit. Anim. (1828), pp. 14, 15.
    ${ }_{5}^{4}$ Man. Brit. Vert. An. (1835), p. 11.
    ${ }_{6}^{5}$ Gard. and Menag. of the Zool. Soc. (1835), i. pp. 227-240.
    ${ }^{6}$ Brit. Quadr. 1st ed. (1837), pp. 167-176.

[^34]:    ${ }^{2}$ Brit. Quadr. (Nat. Libr. xx. 1838), pp. 166-173.
    ${ }_{2}$ Nat. Hist. Ireland (1856), iv. p. 9. ${ }^{3}$ Brit. Quadr. 2nd ed. (1874), p. 212.

[^35]:    ${ }^{1}$ P.Z.S. 1873, p. 790. ${ }^{2}$ Sverg. og Norg. Ryggradsdjur, p. 535.
    ${ }^{3}$ Zoologist, 1877, p. 291. ${ }^{4}$ Zoologist, 1866, p. 242.
    ${ }^{5}$ F. Norgate, 'Zoologist,' 1879, p. 172; J. H. Gurney, tom. cit. p. 210.
    ${ }^{6}$ J. O. Mansel-Pleydell, tom. cit., p. 171.
    ${ }^{7}$ P. L. Sclater', 'Zoologist,' 1845, p. 1018.
    ${ }^{3}$ Zoologist, 1844, p. 783. ${ }^{9}$ Zoologist, 1878, p. 127.
    ${ }^{10}$ Nat. Hist. Irel. iv. p. $9 . \quad{ }^{21}$ Proc. R. Soc. Dubl. 1878.

[^36]:    ${ }^{2}$ See P. Z. S. 1873, p. 128, and 1875, p. 541.
    ${ }^{2}$ Mapa de la provincia de Antioquia en la republica de Nuera Granada, trazada de acuerdo con los mas modernos reconocimientos por C. S. de Greiff. Gravada por Alexis Orgiazzi, grarador del cleposito de la guerra. Paris, 18 ã.

[^37]:    ${ }^{2}$ On the Birds received in Collections from Santa Fé di Bogota. By Philip Lutley Sclater, M.A., P. Z. S. 1855, p. 131.
    [This paper was afterwards separately printed and published, with an appendix containing a list of authorities added to it, under the following title :-

    On Birds received in Collections from Santa Fé di Bogota. By Philip Lutley Sclater, M.A., Fellow of Corpus Christi College, Oxford, F.Z.S. \&c. From the Proceedings of the Zoological Society, July 24, 1855. London. Printed for the Society. Sold at their House in IIanover Square, and by Messrs. Longman, Brown, Green and Longman, Paternoster Row.]

    On some additional species of Birds receired in Collections from Bogota. By Philip Lutley Sclater, M.A., P. Z. S. 1856, p. 25.

    Further Additions to the List of Birds received in Collections from Bogota. By Philip Lutley Sclater, M. A., P. Z. S. 1857, p. 15.
    ${ }^{2}$ Note sur les Trochilidées de la Nouvelle Grenade. Par M. L. Geoffroy, Contr. de Colombia, Bogota, 1861.
    ${ }^{3}$ "Catalogue of Birds collected during a Surve y on a Route for a Canal across the Isthmus of Darien, by order of the Government of the United States, made by Lieut. N. Michler, of the U.S. Topographical Engineers, with Notes and Descriptions of new Species." By John Cassin. Proc. Acad, Nat. Sci. Philad. 1860, 19. 131 and 188.

    4 "Notes on some of the Birds of the United States of Colombia. By Claudo W. Wyatt," Ibis, 1871, pp. 113, 319, and 373.

[^38]:    I "On a Collection of Birds from the Sierra Nevada of Santa Marta, Colombia. By O. Salvin and F. D. Godman," Ibis, 1879, p. 106.

[^39]:    ${ }^{1}$ See P. Z. S. 1857, p. $79 .{ }^{2}$ Cat. A. B. p. 242. ${ }^{3}$ Mus. Hein. ii. p. 88.

[^40]:    ${ }^{1}$ See Rev. Zool. 1843, p. 1.

[^41]:    ${ }^{1}$ These species also occur in Ecuador collectious.

[^42]:    ${ }^{1}$ Monograph of the Hornbills, part i.
    ${ }^{2}$ See Casteln. Voy. Mamm. pl. iv. fig. 2, and Bates's Amazons (1864), p. 388.
    ${ }^{3}$ Sittace leari, Finsch, Papageien, i. p. 392.

[^43]:    1 Zeitsch. für wissenschaftl, Zoologie, Leipzig, 1878, pp. 297-344.
    ${ }^{2}$ For Part I. see P. Z. S. 1878, p, 393.

[^44]:    9. Pecten maximús, Linné.

    Ostrea maxima, L. S. N. p. 1144.
    P. maximus, B. C. ii. p. 73 ; v. p. 169, pl. xxiv.
    'Porcupine' Exp. 1870: Atl. St. Vigo B., Tangier B.; Med. Algesiras B., G. Bona, Benzert Road. Young specimens.

[^45]:    ${ }^{1}$. A little pod.

[^46]:    14. Leda pusio, Philippi.

    Nucula pusio, Ph. Moll. Sic. ii. p. 47. t. xv. f. 5.
    L. pusio, var. latior, Jeffr. Ann. and Mag. N. H. Nov. 1876, p. 430.
    'Porcupine' Exp. 1869; St. 16, 28; 1870, Atl. 3a, 16, 17a, off

[^47]:    ${ }^{1}$ Nearly equilateral.

[^48]:    ${ }^{1}$ Engraved.
    ${ }^{2}$ Tiny.

[^49]:    ${ }^{1}$ See P. Z. S. 1876 , pp. 253 and 352.

[^50]:    ${ }^{1}$ Letter from Thomas Bridges, C.M.Z.S., addressed to G. R. Waterhouse, containing notes on Bolivian Mammals and Birds, P. Z. S. 1846, p. 7.
    "Notes in addition to former papers on South-American Ornithology;" by Thomas Bridges, C.M.Z.S. P. Z. S. 1847, p. 28.
    ${ }^{2}$ See Mr. Pentland's paper on the Bolivian Andes, Journ. R. Geogr. Soc. v. 1. 70.
    ${ }^{3}$ See P.Z.S. 1853, p. 61. " ${ }^{4}$ Ex. Orn. p. 189, pl. xev.
    ${ }^{5}$ "Exploration of Lake Titicaca, by Alexander Agassiz and S. W. Garman. III. List of Mammals and Birds. By J. A. Allen, with Field-Notes by Mr, Garman," Bull. Mus. Comp. Zool. Haryard Coll. Cambridge, iii, p. 349.

[^51]:    ${ }^{1}$ P. Z. S. 1867, p. 598.
    ${ }^{2}$ P. Z. S. 1877, p. 124, footnote.
    ${ }^{3}$ Cf. Peters, Reise n. Mozambique, i. p. 161 ; Alston, P. Z. S. 1876, p. 83.

[^52]:    ${ }^{1}$ P. Z. S. 1877, p. 124, pl. xviii.
    ${ }^{2}$ Not greyish brown as stated by Gray.
    3 The yellowish tinge may be due to the spirit in which the specimens are preserved.

[^53]:    ${ }^{1}$ Audouin \& Milne-Edwards, Ann, Sc. Nat. xx. (1830) p. 156.

[^54]:    ${ }^{1}$ Different so far as that one is a "sense," and one a "nonsense" word, yet not so different but that Hipponoe is the French form of Hipponoa.
    ${ }_{2}$ Proc. Zool. Soc. 1855, p. 36.
    ${ }^{3}$ Valentin's 'Anatomie du genre Echinus,' p. viii of the Preface by L. Agassiz.

[^55]:    ${ }^{1}$ Vide Rev. of the Echini p. 265, Arbacia punctulata.

[^56]:    ${ }^{1}$ This is a most remarkable locality, and I suspect very strougly that it is a slip for Cayor; but even in that case the locality is one from which the species has not yet been recorded.

[^57]:    ${ }^{1}$ I add two measurements from Prof. Agassiz for the purpose of comparison; it will be seen that the second set agree very well with my results.

[^58]:    ${ }^{1}$ Principles of Geology, ii. 362 (1872).

[^59]:    ${ }^{1}$ Journ. As. Soc. Beng. (n. s.) vol. sliii. pt. 2.
    ${ }^{2}$ P. Z. S. 1864, p. 536 ; Cat. Carn. \&c. Mamm. Brit. Mus. p. 68.
    ${ }^{3}$ Linn. Syst. Nat. i. p. 92 (1788, ex Sonnerat).
    ${ }^{4}$ Nouv. Dict. d'Hist. Nat. vii. p. 169 (1817, descr. orig.).
    ${ }^{5}$ Elasmognathus dowit, Gill, Amer. Journ. Sc. 1. p. 142 (1870, descr. orig.).
    ${ }^{6}$ Elasmognathus bairdii, Gill, Proc. Acad. Philad. 1865, p. 183 (descr. orig.).
    ${ }^{7}$ Sclater, P. Z. S. 1872, p. 635, pl. li. ; List Vert. An. Zool. Soc. (1879) p. 115, no. 399 b.

    Cf. P. Z. S. 1867, p. 473.

[^60]:    ${ }^{1}$ Bell's British Quadrupeds, 2nd edit. p. 440 .

[^61]:    "B. Plumage beautifully metallic."
    a. With no portion of the underparts yellow. Throat white.
    $a^{\prime}$. Sides of the crop white. Less white on the tail ... cupreus. $b^{\prime}$. Sides of the crop golden green. More white on the tail.
    b. Portion of the underparts yellow. Throat not white ... Ilaasi.
    $a^{\prime}$. Throat yellow................................................ flavigularis.
    $b^{\prime}$. Throat metallic emerald-green........................... smaragdineus.

[^62]:    ${ }^{1}$ Since the above description was written, $I$ have received Dr. Llewellyn Powell's paper on this Spider, which is there described under the name of Desis robsoni (Trans. \& Proc. N.-Zeal. Instit. vol. xi. p. 263, pl. xii., 1879). Dr. Powell considers that it is a Desis, and identical in genus with the Spiders described (Die Arachn. Austr. l. c.) by Dr. L. Koch. I still doubt this, for the reasons given above. There appears, however, to be no reason to supersede the specific name given to this Spider by Dr. Hector (l. c. suprà).

[^63]:    Wilby Rectory, Norfolk,
    September 1879.

[^64]:    ${ }^{1}$ See Catal. Chiropt. Brit. Mus. 1878, pl. ii. fig. 2.

[^65]:    ${ }^{1}$ Op. cit. p. 12.

[^66]:    ${ }^{1}$ The Rev. O. P. Cambridge, to whom I sent a eketch of this Spider, writes that it "would seem to be near Syurma, Simon; but the thoracic region is apparently too much elevated for that genus."

[^67]:    ${ }^{1}$ Somersetshire Archæological and Natural History Society, 1851.
    2 'Zoologist,' 1861.
    3 This Museum is under Mr. Mable, to whom belongs most of the credit for its ever having been instituted. Commencing life as a shoemaker, he first set up a school for the poorest class. He also collected the materials from which the Museum has sprung, of which he is now Curator, as well as Principal of the Institution attached to it.

[^68]:    ${ }^{1}$ Trawling was resorted to on eleven days, but only on nine of them have I the numbers of each species captured.

[^69]:    ${ }^{1}$ Mr. Miers has kindly identifed the species.

[^70]:    ${ }^{1}$ Since this note was communicated to the Society, Mr. Ockenden, the Prosector's assistant, has shown me the cæcum of the type specimen of Canis rudis, Günther, from Demerara, which died in the Gardens in April last. Though not quite so small proportionally as in C. jubatus, it is also straight.
    ${ }^{2}$ P. Z.S. 1875, p. 62.

[^71]:    ${ }^{1}$ 'British Naked-eyed Medusæ,' p. 91. The supposed copy (vide Eschscholtz) of this figure by Bruguière represented, according to Forbes, another species of Medusa.
    ${ }^{2}$ Op. cit. (infrà, p. 802). Little more than a record of the occurrence of this species near Nice.
    ${ }^{3}$ Op. cit. p. 332 ; Milne-Edwards (Cuvier), pl. 55. fig. 2.
    ${ }^{4}$ Op. cit. p. 293, and pl. 25. figs. 1-3.
    ${ }^{5}$ Op. cit. p. 295, and pl. 25, figs. 4, 5.
    ${ }^{6}$ Prodr. 23; Acalèphes, p. 267, and pl. 6. fig. 6.
    7 Lesson, Cent. zool. p. $9 \overline{5}$, and pl. 33 ; Marsupialis alata, Prodr. 26 ; Acalèphes, p. 278.
    ${ }^{8}$ Op. cit. (1859), p. 3, and Taf. i., ii. $\quad{ }^{9}$ Prodr. 10; Acalèphes, p. 268.
    ${ }^{10}$ Prodr. 27: Acalèphes, p. 278. Not figured.
    ${ }^{11}$ Voy. de la Coquille, Zoophytes, p. 108; Prodr. 11 ; Acalèphes, 278.
    ${ }^{12}$ Coquille, Zoophytes, p. 108, and pl. 14. fig. 1; Acalèphes, p. 279. "Beroe gargantua, Less. Zool. Coq. pl. 15. fig. 1, seems to be only a large decayed specimen of the same species" (Agassiz, Contr. vol. iv. p. 174).

[^72]:    found at Komblon a fifth species with very peculiar genitalia. Each of these does not, as in other Charybleide, form a continuons lemina freely projecting into its lateral pouch. The genitalia are constituted rather by the modified walls of diverticula from the pouches. They form, when mature, branched arbuscules, reaching far into the interior of the disk itself and splinted by processes of its gelatinons substance. In the lumen between these processes and their investing inner membrane [eudoderm] the sexual products are developed. Semper further notes a small acaleph, likewise relate and probably charybdeoid, with very complex marginal bodies. In this connexion he declares it unnatural to insist on establishing two primary groups of discoid Medusx after the manner of Eschscholtz and his successors. Such divisious, based on single characters, arise from the delusive desire to thrust a straight-jacket of man's device upon the free creations of nature (Reisebericht, 186t).
    ${ }_{1}$ Tom. i. pars ii. (1767). Also ed. x. tom. i. p. 660 (1760).
    ${ }^{2}$ Syst. Nat. p. 3154.
    ${ }^{3}$ Whose work I have not seen. I take this reference from Eschscholtz.
    ${ }^{4}$ Hist. nat. des animaux sans rertëbres, tome ii. p. 446 (1816).
    ${ }^{5}$ Le Règne animal, tome iv. p. 59. "Lorsque ces animaux si simples prennent plus de concavité, leur surface inférieure devient intérienre, et peut être regardée comme un véritable estomac. Ce sont les Carybdées, Pér. Ceux où loon ne voit à l'intérieur aucunes traces de vaisseaux, ne diffèrent proprement des hydres que par la grandeur." 1817.
    ${ }^{6}$ Handbuch der Zoologie, erste Abtheilung, p. 111 (1820).
    7 Handbuch der Naturgeschichte der skelettlosen ungegliederten Thiere, p. 500 (1820).
    ${ }^{8}$ Histoire naturelle des Zooploytes ou Animaux Rayonnés, faisant suite à l'Histoire naturelle des Vers de Bruguière; par MIM. Lamouroux, Bory do SaintVincent et Eud. Deslongchamps, tome ii. p. 165 (1824).
    ${ }_{10}^{9}$ Familles naturelles du règne animal, p. 540 (1825).
    ${ }^{10}$ System der Acalephen, p. 101 (1829). De Blainville carelessly states that Eschscholtz places this species in Equorea.
    ${ }_{12}^{11}$ Manuel d'Actinologie, p. 275, and Atlas, pl. xrxi. f. 1 (1834).
    ${ }^{12}$ Prodrome (1837); Histoire naturelle des Zoophytes-Acalèphes (1843).

[^73]:    ${ }^{1}$ Nogle Bemxrkninger om Medusernes systematiske Inddeling, navnlig med Hensyn sil Forbes's History of Brittish naked-eyed Medusæ. Kjöbeuhavn Vidensk. Medd. 1850, pp. 15-35. See p. 27.
    ${ }_{3}^{2}$ Zoonomische Briefe, erster Theil, p. 168 (1856).
    ${ }_{5}^{3}$ Op. cit. ('Versuch'). ${ }^{4}$ Op. cit. (1859).
    ${ }^{5}$ Op.cit. (1862).
    ${ }^{6}$ From vol. iv. of his 'Contributions to the Natural History of the United States of North America.' 'The 'Second Monograph' (vols. iii. \& iv.) is devoted to the Acalephs. Seeing the ralue and beauty of this admirably illustrated work, facile princeps among treatises on the Hydrozoa, one regrets that no living Charybdeidæ were studied by the author in person.

[^74]:    ${ }^{1}$ See Brandt, in 'Mémoires de l'Acad. Imp. des Sc. de St.-Pétersbourg,' besonders abgedruckt, p. 384, and Taf. xxix., xxx. (1838).
    ${ }_{2}$ Compare the remaris of Agassiz (Contr. iv. p. 173), and consult the original figure.

    3 This singular and but litile understood form undoubtedly constitutes a distinct genus, for which Fritz Müller's name is the best. The species might henceforth be cited as Periphylla péronii (or P. charybdeoides).
    ${ }^{4}$ Natural-History Review, July, 1863 , p. 350 and context.
    5 Handbuch der Zoologie, ii. p. 548 (1863).
    6 Zoologie, i, p. 232 (1871).
    7 Illustrated Catalogue of the North-American Acalephæ, p. 55 (1865).
    8 Whose Russian memoir I have not seen. I refer, therefore, to Leuckart's 'Bericht' for 1870-71, p. 163 (1874).
    ${ }^{9}$ Generelle Morphologie der Organismen, Bd. ii. p. lix.
    10 Equivalent to Haplostomere with Trachynemidæ of Alex. Agassiz.
    11 Sitzungsberichte der Jenaischen Gesellschaft für Medicin und Naturwissenschaft, für das Jahr 1878. Published in 1879. Haeckel's "System" was communicated on 26 th July ( pp . Ixxpiii-Ixxx).

[^75]:    ${ }^{1}$ Studien über Polypen und Quallen der Adria. I. Acalephen (Discome dusen), 1877. Reprinted from 'Wiener Denkschriften,' Band xxxviii. Seo pp. 53-60.
    ${ }_{2}$ Grundzüge der Zoologie, 4te Auflage, Band i. erste Lieferung, pp. 287-289 (1879, but issued in 1878).

[^76]:    ${ }^{1}$ Cf. suprà, p. 666.

