

the plumage is as follows. Bill dusky above, fleshy yellow along edge of upper mandible, as is also the lower mandible, except the tip, which is dusky; legs and feet dingy yellow; iris brown, as in the adult. A black spot immediately in front of eye; lores and forehead cinereous grey, becoming darker on the vertex; nape and behind eye blackish, edged, except on the latter part, with tawny fulvous; hind neck, scapulars, and tertials yellowish tawny, with broad blackish oval marks, inside which the centre of the feather is dusky; wing-coverts slate-grey, the median edged fulvous buff with an adjacent blackish border. Quills dark silver-grey, the first two darker on the inner webs (probably the young of *b*); tail pale slate-grey, tipped broadly with tawny yellow, with an adjacent black cross ray; beneath white. At this stage the wing measured 4.5 inches, and the tail was short and rounded. This example was shot on the 1st July. By the 13th there were numbers of well-grown birds about, with a wing of 6.2 inches, the bill measuring at that time 0.9 inch at front; the tarsi and feet were then dusky yellow, with the joints and outer edge of webs brownish. The bill was brownish yellow above, with the gape and base of lower mandible dingy yellow. The grey of the lores and forehead and the black of the nape had deepened, the vertex was less edged with fulvous than the above-described nestling; the back and scapulars were much the same, except that the tawny hue was leaving the centres and edges, which were both becoming whitish. On the radius the feathers were darker, as were also the quills, especially the inner webs of the first (*in the example now before me*); the outer tail-feather was white; and the remainder had an arrow-headed subterminal spot, of larger size than in the young individual.

Besides the above-mentioned species, *Hydrochelidon leucopareia*, *Gelochelidon anglicus*, and *Sterna bengalensis* were very abundant, and all in *winter plumage*. The year before I had shot an example of *G. anglicus* with the black hood in the same district as early as the 18th of March. It is very abundant in this part of the island; and last month, among numbers of winter-plumaged birds, I now and then recognized one with the summer hood. *Sterna pelecanoides* was also common in the Hambantota district; it breeds on certain rocks off our coasts, as I am informed by Mr. Nevill.

Trincomalie, Oct. 20, 1874.

June 1, 1875.

Dr. Günther, F.R.S., V.P., in the Chair.

Mr. Sclater made some remarks on the most noticeable objects he had seen during a recent visit to the Zoological Gardens of Rotterdam, the Hague, Amsterdam, Antwerp, and Ghent.

At Rotterdam the specimen of *Cryptoprocta ferox*, observed on the occasion of his previous visit in 1873*, was still alive and

* See P. Z. S. 1873, p. 473.

in fine condition. Besides the adult *Casuarius westermanni**, a second, younger, example of the same Cassowary was in the collection.

In the gardens belonging to the Society "Natura Artis Magistra" at Amsterdam, the series of Pheasants and Cranes had attracted his special attention. Amongst the former were several fine pairs of *Euplocamus vieilloti*† and *E. nobilis* (of the latter of which species a pair had been obtained for the Society's collection) and a single example of *E. pyronotus* of Borneo.

Besides examples of both the common and Victoria Crowned Pigeons (*Goura coronata* and *G. victoria*), was a single specimen of what appeared to be a third form of this group, most nearly allied to *G. coronata*, but having a vinaceous red chest. Of this bird, Mr. Sclater hoped, through the kindness of Mr. Westerman, to be able to give further particulars upon a future occasion.

At Antwerp the Pheasants and Antelopes had specially attracted Mr. Sclater's attention, as had likewise three young Tiger-cubs, born in the Gardens on the 14th of October, 1873, and most successfully foster-mothered by a large bitch. Most interesting specimens were likewise a West-African *Bos brachyceros* (sive *pumilus*), and the light-coloured Eagle from the Dobrudscha, upon which the species *Aquila cullenii* had recently been established by Dr. Bree ('Birds of Europe,' 2nd edit. vol. i. p. 89).

Mr. Sclater laid on the table the typical specimen of his *Centropsar mirus* (P. Z. S. 1874, p. 176, pl. xxvi.), and made the following remarks:—

"My suspicions having been awakened as to this specimen by information received from Mr. E. Bartlett and by the criticisms of Dr. Cabanis ('Journ. für Orn.' vol. xxii. 1874, p. 458), I have made a thorough reexamination of it.

"The result arrived at is that the supposed novelty is undoubtedly composed of parts of three other birds. The head, wings, and body are those of a female or immature *Icterus*, possibly *I. auduboni*, though I have no specimen quite agreeing with it. To this have been added the worn tail of an *Agelæus gubernator* or *A. phæniceus*, and the legs of an *Otocorys*.

"*Centropsar mirus* may therefore be removed from the ornithological category. Mr. E. Bartlett tells me that there were other fictitious specimens in the same collection."

* Called *Casuarius kaupi*, P. Z. S. 1872, p. 147, pl. ix.

† Mr. Elliot, in his recent monograph of the Pheasants (plate xxvi. of vol. ii.), has united *E. vieilloti* to *E. ignitus*, considering the latter (founded on *Phasianus ignitus* of Shaw, not of Latham, as usually quoted) to be the young of the former. This I believe to be an error, as I cannot but consider the specimens of *E. ignitus* in the Leyden and British Museums to be fully adult birds. Mr. Westerman also tells me he has had an example of *E. ignitus* (Shaw) alive, and that it is decidedly distinct. Unfortunately its *patria* is not yet positively known. See my diagnosis of these three species, P. Z. S. 1863, p. 118.

Mr. Edwin Ward, F.Z.S., exhibited a pair of Hippopotamus teeth, and made the following remarks:—

“The Hippopotamus teeth sent for exhibition this evening are thought to be probably the largest that have as yet been obtained. The dimensions and weight of these two lower canine teeth are as follows:—length of each tooth from end to end round outer curve 30 and 31 inches respectively; circumference of each 9 and $9\frac{1}{4}$ inches respectively. Total weight of the pair 15 lbs.

“These specimens were obtained at St. Lucia Bay, S. Africa, in 1873, by the Hon. Charles Ellis, to whose kindness I am indebted for being enabled to show them to the Meeting.”

The following papers were read:—

1. On the Genus *Chalinolobus*, with descriptions of new or little-known Species. By G. E. DOBSON, M.A., M.B., F.L.S., &c.

[Received April 23, 1875.]

The genus *Chalinolobus* was formed by Dr. Peters for the reception of *Vespertilio tuberculatus* from New Zealand, discovered by Forster about 1773, and described in his MSS., which were not published till 1844*. This species was redescribed by Mr. R. F. Tomes in 1857† as *Scotophilus tuberculatus*; but, although his description occupies three pages, it is doubtful whether it would be possible to recognize the species from it; for some of the most important characters, as the lobes of the lower lip and the large post-calcanear lobes, have not been noticed, and the dentition has been incorrectly described.

While examining some stuffed specimens and skins in the British-Museum collection from South Australia and Tasmania, which had been labelled “*Miniopterus australis*” and “*Scotophilus morio*, Gray,” corresponding to the same names in the ‘List of Mammalia in the British Museum, 1843,’ I observed that their dentition corresponded in all respects with this species from New Zealand; and repeated examinations and careful measurements have shown that they differ in no respect from it.

This is especially interesting; for *Chalinolobus tuberculatus* has hitherto been reported from New Zealand only, and was believed to be peculiar to that island. The occurrence of this species in Tasmania and South Australia, however, is not very surprising; for New Zealand is not more distant from Tasmania than the Azores from the coast of Portugal, and *Vesperugo leisleri* of Europe is certainly also found in the Azores.

The discovery of *Chalinolobus tuberculatus* in these dried specimens led me to suspect that other species from Australia and Tasmania described from skins might belong to the same group also;

* ‘Descriptiones animalium in itinere ad maris australis terras per annos 1772-74,’ &c., p. 62 (1844), ed. Lichtenstein.

† P. Z. S. 1857, pp. 135-138.

and the same peculiarities of dentition occurring in *Scotophilus gouldii*, Gray, and in *S. nigrogriseus*, Gould, the relationship of these species with *Chalinolobus* was determined. By softening the dried integuments and by taking careful measurements of the bones remaining in the skins, I was enabled to determine that certain unnamed specimens in the collection, preserved in alcohol, belonged to the same species respectively, and in them the characteristic lobes of the lower lip were found well developed.

Scotophilus poensis, Gray, from Fernando Po, was, in the same manner, found to belong to this group; also *S. variegatus*, Tomes, and a new species, which will be described, from the Cameroon Mountains.

The number of species of this genus is thus raised from one to six; and the genus may be defined as follows:—

Genus CHALINOLOBUS.

Chalinolobus, Peters, Monatsber. Akad. Wissensch. Berlin, 1866, p. 679, and 1867, p. 480 (note).

Muzzle broad, generally very short and obtuse; nostrils opening sublaterally, forming a prominent flattened central ridge on the upper surface of the muzzle, separated from the well-developed glandular prominences by a distinct groove on either side. Ears short and broad, rhomboidal or ovoid; the outer margin prolonged forwards towards the angle of the mouth; tragus expanded above and curved inwards. *Lower lip with a distinct fleshy lobule* placed near the angle of the mouth and projecting horizontally outwards. Wings to the base of the toes; tail generally nearly as long as the head and body.

Dentition.—Inc. $\frac{2-2}{6}$; C. $\frac{1-1}{1-1}$; Pm. $\frac{2-2}{2-2}$ or $\frac{1-1}{2-2}$; M. $\frac{3-3}{3-3}$.

Upper incisors unequal; the inner incisors on each side long and unicuspidate; outer incisors short, scarcely equalling in vertical extent the cingulum of the inner incisors: in species having two upper premolars the first is very small, placed in the inner angle between the canine and closely approximated second premolar, and visible only with the aid of a lens.

This genus closely resembles *Vesperugo* in general characters, but is readily distinguished by the lobe projecting from the lower lip on either side near the angle of the mouth, by the unicuspidate upper inner incisors, by the remarkable obtuseness of the muzzle and shortness of the head, by the prominent nostrils separated by distinct grooves from the well-defined glandular elevations, and in most species by the peculiarly thin membranes traversed by remarkably distinct reticulations and parallel lines.

The form of the ear-conch and tragus, the short broad muzzle, the long tail generally wholly contained within the wing-membrane, and the shortness of the first phalanx of the longest finger, in some species, connect it with *Miniopterus*.

Distribution.—Continents of the Old World south of the equator—

Australia, Tasmania, New Zealand, and Equatorial and Southern Africa.

This genus may be considered intermediate between *Vesperugo* and *Miniopterus*, though it is evidently more closely allied to the former, and may be similarly divided into subgenera. These subgenera, however, similarly artificially based upon the presence or absence of the minute first upper premolar, separate the species into two very natural groups distinguished by other more important characters and inhabiting respectively a great continent.

Synopsis of Subgenera and Species.

- I. Premolars $\frac{2-2}{2-2}$, first upper premolar minute; fur generally dark, black or dark brown; head and shoulders darker than the posterior parts of the body; integuments dark... *Chalinolobus*.
Hab. Australia, Tasmania, and New Zealand.
- a. Internal basal lobe of the ear not forming a distinct lobule at the base projecting backwards..... *C. tuberculatus*.
 b. Internal basal lobe forming a distinct lobule at the base projecting backwards.
 a'. Outer margin of the ear terminating in front in a pendent lobule; forearm 1"·8 in adults..... *C. gouldii*.
 b'. Outer margin of the ear terminating in a horizontal lobule; forearm 1"·35 in adults *C. nigrogriseus*.
- II. Premolars $\frac{1-1}{2-2}$, the single upper premolar large, close to the canine; fur generally light grey or cream-colour at the extremities; head and shoulders lighter than the posterior parts of the body; integuments white or light brown ... *Glauconycteris*.
Hab. Southern and Equatorial Africa.
- c. Internal basal lobe of the ear commencing in a long narrow lobule projecting backwards.
 c'. A distinct postcalcaral lobule *G. poensis*.
 d'. No postcalcaral lobule; lower incisors not crowded... *G. argentatus*.
 d. Internal basal lobe of the ear commencing in a short blunt lobule.
 e'. No postcalcaral lobule; lower incisors crowded *G. variegatus*.

In the species included under the first section (subgenus *Chalinolobus*) the tragus reaches its greatest width above the middle of the inner margin, as in *Vesperugo noctula*; and there is either no lobule near the base of the outer margin, or its position is occupied by a slight convexity. In the species included under the second section (subgenus *Glauconycteris*) there is a distinct, acutely pointed, triangular lobule near the base of the outer margin of the tragus, which reaches its greatest width about the middle of the inner margin.

CHALINOLOBUS GOULDI.

Scotophilus gouldii, Gray, Appendix to Grey's Journ. of two Expeditions of Discovery in Australia, p. 405.

Head short, crown of the head very slightly raised above the face-line: muzzle broad, obtuse; glandular prominences on the sides much developed, adding to the breadth of the muzzle in front; nostrils prominent above, separated on each side by a small sulcus from the

glandular prominences. Ears similar in general outline to those of *Miniopterus schreibersii*; inner margin of the ear very convex forwards in lower half, then sloping almost horizontally backwards to the tip, the position of which is determined only by a slight flattening of the upper third of the outer margin; the lower two thirds of the outer margin is slightly convex, and terminates in a conspicuous lappet of skin hanging vertically downwards, placed at a short distance behind the angle of the mouth. Tragus broad above, reaching its greatest breadth above the middle of the inner margin; the outer margin has a slight convexity near the base, above it a concavity from which the tragus expands considerably outwards, so that the superior part of the outer margin nearly equals the whole inner margin in length: the inner margin is straight or slightly concave. Lower lip with a distinct fleshy lobe, as in *C. tuberculatus*.

Feet small; wings to the base of the toes; postcalcaral lobe rounded, well developed, at a distance equal to the breadth of the foot from the end of the tibia; extreme tip of the tail projecting.

On the upper surface the fur extends upon the wing-membrane as far as a line drawn from the middle of the humerus to the knee, and the base of the interfemoral is occupied by a triangular patch of moderately long hairs. Beneath, the hair extends more densely somewhat beyond a line drawn from the elbow to the knee-joint, a few hairs passing outwards behind the elbow and posterior to the forearm and carpus, ranged along part of the oblique parallel lines traversing the wing-membrane from the forearm backwards, as in *Vesperugo noctula*. This band of hairs posterior to the forearm is found in almost every species of this genus.

On the upper surface the fur covering the head, neck, and shoulders is black, with a very faint reddish tinge; posterior to the point of origin of the antebrachial membrane the fur is dark at the base, the terminal half of the hairs yellowish brown, at the base of the tail and upon the interfemoral membrane yellowish brown throughout. Beneath, on the breast, the bases of the hairs dark, the terminal half reddish or ashy, on the abdomen the extremities of the hairs yellowish white, while on the sides of the body and on the wing- and interfemoral membranes the fur is pale yellowish white throughout.

Inner incisors unicuspidate and long: outer incisors very short, close to the outer and anterior sides of the bases of the inner incisors. Lower incisors trifid, crowded. First upper premolar exceedingly small, so minute as to be seen only with the aid of a lens, wedged in between the inner parts of the contiguous edges of the bases of the canine and second premolar, as in *V. noctula*; the second premolar is closely approximated externally to the canine, and the minute first premolar cannot be seen from without. The first lower premolar equals half the second in vertical extent.

Length (of an adult ♀ preserved in alcohol): head and body 2''·4; tail 2''·2; head 0''·75; ear 0''·6 × 0''·45, tragus 0''·28 ×

0".15; forearm 1".8; thumb 0".3; second finger 3".3; fourth finger 2".15; tibia 0".75; foot and claws 0".35*.

Hab. New South Wales; Tasmania.

CHALINOLOBUS NIGROGRISEUS.

Scotophilus nigrogriseus, Gould, Mamm. of Australia, vol. iii. pl. 44.

Head short, slightly elevated above the face-line; muzzle broad, shortly conical; nostrils prominent on the upper surface of the muzzle, projecting slightly by their inner margins in front, opening sublaterally, emarginate between, and closer together than in other species of this genus. Ears very rhomboidal in outline; the outer and upper angle, forming the tip, rounded off; the lower half of the outer margin slightly reflected backwards at the edge; emarginate opposite the base of the tragus, and terminating in a distinct rounded lobe close to the angle of the mouth, not hanging vertically downwards at its termination as in *C. gouldi*; tragus expanded outwards above, reaching its greatest width above the middle of the inner margin, the breadth of the summit equal to the length of the inner margin, which is straight or slightly concave. On the whole, the form of the tragus is very similar to that of *C. gouldi*.

Wings to the base of the toes; postcalcanear lobe rounded, well developed, about the breadth of the foot from the tibia; last rudimentary joint of tail free.

Above deep black, the tips with a slight brownish or greyish tinge; beneath similar, the tips ashy and generally of a lighter shade on the pubes and along the sides of the body.

Distribution of the fur and dentition quite similar to those in *C. gouldi*.

Length (of an adult ♂ preserved in alcohol): head and body 1".75; tail 1".35; head 0".55; ear 0".5, tragus 0".2 × 0".12; forearm 1".35; thumb 0".28; second finger 2".6; fourth finger 1".7; tibia 0".55; foot and claws 0".28.

Hab. Australia, northern and eastern coasts, Port Essington, Moreton Bay.

CHALINOLOBUS ARGENTATUS, n. sp.

The crown of the head is abruptly elevated above the face-line as in *Miniopterus*, but to a much less extent; muzzle short, very obtuse in front, broad and flattened above; nasal apertures wide apart in front, separated by a slightly concave space, opening sublaterally, bounded laterally by the front margins of the labial glandular prominences which are separated from the nostrils above by a sulcus on each side, as in the other species of this genus. Beneath, on each side of the chin, below the under lip, a smooth broad rounded elevation exists separated from its fellow of the opposite side by the

* The original description of this species scarcely occupies two lines, and applies equally well to at least twenty different species; and the fact that all subsequent descriptions have been based on this and on the imagination of the describer, and were not derived from an examination of the types, will explain my reasons for giving so lengthened a description.

small naked space on the lip in front of the lower incisors. These elevated sides of the chin are covered with short hairs and enclose a hollow space between. Ears very like those in *Miniopterus*, short and rather sloped backwards; the inner margin commences in a long lobule directed backwards; the margin of the ear is almost regularly convex all round from the commencement of the inner margin to a point in the outer margin opposite the base of the tragus, where it becomes slightly emarginated, and immediately beyond abruptly convex, forming a short erect lobe connected by a low band with a wart in front at the angle of the mouth, which is continuous with a horizontal lappet of thickened skin extending forwards along the lower lip almost as far as a point opposite the lower canine. With this lappet of the lower lip the outer margin of the ear is thus directly continuous. Tragus semilunate, the inner margin slightly concave, the outer regularly convex, at the base a rather large equilateral triangular lobule very acutely pointed.

First phalanx of longest finger short, intermediate in length between that of *Miniopterus* and that of *Vesperugo*, terminal phalanx very long, flexed forwards on the under surface of the first phalanx in repose; in this position it extends nearly to the middle of the metacarpal bone. Feet small; wings to the base of the toes; calcaneum long and straight, extending quite three fourths the distance between the ankle and the tip of the tail; no postcalcaneal lobule.

Tail as long as the head and body, wholly contained within the interfemoral membrane.

The ears and the face are nearly naked, a few short hairs only appearing on the glandular prominences between the eyes and nostrils; the fur of the body above and beneath extends upon the wing-membranes as far as a line drawn from the middle of the humerus to the middle of the femur; the interfemoral membrane above and beneath is quite naked, except where a small triangular patch of hair appears at the root of the tail.

The fur is tricoloured, the basal third of the hairs black, the middle third white, and the terminal third a beautiful dark silvery grey. This is the arrangement of the colours about the middle of the body; but the grey is more prevalent towards and on the head, while the dark shades prevail slightly over the grey towards the tail.

The integument of the ears and face pearly white; wing- and interfemoral membranes dusky white, translucent, traversed by well-defined reticulations and parallel lines.

The teeth are very peculiar. The inner upper incisors very long, remarkably slender and acute; the outer incisor on each side fills up the space between the inner incisor and the canine by its broad base; but its unicuspidate vertically directed summit is very short, and scarcely exceeds the cingulum of the inner incisor. The canines are extremely long and slender, and are directed almost vertically downwards and slightly outwards; the lower canines are also very slender, but scarcely more than half the length of the upper ones. The upper premolar is very acute and close to the canine;

the posterior upper molar little more than half the size of the second molar. The lower incisors are distinctly trifid, some even appearing to have a fourth lobe; they are not crowded, and form a regular semi-circle across the wide space between the canines. The lower premolars are also, like the canines, very slender and acutely pointed, the first premolar about half the size of the second.

Length (of an adult ♀ preserved in alcohol): head and body 2''·0; tail 2''·0; head 0''·55; ear 0''·5, tragus 0''·22 × 0''·1; forearm 1''·7; thumb 0''·25; first finger 1''·7; second finger—metacarp. 1''·7, 1st ph. 3''·6, 2nd ph. 1''·3; third finger—metacarp. 1''·55, 1st ph. 0''·45, 2nd ph. 0''·5; fourth finger—metacarp. 1''·35, 1st ph. 0''·4, 2nd ph. 0''·3; tibia 0''·72; foot and claws 0''·3.

Hab. Cameroon Mountains, western equatorial Africa.

This species has a general resemblance to *Miniopteris schreibersi* in the shape of the head and ears, in the shortness of the first phalanx and great length of the terminal phalanx of the longest finger, in the long and slender tail wholly contained within the interfemoral membrane; added to which the grey colour of the fur and corresponding size would cause specimens of this species to be readily confounded, on a superficial examination, with specimens of the European grey-coloured *M. schreibersi*.

CHALINOLOBUS POENSIS.

Kerivoula poensis, Gray, Ann. Mag. Nat. Hist. vol. x. p. 258 (1842).

Ears very similar to those of *C. argentatus*; inner and outer margins convex, without a distinct tip, the outer margin forming a convex lobe in front of the base of the tragus, and terminating close to the angle of the mouth, the internal basal lobe forming a narrow lobule projecting backwards. Tragus similarly semilunate, even more curved inwards; the outer margin to the lip forming an arc nearly equal to two thirds of the circumference of a circle; the inner margin slightly concave; immediately above the base of the outer margin a prominent, acutely pointed, triangular lobule. So far as can be perceived from an examination of the dilapidated specimen which forms the type of this species, the lower lip has a horizontal lobe extending from the angle of the mouth to a point opposite the lower canine tooth, as in *C. argentatus*. Nostrils wide apart, separated by a slightly concave space nearly one tenth of an inch wide, and opening almost directly laterally.

Thumbs and feet as in *C. argentatus*, and similarly black at the extremities, with black claws. Postcalcaneal lobe long and narrow, triangular, the apex of the triangle (which is placed about the middle of the lobe) supported by a small cartilaginous projection placed at right angles to the calcaneum. The tail appears to be wholly contained within the interfemoral membrane.

Fur above dark at the base of the hairs, the extremities grey on the head and neck, and grey with a yellowish tinge on the back and sides; beneath similarly dark at the base, with greyish yellow extremities.

The fur of the body extends upon the wing-membrane as far as a

line drawn from the middle of the humerus to the middle of the femur, and upon the interfemoral triangularly as far as the end of the third caudal vertebra. Beneath, the wing-membrane is covered as far as a line drawn from the elbow to the knee-joint, and a few thinly spread hairs are ranged in short parallel rows on the membrane posterior to the elbow and forearm.

Teeth similar to those of *C. argentatus*, but not so slender, and the upper incisors are more inclined inwards and have the small projection on their outward sides near their extremities.

Length (total) about 3 inches, of which the tail appears to measure half; ear 0''·4, tragus 0''·16 × 0''·08; forearm 1''·5; thumb 0''·23; second finger—metacarp. 1''·5, 1st ph. 0''·5, 2nd ph. 1''·0; third finger—metacarp. 1''·4, 1st. ph. 0''·35, 2nd ph. 0''·45; fourth finger—metacarp. 1''·25, 1st ph. 0''·3, 2nd ph. 0''·3; tibia 0''·63; foot and claws 0''·28.

Hab. Fernando-Po Island, west coast of Africa.

This species resembles *C. argentatus*, but is at once distinguished by the presence of a postcalcanal lobe, and by its smaller size.

CHALINOLOBUS VARIEGATUS.

Scotophilus variegatus, Tomes, P. Z. S. 1861, p. 36*.

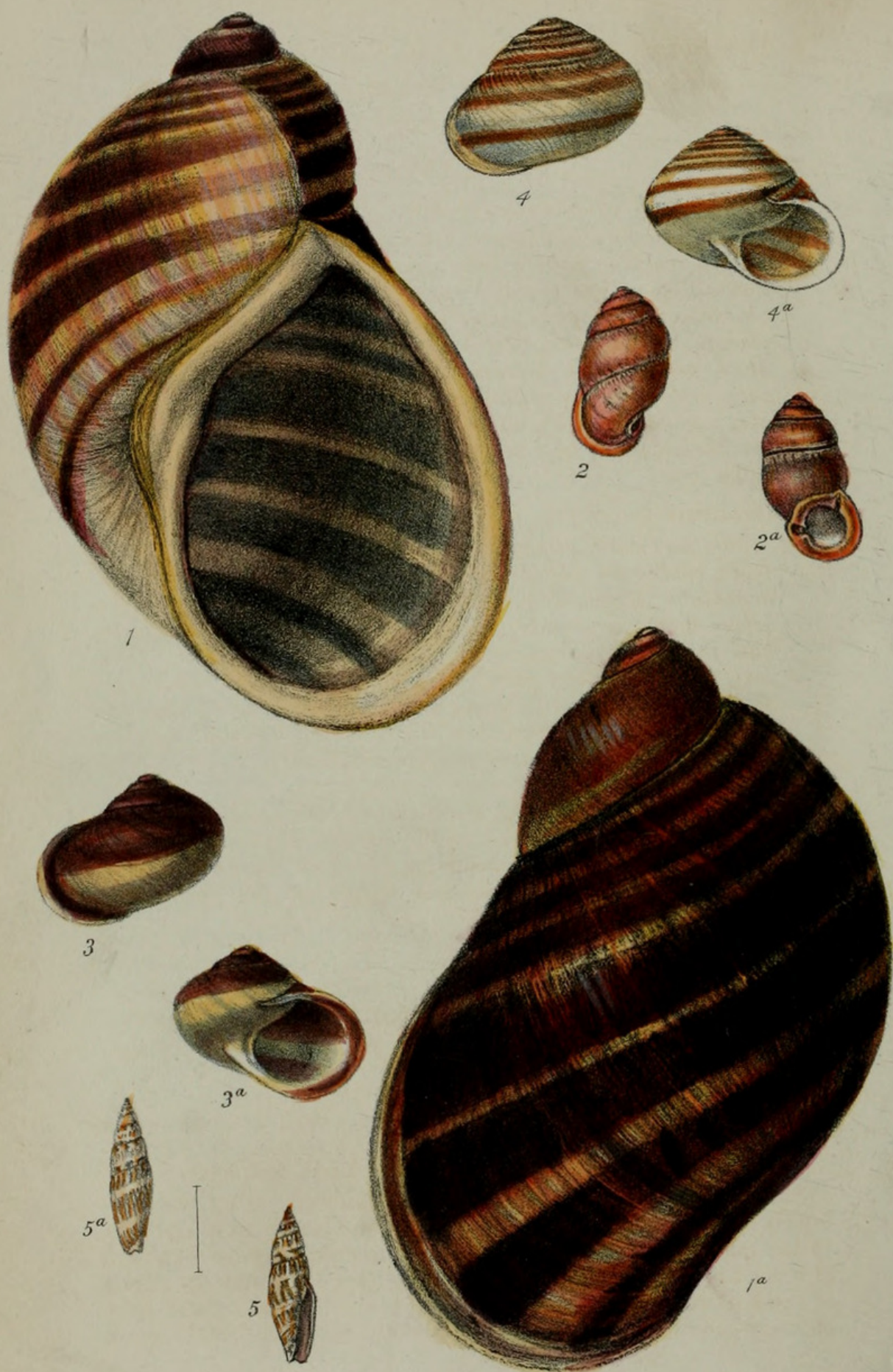
Closely allied to *C. argentatus*, which it resembles in general form, in size, and in the colour of the fur. It is, however, readily distinguished by the shortness of the lobule at the base of the inner side of the ear-conch, and by the lower incisors, which are crowded between the canines and placed at right angles to the direction of the jaw. The teeth are similar to those of *C. poensis*, not slender and extremely acute as in *C. argentatus*; and this condition is present in immature specimens also, so that the comparative bluntness of the teeth is not due to age. The head is also longer, the ears larger, and the face is covered with hair to within a short distance from the end of the nose. The lobes of the lower lip are smaller, and the under surface of the lower jaw not raised on the sides as in *C. argentatus*.

The calcaneum is quite similar to that of *C. argentatus*; and there is no postcalcanal lobe. I have examined the type specimen of this species, and find that the postcalcanal lobe described by Tomes has been produced by distortion in drying.

Length (of a ♂ preserved in alcohol) 1''·9; tail 1''·8; head 0''·65; ear 0''·6, tragus 0''·22; forearm 1''·55; thumb 0''·3; 2nd finger—metacarp. 1''·4, 1st ph. 0''·6, 2nd ph. 1''·0; 4th finger—metacarp. 1''·3, 1st ph. 0''·3, 2nd ph. 0''·3; tibia 0''·7; foot and claws 0''·3.

Hab. Otjoro, S.W. Africa.

* The type of this species from Mr. Tomes's collection (and also a duplicate in alcohol) is preserved in the Berlin Museum, which I have lately visited; and Prof. Peters has most kindly afforded me every opportunity for examining the invaluable collection of Chiroptera, which has been brought together from all parts of the world by his unwearied exertions.



G. Sowerby lith.

M & N. Hanhart imp.

NEW SHELLS FROM MADAGASCAR AND AUSTRALASIA.

2. Descriptions of Two new Land-Shells from Madagascar and New Guinea. By HENRY ADAMS, F.L.S.

[Received April 27, 1875.]

(Plate XLV.)

EURYCRATERA FARAFANGA, sp. nov. (Plate XLV. figs. 1, 1a.)

E. testa imperforata, depresso-ovata, solida, rugis obliquis irregularibus sculpta, pallide fulva, fasciis plurimis rufo-castaneis, nonnullisque latis ornata; spira brevi, subconoidea; anfr. 4, convexiusculis, rapide accrescentibus, ultimo inflato; apertura obliqua, ampla, ovali, intus margaritacea, fasciis perlucentibus; perist. albo, incrassato, breviter expanso, marginibus callo crasso junctis, columellari dilatato.

Diam. maj. 60, min. 45, alt. 50 mill.

Hab. Madagascar; on a sandy plain in the south-west, near the Farafanga river.

PUPINOPSIS ANGASI, sp. nov. (Plate XLV. figs. 2, 2a.)

P. testa perforata, pupæformi, solida, rugoso-malleata, non nitente, rubida vel pallide fulva; spira medio tumida, in conum depressum terminata; anfr. 7, superis convexis, penultimo latere aperturæ planato, ultimo angustiore, antice descendente, basi juxta perforationem cristato; apertura verticali, circulari, bicanaliculata; perist. incrassato, flavido vel albido, reflexo, margine dextro sursum producto, canali levi a parietali separato, margine columellari medio inciso, canalem apertum extus dilatatum callo circumvallatum formante.

Long. 20, diam. 12 mill.

Hab. Louisiade archipelago, south-east of New Guinea.

This species is closely allied to *P. grandis*, Forbes, but differs from it in being very much smaller, in having a narrow umbilicus or perforation, and in the first four whorls of the spire being more depressed.

3. Descriptions of Three new Species of Shells from Australia.

By GEORGE FRENCH ANGAS, Corr. Mem. Z.S., F.L.S., &c.

[Received April 27, 1875.]

(Plate XLV.)

1. *HELIX FORRESTIANA*, n. sp. (Plate XLV. figs. 3, 3a.).

Shell narrowly perforate, globosely trochiform, rather thin, obliquely striated, very finely transversely granulated; from the apex to the middle of the last whorl fulvous chestnut, with an indication of a band of a lighter colour between the periphery and the suture of the last whorl, below the periphery pale yellowish brown; spire obtusely conical; whorls 5, slightly convex, the last rather inflated,

descending in front, a little contracted behind the aperture; aperture very oblique, ovate, purplish brown within; peristome not thickened, widely expanded, the margins approximating, joined by a thin callus; the right margin slightly flexuous, brown; the columellar margin white, dilated and reflexed, nearly concealing the perforation.

Diam. maj. 10, min. 7, alt. 7 lines.

Hab. North-west Australia.

This shell differs from the other Australian *Helices* to which it is allied, in having the outer lip thin and very widely expanded. I have named it after Mr. John Forrest, whose recent explorations in Western and Central Australia have added to our knowledge of a hitherto unknown portion of that island continent.

2. *HELIX BROUGHAMI*, n. sp. (Plate XLV. figs. 4, 4a.)

Shell narrowly perforate, conically globose, rather thin, obliquely striated and obscurely minutely granulated, very pale brown above, white below, with three narrow reddish brown bands—one at the suture, one above, and one below the periphery of the last whorl; spire obtusely and depressedly conical; whorls $5\frac{1}{2}$, slightly convex, the last rounded, descending in front; aperture oblique, circularly lunate; peristome slightly expanded and reflexed, the margins approximating, the columellar margin almost straight, dilated above, and nearly covering the perforation.

Diam. maj. 12, min. 10, alt. 10 lines.

Hab. Port Lincoln, South Australia.

Allied to *H. cassandra*, Pfr., but differs in having the spire considerably more elevated, and in the columellar margin being straightened and dilated and reflexed, nearly concealing the perforation.

3. *EURYTA BRAZIERI*, n. sp. (Plate XLV. figs. 5, 5a.)

Shell somewhat narrowly fusiform, the spire a little longer than the aperture, white, shining, ornamented with three broad transverse sharply defined bands of irregular descending olive-brown lines here and there passing into blotches, the central band the broadest; apex olive-brown; whorls 7, slightly convex, longitudinally plicate, the last whorl more narrowly and finely plicate, with the interstices crossed by fine liræ, the plicæ ceasing above the central band, faintly transversely sulcate at the base; aperture narrow; columella slightly subflexuous and covered with a thin callus; outer lip simple, acute.

Long. 6, lat. $1\frac{1}{2}$ lines.

Hab. Dredged off Port-Jackson Heads, in 25 fathoms.

A prettily marked shell, quite distinct from any of the other Australian species of this genus hitherto described.

DESCRIPTION OF PLATE XLV.

Figs. 1, 1a. *Eurycratera farafanga*, p. 389.

2, 2a. *Pupinopsis angasi*, p. 389.

3, 3a. *Helix forrestiana*, p. 389.

4, 4a. *Helix broughami*, p. 390.

5, 5a. *Euryta brazieri*, p. 390.

4. Descriptions of several new Species of Indian Heterocerous Lepidoptera. By ARTHUR G. BUTLER, F.L.S., F.Z.S., &c.

[Received May 1, 1875.]

The following species have recently been added to the National Collection :—

Family SPHINGIDÆ.

Genus PANACRA.

PANACRA PERFECTA, n. sp.

Form of *P. vigil*, but pattern and coloration of *P. metallica*. Head, palpi, collar, pterygodes, and thorax above olive-brown; a lateral line on the vertex of the palpi, along each side of the head, collar, and pterygodes lilacine; a central spot on the crest, and another in the middle of the collar, of the same colour; a whitish line along the inner margins of the pterygodes; abdomen greyish brown in the centre, tinted with lilacine at the base, and with a dorsal double series of indistinct blackish spots, two on each segment; sides of the abdomen mahogany-brown, with a broad paler streak, ferruginous on the basal segments, but golden mottled with ferruginous on the posterior segments; primaries above olivaceous, varied on discoidal area with lilacine streaks, and longitudinal blackish and grey lines on the nervures; a black dot at end of cell surrounded by a lilacine zone; a piceous streak, followed by three blackish parallel oblique lines from internal margin to upper radial nervure; apical and external areas (including the central portion of the interstices between the oblique lines) buff, varied with olivaceous; an irregular discosubmarginal brown line from apex to external angle, margined by a brownish diffused streak at its extremities and between the radials (at which point the external area is dark olivaceous); an exterior submarginal line parallel to the last, but not reaching the apex; outer margin olivaceous; secondaries rosy brown, clothed at base with greyish olivaceous hairs, external area dark brown, a double submarginal ochreous streak from just beyond the third median branch to the anal angle; fringe yellow, spotted with black at the ends of the nervures: palpi below white, ferruginous at the sides; pectus bright golden, varied in front with ferruginous, and at the sides with silver scales; coxæ and trochanters sordid white, fringed with ferruginous, anterior femora and tibiæ brown, tarsi white; second pair of legs pale brown, the femora fringed above with orange, below with gold; third pair rosy whitish, the femora fringed below and the tibiæ above with golden scales; venter ferruginous, sprinkled all over with golden scales, a silvery lateral patch on the basal segments, a whitish central streak; a lateral row of black dots; primaries below with the basal half dark greyish brown, costa ochraceous; external half ochre-yellow, a broad red streak tapering from the end of the cell to the apex; the oblique lines of the upperside red, the submarginal lines blackish, with white interstitial line at

apex; secondaries grey, costa yellow, subcostal, abdominal, and disco-anal areas carmine-red: the disco-anal area mottled with yellow; three central brown lines diverging upon costa, and traversed by a waved transverse series of seven black dots upon the nervures; a golden spot in the cell; two submarginal brown lines, the inner one only extending along the margin of the discal carmine area; margin ferruginous, fringe as above; expanse of wings 2 inches 6 lines.

Darjeeling, June 1874 (*Sadler*).

Type, B.M.

Genus LEUCOPHLEBIA.

LEUCOPHLEBIA DAMASCENA, n. sp.

Allied to *L. bicolor*, altogether darker, with narrower silky ochreous streak on primaries.

♀. Head and thorax deep dull plum-colour, a dorsal ochreous thoracic streak; antennæ whity brown; abdomen greyish rose-red, with central longitudinal buff streak; segments margined behind with deep ochreous, with a whitish fringe; primaries deep plum-colour, a broad streak of silky ochreous, tapering towards base and apex, and throwing out spine-like streaks along the median branches and radials; fringe near external angle pale stramineous; secondaries deep ochreous; outer margin rosy, fringe and costal area stramineous; wings and body below nearly as in *L. bicolor*; expanse of wings 2 inches 5 lines.

Sikkim (*Whitely*).

Type, B.M.

The most richly coloured, and consequently the most beautiful species in the genus.

The two preceding species having been obtained subsequent to the reading of my papers on the Sphingidæ, I have thought it best to send them to the 'Proceedings,' as they can thus be added with greater brevity to my revision of the family.

Family LITHOSIIDÆ.

Genus AGALOPE.

AGALOPE PRIMULARIS.

Allied to *A. basalis*, but the entire ground-colour of the primaries in the male lemon-yellow, and the basal orange spot brighter; primaries of the female without the basal orange spot; the primaries yellowish, with the base and a diffused streak below the median nervure lemon-yellow; expanse of wings, ♂ 1 inch 6 lines, ♀ 1 inch 8 lines.

♂, ♀. Darjeeling, May 1874 (*Sadler*).

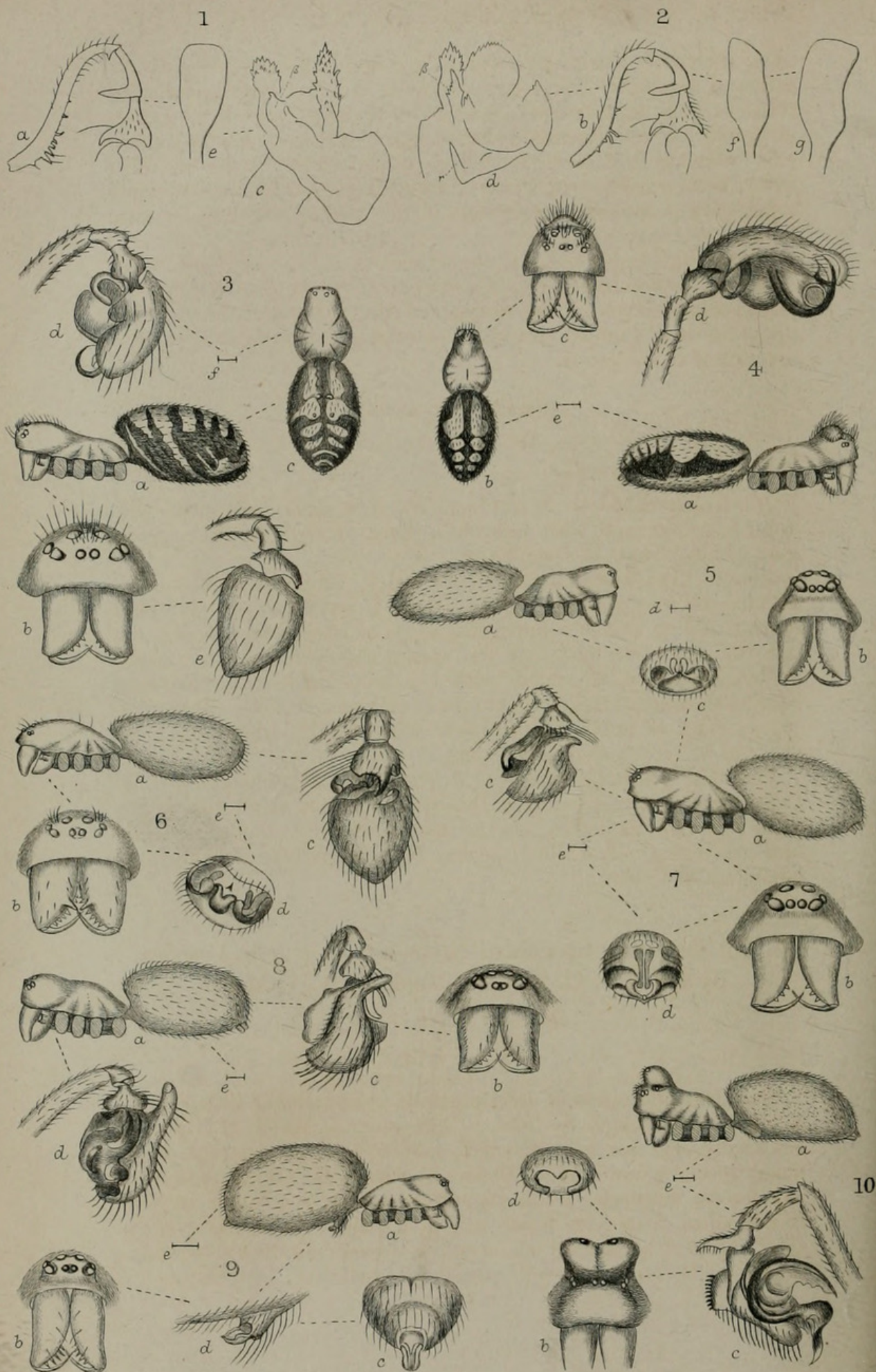
Type, B.M.

There were only two examples of this species in the fine collection recently sent home by Mr. Sadler. I believe, however, that two other examples exist in the collection of Dr. Anderson. The species is a very beautiful one.

Genus CADPHISES.

CADPHISES MOOREI, n. sp.

Wings black, with purplish reflections, the entire surface covered



O. F. Cambridge delt
A. T. Hollick lith.

W. West & Co. imp.

NEW SPECIES OF ERIGONE.
from North America.

by innumerable cream-coloured spots, which towards the base are arranged in parallel longitudinal rows, about seven in primaries, and six to seven in secondaries; body greenish black; the head, collar, pterygodes, and thorax spotted with silvery white; abdomen spotted with white at the base and sides; palpi and pectus spotted with white, basal segments of venter margined with white, anal segments covered by a wax-like testaceous plate; expanse of wings 3 inches 5 lines.

Darjeeling (*Sadler*).

Type, B.M.

Easily distinguished from *C. maculata* by its greater size, the more purplish colour of the wings, and the absence of the ochreous colouring on abdominal area of secondaries. I have named it after the author of the genus.

Family LIPARIDÆ.

Genus DREATA.

DREATA TRISERIATA, n. sp.

♂. Nearly allied to *D. subcurvifera*, but larger, altogether yellower in colour, and with scarcely a trace of the two submarginal rows of black spots in secondaries.

Above, head and thorax densely hairy, bright straw-coloured; antennæ brown; primaries straw-coloured, with a subcostal, a bent central, and an arched submarginal series of larger black spots, the last two series meeting near the apex; abdomen and secondaries golden testaceous, the latter with two indistinct disco-submarginal parallel squamose blackish lines: body and wings below sordid ochraceous; sides of pectus and fringe of wings bright stramineous; expanse of wings 2 inches 6 to 9 lines.

Pulni Hills, S. India 8000 feet (*A. F. Sealy*). Five examples, B.M.

Mr. Sealy informs me that this species is not at all rare, and is easily captured, as it flies into the house; all the examples taken by him are males. The allied species, *D. subcurvifera*, Walker, is an inhabitant of Ceylon.

5. On some new Species of *Erigone* from North America.

By the Rev. O. P. CAMBRIDGE, M.A., C.M.Z.S.

[Received May 4, 1875.]

(Plate XLVI.)

Since the publication of descriptions of new species of *Erigone* from North America (P. Z. S. 1874, p. 428, pl. lv.), Mr. J. H. Emerton has kindly sent me another small collection, containing nine additional species; one only of these (*E. viaria*, Bl.) is identical with any known European form, though several of the others are very closely allied to species found in England and France. One of the chief points of interest attaching to the present collection is in regard to two of the species (*E. ornata* and *E. pictilis*): in these an un-

usual character is furnished in the very distinct and strongly marked pattern on the upperside of the abdomen; very few European species, discovered hitherto, present any thing like a regular pattern, while the majority have a merely unicolorous abdomen.

I take this opportunity of again returning my kind thanks to Mr. Emerton for allowing me to describe and figure portions of these very interesting little Spiders, and I also make bold to express a hope that through his exertions I may soon have the pleasure of making known other new forms of the same genus.

ERIGONE PERSIMILIS, sp. n. (Plate XLVI. fig. 1.)

Erigone atra, Cambr. P. Z. S. 1874, p. 429 (exclude synonym there quoted).

Adult male, length $1\frac{1}{3}$ line.

This Spider is very closely allied to *E. atra*, Bl. (*E. vagabunda*, Westr.), resembling it (as well as some other kindred species) in size, colours, general form, and structure. Its distinctness was overlooked *l. c. supra*; it may, however, be distinguished from that species, on a closer examination, by the caput having a median longitudinal row of three distinct tooth-like tubercles, each of which is furnished with a short bristle; the form also of the fore extremity, on the upperside of the radial joint of the palpus, differs slightly, but characteristically (see fig. 1 *e*, fig. 2 *g*, representing that of *E. atra* from a similar point of view); on the middle of the underside also of the radial joint in *E. atra* is a very slight, indeed, but perceptible, rudimentary tooth, or tubercle, while no trace of it appears to exist in the present Spider; the denticulation also of the humeral joint differs, the teeth not being so even in size or distribution as in *E. atra*; the palpal organs appear to be very similar; but probably a lens of higher power than that under which I have been able to examine them would show some important structural differences.

An adult male was received in June 1874 from Mr. J. H. Emerton, by whom it was found at Swampscott, Boston, Massachusetts, under a stone; and a comparison recently made of the present Spider with that recorded as *E. atra* (P. Z. S. 1874, p. 429) proves the two to be identical.

ERIGONE DENTIGERA, Cambr. (Plate XLVI. fig. 2.)

Erigone dentigera, Cambr. P. Z. S. 1874, p. 429.

Adult male, length $1\frac{1}{3}$ line.

This species is exceedingly nearly allied to *E. persimilis*, as well as to *E. atra* (Bl.); but it may be distinguished by its shorter legs and palpi, the cubital and radial joints of the palpus being much shorter in proportion; the latter (radial) joint has also a distinct conical tooth near the middle of its underside; the form also of the fore extremities on the upperside of this joint differs, being narrower and more pointed, though still obtuse; and the denticulation of the humeral joint differs, the teeth in the present species being fewer and blunter; the palpal organs also differ when viewed under a strong

lens; figure 2 *d* represents those of the present species, and 1 *c* those of *E. persimilis*; these two figures are taken from a sketch of each in a similar position, under a high power, by Mr. Emerton. The caput has a central longitudinal row of tuberculiform denticulations, like those of *E. persimilis*, but of a smaller size.

Mr. Emerton remarks upon the darker and peculiar colour of this Spider when compared with *E. persimilis*; but this character, as far as it has yet been ascertained, is no certain specific criterion in the Spiders of this group; a long series of two well-known species (*E. dentipalpis*, Wid., and *E. atra*, Bl.), will furnish every variety of depth of colouring.

In regard to the present species, other minor differences are observable on a careful comparison with *E. persimilis* and other, nearly allied, species. These differences will have to be carefully noted when the numerous Spiders of this group come to be monographed; but for the present purpose the differential characters detailed above and in P. Z. S. 1874, p. 429, will be found sufficient for specific determination.

An adult male was received from Mr. Emerton, by whom it was found at Troy, near Boston, Massachusetts, U. S. A.; and a comparison of it, lately made, with the example described P. Z. S. *l. c.* shows the identity of the two. The present description notices the difference from *E. persimilis* (Cambr.), while that in P. Z. S. *l. c.* differentiates it from *E. longipalpis*, Sund., and some other species.

ERIGONE ORNATA, sp. n. (Plate XLVI. fig. 3.)

Adult male, length $1\frac{1}{4}$ line.

This species is very closely allied to *Erigone pictilis* (p. 396), resembling it very nearly in the pattern on the abdomen; the darker portion of it, however, is more mottled and marked with pale yellow, and an uninterrupted oblique and slightly curved stripe traverses each side. It may also be at once recognized from *E. pictilis* by the absence of the occipital elevation; the occiput being only a very little, and uniformly, gibbous, or rounded, and, when looked at from above the caput, is less compressed laterally near its lower margins. The cephalothorax is glossy, and of a deep yellow-brown colour; and the caput has a few erect hairs on its upper part, as well as some others, directed a little backwards, on the ocular area; the height of the clypeus is half that of the facial space.

The eyes are of moderate size, and relatively not greatly different from each other; they are in the ordinary position; those of the hinder row are equidistant from each other, being separated by spaces equal to the diameter of one of the hind centrals, those of each lateral pair are obliquely placed and contiguous to each other, the fore lateral eye being larger than the hind lateral; those of the fore central pair are the smallest and darkest-coloured, near together, but not contiguous to each other, and each of them is separated from the fore lateral eye on its side by an interval equal to its diameter; the front row of eyes is much the shortest, and, looked at from above, straight.

The legs are not very long, but tolerably strong; their relative

length appears to be 4, 1, 2, 3; they are of an orange-yellow colour, and are furnished with hairs and two or three short fine spines; one of these latter, on the outer side, near the middle of the tibia of each of the fourth pair, is much less strong than the corresponding one in *E. pictilis*.

The *palpi* are short, and similar in colour to the legs; the cubital and radial joints are very short, but of about equal length, the latter being the stoutest; a single, rather upturned, slender bristle issues from the fore extremity on the upperside of the cubital joint; and the radial joint has its fore extremity, rather on the outer side, produced into a short apophysis, whose extremity is obtuse and bifid, or emarginate; the digital joint is large, and the palpal organs complex, very similar to those of *E. pictilis*, but the spines and spiny processes are not so strong.

The *falces* are tolerably strong, but not very long; they are similar to the cephalothorax in colour, and armed with fine teeth on their inner margins, towards the extremity.

The *maxillæ* and labium are slightly paler in colour than the *falces*; but their form is normal.

The *sternum* is heart-shaped, convex, and glossy, of a very deep reddish yellow-brown colour, and thickly clothed with longish hairs.

The *abdomen* is oval, and projects over the hinder slope of the cephalothorax; its colour is blackish, with a pattern similar to that on the abdomen of *E. pictilis*, differing slightly, as above observed. About the middle of the upperside are four small reddish impressed spots, forming a quadrangular figure, whose fore side is slightly shorter than the three others; the surface of the abdomen is thinly furnished with short hairs, and there are two or three rather strongly marked transverse curved folds just above the anal prominence; the spinners are very short and of a pale yellowish hue.

Two adult males of this Spider were received from Mr. J. H. Emerton, by whom they were found under leaves at Providence, Massachusetts, U. S. A., in November 1871.

ERIGONE PICTILIS, sp. n. (Plate XLVI, fig. 4.)

Adult male, length nearly $1\frac{1}{2}$ line.

The *cephalothorax* is of a yellow-brown colour, and of ordinary general form, but the caput has its occiput a little elevated, the hinder slope of the elevation, looked at in profile, rounded and gradual, while the front slope is rather abrupt, forming (in profile) with the fore part of the caput a somewhat angular hollow; the height of the clypeus, which is full, rounded, and slopes a little forward, exceeds half that of the facial space; the upper part of the caput is clothed with numerous bristly hairs directed forward, others of a similar nature occupying the ocular region and directed upwards and rather backwards.

The *eyes* are not very large, nor very unequal in size; they are placed in four pairs, or two transverse rows, of which the hinder one (looked at from the front) is strongly curved, and the foremost much the shortest and nearly straight; those of the hinder row are about

equidistant from each other, the hind centrals being each placed immediately in front of a round shining pale-coloured tubercle; those of each lateral pair have a round shining tubercle behind them, they are contiguous to each other, and obliquely placed; and from behind each of these pairs a longitudinal narrow indentation, fringed with a row of bristly hairs, runs backwards and obliquely upwards towards the hinder part of the occiput; the eyes of the fore central pair are smallest of the eight, near together, but not contiguous to each other, and each is separated from the fore lateral eye nearest to it by nearly the diameter of the latter.

The *legs* are moderate in length and strength; their relative lengths appear to be 4, 1, 2, 3; they are of a pale dull yellow colour, furnished with hairs and one or two fine black spines.

The *palpi* are short and similar in colour to the legs, except the digital joint, which is suffused with brown; the cubital and radial joints are very short; the latter is a little roundly produced at the fore extremity on its outer side, where it has a not very large pointed apophysis; the digital joint is very large, and has a strong lobe towards the fore extremity on the outer side; the palpal organs are well developed and complex, a strong black tapering spine issues from their midst, and curving round inwards, almost encircles their fore extremity, and within its curve is a smaller spine coiled in a circular form.

The *falces* are rather paler in colour than the cephalothorax; they are tolerably long and strong, a little rounded in their profile-line, and divergent towards their extremities when looked at from the front; they are furnished with a few minute teeth towards their extremities on the inner margin, and close above them three bristles in a single row directed downwards.

The *maxillæ* are of normal form, similar to the legs in colour, and furnished with some long and strong bristles towards their outer sides.

The *labium* is also of normal form, and (with the sternum, which is heart-shaped, convex, and bristly) is of a dark brown colour.

The *abdomen* is oval, tolerably convex above, and projects but very slightly over the base of the cephalothorax; almost unique hitherto among the numerous species of this genus, it has, like the foregoing species, a strong well-defined pattern on its upperside, very nearly resembling that of *Amaurobius ferox* (C. Koch); its colours are black and dull yellow, tinged (in four examples) with a slight reddish hue; and according as one or the other of these colours prevail, either may be described as the ground-colour. In the example now figured and described (Plate XLVI. fig 4), the ground-colour of the upperside is black, the fore half has two large yellowish patches on either side, followed by a series of slightly oblique spots or blotches of a similar colour, arranged in pairs, and diminishing in size as they approach the spinners; the sides are black, divided by an indistinct oblique yellowish gap; and the underside is dull yellowish, the central longitudinal line being clouded with a dusky hue. When the yellow prevails, the black forms a central longitudinal bar, from the hinder half of which a series of several oblique lateral bars issue on either

side, diminishing in length towards the spinners; the abdomen is thinly clothed with short hairs.

The *female* resembles the male in colours and markings; but the occiput wants the bristly elevation so characteristic of the male.

Adults of both sexes of this fine and very interesting Spider, found on pine and juniper trees, were received from Mr. J. H. Emerton, by whom they were captured at Beverley, Swampscott, Boston, Massachusetts, U. S. A., in May 1874.

ERIGONE PROVIDA, sp. n. (Plate XLVI. fig. 5.)

Adult female, length rather more than 1 line.

The cephalothorax, falces, and sternum of this Spider are of a rather dark yellow-brown colour; the legs are brightish orange-yellow, the palpi, maxillæ, and labium dull yellow, suffused with brown; and the abdomen blackish yellow-brown, tinged with olive.

The form of the *cephalothorax* is of the ordinary type; the profile-line from the eyes to the thoracic junction almost level, with a slight dip or hollow close behind the occiput; the normal grooves and indentations are distinctly but not very strongly marked; and the height of the clypeus, which is a little impressed just below the eyes, is equal to half that of the facial space.

The *eyes* are on black spots in the usual position, of tolerable size; and although closely grouped together, they occupy the whole width of the fore part of the caput; those of the hinder row are equidistant from each other, being separated by an interval not much, if any, greater than half the diameter of one of the central pair; those of each lateral pair (of which the foremost is the largest of the eight) are obliquely placed on a slight tubercle, and contiguous to each other; the foremost one is also contiguous (or as nearly so as possible) to the fore central eye nearest to it, the fore centrals also being contiguous to each other, and the smallest of the eight; the two pairs of lateral eyes thus form, with the fore central pair, a continuous curved line; and the interval between each of these last and the hind central eye nearest to it is equal to the diameter of the latter.

The *legs* are moderate in length and strength; their relative length appeared to be 4, 1, 2, 3; and they are furnished with hairs and slender bristles.

The *falces* are strong and of tolerable length, a little inclined towards the labium, and (as far as could be ascertained, though not with absolute certainty) armed with small teeth on the inner margin towards the extremity.

The palpi, maxillæ, labium, and sternum present no unusual or distinctive feature in form or structure.

The *abdomen* is of rather an elongate oval form, and not very convex above, nor projecting much over the base of the cephalothorax; it is of a dull greenish-black yellow-brown hue, marked (like many others) with pale lines and spots on the upperside, probably not visible except through spirit of wine; the form of the genital aperture is simple but characteristic.

Two examples of this species, which is nearly allied to *E. cornu-*

palpis, were received from Mr. Emerton, by whom they were found under leaves at Swampscott, Boston, U. S. A., in March 1874.

ERIGONE PERTINENS, sp. n. (Plate XLVI. fig. 6.)

Adult male, length very nearly $1\frac{1}{2}$ line.

The cephalothorax, falces, maxillæ, labium, and sternum of this Spider are of a yellow-brown colour, the sternum, however, being rather more suffused with brown; the colour of the legs and palpi is yellow, the digital joints of the latter yellow-brown, and the abdomen dull brownish black, with an olive hue. The *cephalothorax* is of ordinary general form; the profile line forms an almost uniform curve, of which the highest part is at the occiput; the normal indentations and grooves are not strongly marked, and the lateral constriction of the lower margins of the caput is very slight; the clypeus projects forwards, forming a continuous portion of the profile-curve, and its height equals half that of the facial space.

The *eyes* are in the ordinary position, of moderate size, and relatively not greatly different, those of the fore central pair being, as in most other species, the smallest; those of the hinder row are equidistant from each other, the intervals separating them being equal to about an eye's diameter; those of the fore central pair are near together, but not contiguous to each other, and each is slightly over its own diameter's distance from the fore lateral on its side, and is separated from the hind central nearest to it by an interval equal to the diameter of the latter; those of each lateral pair are obliquely placed and contiguous to each other, the fore one being apparently the largest of the eight.

The *legs* are not very strong, but rather long; their relative length is 4, 1, 2, 3; they are well furnished with hairs, bristles, and longish, slender, bristle-like spines.

The *palpi* are short; the radial and cubital joints are of equal length, the former is the strongest, and has a curved spine-like pointed apophysis at the middle of its fore extremity, pointing downwards, outwards, and rather backwards; the outer side of the radial joint is furnished with some long bristly hairs; the digital joint is rather large, and has a small, pointed, somewhat spine-like apophysis near its base on the inner side, its point having the same direction, and not far removed from the point of that at the extremity of the radial joint; the palpal organs are prominent and complex, with corneous and spiny processes.

The *falces* are of moderate length and strong; each is armed with a strong tooth in front on the inner side, with apparently a small tubercular prominence underneath, near its base; they are also furnished with teeth along the inner margin of the fore half.

The form of the maxillæ, labium, and sternum is normal.

The *abdomen* is oval, moderately convex above, and projects fairly over the base of the cephalothorax; it is of a dull black-brown colour, tinged with olive-green, and is pretty well clothed with longish coarse hairs.

The *female* resembles the male in form and colours; the falces,

however, are destitute of the single characteristic tooth on the inner side of their front surface; and (in spirits of wine) the abdomen is pretty distinctly marked with various lines and mottlings of dull yellow, very faintly indicated in the male; the sexual aperture is furnished with a short prominent process of a characteristic form, impossible to describe clearly, and not easy to delineate certainly; fig. 6 *d* is an attempt to represent its appearance slightly in perspective.

This species is allied to *E. livida*, Bl., as well as to *E. subtilis* (Cambr.) and others, but cannot be confused with them if the profile of the cephalothorax, the armature of the falces, and the form of the radial joint of the palpus and the palpal organs be carefully observed.

An adult of each sex was received from Mr. Emerton, by whom they were found under a stone, below high-water mark, at Peaks Island, Boston, Massachusetts, U. S. A., in August 1873.

ERIGONE PERSOLUTA, sp. n. (Plate XLVI. fig. 7.)

Adult male, length rather over 1 line.

The cephalothorax, falces, and maxillæ of this Spider are of a yellow-brown colour, the margins of the cephalothorax being blackish; the legs and palpi (except the digital joints of the latter, which are yellow-brown) are of a dull orange-yellow colour; the labium and sternum are suffused with blackish brown; and the abdomen is dull black, with a strong olive-green tinge, marked (in spirits of wine) with fine pale spots and lines.

The form of the *cephalothorax* is of the ordinary type; looked at in profile, the line from the foremost eyes to the thoracic junction is a gentle curve with a very slight hollow at the occiput; the height of the clypeus, which is a little prominent at its lower margin, rather exceeds half that of the facial space.

The *eyes* are of tolerable size, and in the usual position, on black spots, but rather closely grouped together; those of the front row are very nearly contiguous to each other; those of the hind central pair are separated by an interval not quite equal to an eye's diameter, and each is separated from the hind lateral eye on its side by an interval rather less than that which divides those of the hind central pair; those of each lateral pair are obliquely placed, contiguous to each other, and apparently the largest of the eight; each of the fore centrals is separated from the hind central eye nearest to it by a space equal to its own diameter.

The *legs* are of tolerable length and strength, their relative length being 4, 1, 2, 3; they are furnished with hairs, bristles, and a few fine spines.

The *palpi* are not very long, the radial and cubital joints very short, the former being the strongest; it is largest at its fore extremity, but has no apophysis; and among other, finer hairs it has several longer and stronger bristly ones issuing from its fore extremity, near the outer side; the cubital joint has a single slightly sinuous bristle at its fore extremity, a little towards the outer side; the digital joint

is large, and has its hinder extremity produced into a curved horn-like projection, its point being red-brown, apparently of a corneous nature, and directed outwards. The palpal organs are highly developed, prominent, and complex; two bright red-brown strong corneous processes are most noticeable, one of them curved or folded in a circular form at their base on the outer side; the other, longer and stronger, issues from their inner extremity, and, running backwards, curves round their base.

The *falces* are moderate in length and strength; they are directed backwards towards the labium, and are armed with a few minute teeth on their inner edge near the extremity.

The *maxillæ*, *labium*, and sternum are of normal form.

The *abdomen* is oval, tolerably convex above, and projects fairly over the base of the cephalothorax; it is of a greenish black colour, mottled and lined with pale yellowish (when seen through spirits of wine) and thinly clothed with hairs.

The *female* resembles the male in colours and general characters; and the genital aperture is rather complex in its form.

This species is very nearly allied to the European form, *E. conigera* (Cambr.), but may, among other characters, be easily distinguished by the less strong and more curved process at the base of the digital joint, as well as by a quite different structure of the palpal organs.

Examples of this Spider were received from Mr. Emerton, by whom they were found under leaves at Swampscott, near Boston, U. S. A., in March 1874.

ERIGONE CORNUPALPIS, sp. n. (Plate XLVI. fig. 8.)

Adult male, length $1\frac{1}{4}$ line.

The cephalothorax, *falces*, and *maxillæ* of this Spider are of a yellow-brown colour; the legs and palpi dull orange-yellow, tinged slightly with brown; the labium and sternum dark yellow-brown; and the abdomen dull blackish, tinged with olive-green.

The form of the *cephalothorax* is of the ordinary type; a very slight dip or hollow is observable in the profile-line just behind the occiput; and the normal grooves and indentations are distinct, but not strongly marked; the height of the clypeus, which slightly projects, is equal to half that of the facial space.

The *eyes* are rather large, on black spots, and closely grouped together in the usual position; those of the hinder row are separated by as nearly as possible equal intervals of half a hind central eye's diameter; those of each lateral pair are placed obliquely on a tubercle, the foremost of these pairs are the largest of the eight, and each is separated from the fore central eye on its side by an interval not much exceeding half the diameter of the latter; those of the fore central pair are smallest of the eight, very near, but not quite contiguous to each other.

The *falces* are strong and of tolerable length; they are very nearly vertical; and each appeared to have, on the outer side of its front surface, a longitudinal row of minute fine tooth-like spines; there are

also several of the ordinary teeth on the inner margin towards the extremity.

The *legs* are tolerably long and strong; their relative length appeared to be 4, 1, 2, 3; and they are furnished thinly with hairs, bristles, and a spine on each of the genual and tibial joints of those of the fourth pair.

The *palpi* are rather short, tolerably strong, similar to the legs in colour, except the digital joint, which is of a yellow-brown hue; the cubital joint is short, and has a single, strongish, sinuous, prominent, tapering bristle at the fore extremity of its upperside; the radial joint is of the same length as the cubital, but much stronger, being rather gibbous at its fore extremity almost all round, but most strongly in front, though there is no distinct apophysis; the digital joint is large, and has its hinder extremity produced into a longish and strong, tapering, but obtusely pointed, curved horn-like projection, the point directed outwards; there is also a large obtuse lobe-like prominence on the outer side, divided into two or three lesser lobes; the palpal organs are prominent and complex, a strong, somewhat folded, crescent-shaped, corneous process being placed at their base on the outer side; this process has a black, sharp-pointed, tooth-like prominence at the middle of its strongest part.

The *maxillæ*, *labium*, and *sternum* are of normal form.

The *abdomen* is oval, pretty convex above, and projects slightly over the base of the cephalothorax; it is of a dull greenish black hue, marked with pale lines and mottlings (probably not visible except in spirits of wine), and thinly clothed with hairs.

A single example was received from Mr. Emerton, by whom it was found at Brookline, Massachusetts, U. S. A., in 1870. It is very nearly allied to *Erigone retroversa* (Cambr.), a French species, but is quite distinct. It is also allied to *E. cornigera*, Bl., and *E. persoluta*, Cambr. (*ante*, p. 400).

ERIGONE MULTESIMA, n. sp. (Plate XLVI. fig. 9.)

Adult female, length $1\frac{2}{3}$ line.

The whole of the fore part of this Spider, including the legs and palpi, is of a bright orange-yellow colour, except the sternum, which is somewhat suffused with brown, and the abdomen is black.

The form of the *cephalothorax* is ordinary, and its profile-line describes a slight curve; the normal grooves and indentations are distinct, but not strongly marked; the thoracic junction is indicated by a curved blackish line, the convexity of the curve directed backwards; the clypeus is a little impressed or hollow (in profile) just below the eyes, and its height is equal to half that of the facial space.

The *eyes* are of moderate size and in the usual position, on black tubercles; those of the hinder row are equidistant from each other, the intervals being equal to the diameter of one of its central pair; the fore laterals are largest of the eight, and are, with the hind laterals, placed obliquely on a strongish tubercle; those of the fore central pair are smallest of the eight, very near, if not quite contiguous, to each other, and each is separated from the fore lateral eye

on its side by an interval equal to its own diameter, and from the hind central nearest to it by an interval equal to the diameter of one of the fore laterals.

The *legs* are tolerably long, slender, and furnished with hairs, bristles, and a few longish fine spines on those of the fourth pair; their relative length is 4, 1, 2, 3.

The *falces* are long and strong, slightly hollowed on the outer sides (when looked at from the front), and a little divergent at their extremities; they are armed on their inner edge, towards the extremities, with a double row of teeth, those of the front row rather long and strong, of the hinder row minute.

The *maxillæ* are strong, a little curved, and inclined, but not very strongly, towards the labium.

The *abdomen* is large, oval, very convex above, and projects fairly over the base of the cephalothorax; it is black, thinly clothed with fine hairs, the spiracular plates and corpus of the epigyne (which is prominent and of characteristic form) dull yellow-brown; the extremity of the genital process is bright red-brown.

A single example of this Spider, which appears to belong to the group characterized (and probably rightly) as a separate genus by Menge, under the name *Bathypantes*, was received from Mr. Emerton, by whom it was found under a stone at Brighton, Boston, U. S. A., in April 1873.

ERIGONE VIARIA.

Nerience viaria, Bl. Spid. Great Brit. & Ireland, p. 255, pl. xviii. fig. 171.

Erigone quisquiliarum, Westr. Araneæ Suecicæ, p. 277.

Adults of both sexes of this Spider were received from Mr. Emerton, by whom they were found under leaves at Brookline, Massachusetts, U. S. A., in March 1874. These examples present no variation whatever from the English and continental examples of this species.

ERIGONE FLORENS, sp. n. (Plate XLVI. fig. 10.)

Adult male, length $1\frac{1}{4}$ line.

The cephalothorax of this pretty and very distinct species, as well as the palpi, falces, maxillæ, labium, and sternum, are of a bright shining orange-yellow colour; the femora of the legs are of a similar colour, the genual, tibial, and metatarsal joints being strongly suffused with brownish black, while the tarsi are of a dusky yellowish hue, and the abdomen black. The *caput* has a large strong eminence, broader at the top (when looked at from the front) than at its junction with the caput itself, and divided into two large well-rounded lobes by a longitudinal depression; immediately behind each lateral pair of eyes is a large and deep indentation, or excavation, running longitudinally backwards, and running out to a point near the occiput; at the larger or fore end of this excavation is a small, round, shining, eye-like fovea or impression; the clypeus is broad, bold, and well-rounded, and prominent at its lower side, its height being about half that of the facial space; the fore

side of the eminence on the caput, as well as the upper part of the fore extremity of the caput itself, is clothed with a few short hairs, directed forwards and downwards.

The *eyes* are small, placed in the usual four pairs, on black spots; those of the upper or hind central pair are placed on the fore side of the summit of the cephalic eminence, each being rather more than a diameter's distance from the longitudinal line which divides its two lobes from each other; the other three pairs (looked at either in front or sideways) form a transverse straight line at the fore extremity, on the upperside of the caput, rather exceeding in length that formed by each lateral pair and the hind central eye on its side; those of each lateral pair are placed a little obliquely on a slight tubercle; those of the fore central pair are near together (but not contiguous to each other) on a tubercle.

The *legs* are long and slender, coloured as described above, and furnished with hairs, and some fine spines beneath the tibiæ of the first and second pairs; their relative length is 1, 4, 2, 3.

The *palpi* are tolerably strong and moderate in length; the cubital joint has some short spine-like bristles on its outer side, it is slightly bent downwards, and about double the length of the radial, which has its fore extremity on the upperside prominently produced into a moderately long tapering apophysis, curved downwards, and its margins fringed with hairs; the digital joint is large, and of an irregular form, and suffused with brown; it has a strong, prominent, somewhat keel-like lobe at its base on the outer side, furnished with a single row of very short, but strong, closely set, curved, spine-like bristles; the palpal organs are highly developed, prominent, and complex; a large corneous process projects from their extremity, and a strong, black, tapering spine issuing from its base curves in a circular form backwards on their outer side; in connexion with this spine, quite to its point, there is some yellowish diaphanous membrane; above the spine just noted, at the base of these organs, on their outer side, are two other large irregular corneous processes.

The *falces* are tolerably strong, but not very long; they are of a conical form, directed backwards towards the labium, and furnished with a few very minute teeth on the inner margin near their extremities.

The *maxillæ*, *labium*, and *sternum* are of normal form.

The *abdomen* is large, of a roundish oval form, tolerably convex above, and of a glossy black colour, the spiracular plates being yellow; it projects a little over the base of the cephalothorax, and is clothed thinly with very short hairs, its surface being thickly covered with very minute puncture-like impressions, four of a larger size forming on the middle of the upperside a rectangular figure whose fore side is shortest.

The *female* resembles the male in colours and general characters; but the cephalothorax is devoid of the cephalic eminence, the abdomen is more convex above, and the spines on the tibiæ (and metatarsi as well) of the first two pairs of legs are of a more marked character; the palpi have, among other hairs and bristles, a row of

spine-like bristles round the fore extremity, on the upperside of the radial joint, forming a kind of *chevaux-de-frise*; the genital aperture is of a simple but characteristic form.

An adult male and twelve females were received from Mr. J. H. Emerton, by whom they were found at Ipswich, near Boston, Massachusetts, U. S. A., in June 1874.

LIST OF SPECIES DESCRIBED.

1. *Erigone persimilis*, sp. n., ♂, p. 394, Plate XLVI. fig. 1.
2. — *dentigera* (Camb.), ♂, p. 394, Plate XLVI. fig. 2.
3. — *ornata*, sp. n., ♂, p. 395, Plate XLVI. fig. 3.
4. — *pictilis*, sp. n., ♂ & ♀, p. 396, Plate XLVI. fig. 4.
5. — *provida*, sp. n., ♀, p. 398, Plate XLVI. fig. 5.
6. — *pertinens*, sp. n., ♂ & ♀, p. 399, Plate XLVI. fig. 6.
7. — *persoluta*, sp. n., ♂ & ♀, p. 400, Plate XLVI. fig. 7.
8. — *cornupalpis*, sp. n., ♂, p. 401, Plate XLVI. fig. 8.
9. — *multesima*, sp. n., ♀, p. 402, Plate XLVI. fig. 9.
10. — *viaria*, Bl., ♂ & ♀, p. 403.
11. — *florens*, sp. n., ♂ & ♀, p. 403, Plate XLVI. fig. 10.

EXPLANATION OF PLATE XLVI.

Fig. 1. *Erigone persimilis* ♂.

a, part of right palpus, from the outer side; *c*, palpal organs, very highly magnified; *e*, radial joint of right palpus, from above and behind.

2. *Erigone dentigera* (Camb.) ♂.

b, part of right palpus, from outer side; *d*, palpal organs, very highly magnified; *f*, radial joint of right palpus, from above and behind; *g*, radial joint of right palpus of *Erigone atra*, Bl., also from above and behind.

3. *Erigone ornata* ♂.

a, Spider in profile; *b*, caput and falces, from the front; *c*, upperside of Spider; *d*, left palpus, from outer side, rather in front; *e*, ditto, from inner side, also rather in front; *f*, natural length of Spider.

4. *Erigone pictilis* ♂.

a, Spider in profile; *b*, upperside of cephalothorax and abdomen; *c*, caput and falces, from the front; *d*, right palpus, from outer side, rather underneath; *e*, natural length of Spider.

5. *Erigone provida* ♀.

a, profile of Spider; *b*, caput and falces, from the front; *c*, genital aperture; *d*, natural length of Spider.

6. *Erigone pertinens* ♂ & ♀.

a, profile (♂); *b*, caput and falces (♂), from the front; *c*, right palpus (♂), from the front; *d*, genital aperture (♀); *e*, natural length of Spider.

7. *Erigone persoluta* ♂ & ♀.

a, profile (♂); *b*, caput and falces (♂), from the front; *c*, left palpus (♂), from the front, on inner side; *d*, genital aperture (♀); *e*, natural length of Spider.

8. *Erigone cornupalpis* ♂.

a, profile; *b*, caput and falces, from the front; *c*, left palpus, from the front; *d*, right palpus on outer side in front; *e*, natural length of Spider.

9. *Erigone multesima* ♀.

a, profile; *b*, caput and falces, from the front; *c*, genital process; *d*, ditto, in profile; *e*, natural length of Spider.

10. *Erigone florens* ♂ & ♀.

a, profile (♂); *b*, caput and falces (♂), from the front; *c*, left palpus (♂) on outer side; *d*, genital aperture (♀); *e*, natural length of Spider.

6. A List of the Collection of Diurnal Lepidoptera made by Mr. J. J. Monteiro, in Angola, with Descriptions of some new Species. By HERBERT DRUCE, F.L.S., F.Z.S.

[Received May 10, 1875.]

The kindness of Mr. Monteiro has enabled me to compile the following list of his Butterflies, and to add examples of all the species to my collection. The collection was a rich one, containing one hundred and sixty-six species, many of which were new to science. So far as I know the Butterfly-fauna of Angola, it is more nearly allied to that of the Cape and Natal than to that of the west coast, though many species are common to both localities.

Subfamilia I. DANAINÆ, Bates.

Genus DANAIS, Latr.

D. LEONORA, Butl. P. Z. S. 1866, p. 51.

Genus AMAURIS, Hübn.

A. HYALITES, Butl. Cist. Ent. vol. i. p. 209 (1874).

Ambriz (*J. J. M.*).

Of this distinct species Mr. Monteiro only obtained three specimens, one of which, the type, is in the B.M. The other two are now in my own collection.

Genus MYCALESIS, Hübn.

1. M. SAFITZA, Hew. Gen. D. L. p. 394. n. 10, note.

2. M. VULGARIS, Butl. Cat. Sat. B. M. p. 130, t. 3. f. 2 (1868).

3. M. SANAOS, Hew. Ex. Butt. iii. *Myc.* t. 8. f. 51, 52 (1866).

4. M. ASOCHIS, Hew. *l. c.* t. 7. f. 46, 47 (1866).

5. M. ELIASIS, Hew. Ex. Butt. iii. *Myc.* t. 7. f. 44, 45 (1866).
Ambriz (*J. J. M.*).

6. M. DOROTHEA, Cram. Pap. Ex. iii. t. 204. f. E, F. (1782).

Genus YPTHIMA, Hübn.

1. Y. ASTEROPE, Klug, Symb. Phys. t. 29. f. 11-14 (1832).

2. Y. PHILOMELA, Joh. ? Amœn. Acad. vi. p. 404 (1764).

I cannot be sure that this Butterfly is rightly named; the collection contained a single specimen in very bad condition.

Subfamilia III. ELYMNIINÆ, Herr.-Schäff.

ELYMNIAS, Hübn.

E. BAMMAKOO, Westw. Gen. D. L. p. 405. n. 12, note (1851).

A very distinct species, and nothing to do with *E. phegea*, Fab., with which it is frequently placed in collections. The sexes of both species are in my collection.

Subfamilia VI. ACRÆINÆ, Bates.

Genus ACRÆA, Fabr.

1. *A. NEOBULE*, Doubl. Hew. Gen. D. L. t. 19. f. 3 (1848).

Boma (*J. J. M.*). A fine series of this species was in the collection.

2. *A. LYCIA*, Fab. Syst. Ent. p. 464 (1775).

3. *A. ABDERA*, Hew. Ex. Butt. i. *Acr.* t. 1. f. 1, 2 (1852).

One specimen only.

4. *A. ZETES*, Linn. Syst. Nat. i. 2, p. 766 (1756).

Of this species there are several very interesting pale-coloured varieties.

5. *A. PSEUDOLYCIA*, Butl. Cist. Ent. p. 213 (1874).

Quanza (*J. J. M.*). A very distinct species.

6. *A. SERENA*, Fabr. Syst. Ent. p. 461 (1775).

Quanza (*J. J. M.*).

7. *A. BONASIA*, Fabr. *l. c.* p. 464.

8. *A. EPONINA*, Cram. Pap. Ex. iii. t. 268. f. A, B (1782).

Banana, January 1873 (*J. J. M.*).

9. *A. RAHIRA*, Boisd. Faune Mad. p. 33, t. 5. f. 4, 5 (1833).

10. *A. LYCOA*, Godt. Enc. Méth. ix. p. 239 (1819).

Bonny, July 1872 (*J. J. M.*).

11. *A. CARMENTIS*, Doubl. & Hew. Gen. D. L. t. 19. f. 1 (1848).

12. *A. EURYTA*, Linn. Mus. Ulr. p. 221 (1764).

13. *A. MONTEIRONIS*, Butl. Cist. Ent. p. 211 (1874).

Ambriz and Bembe (*J. J. M.*).

14. *A. METAPROTEA*, Butl. *l. c.* p. 211.

Ambriz (*J. J. M.*).

15. *A. ARCTIFASCIA*, Butl. Trans. Ent. Soc. 1874, p. 427.

16. *A. PSEUDOPTERA*, Butl. *l. c.* p. 428. n. 2.

17. *A. AMPHIPROTEA*, Butl. *l. c.* n. 3.

The above five species are very closely allied; and had not Mr. Butler and myself been able to find the sexes of each, I should have preferred considering them as all varieties of one variable species. I have a long series of most of them in my collection.

18. *A. EGINA*, Cram. Pap. Ex. i. t. 39. f. F, G (1776).

19. *A. FORMOSA*, Butl. Cist. Ent. p. 213 (1874).
Cabinda (*J. J. M.*).

20. *A. PSEUDEGINA*, Westw. Gen. D. L. p. 531 (1852).

The specimens are brighter-coloured than those from Sierra Leone; but the markings are just the same.

21. *ACRÆA LYGUS*, n. sp.

Upperside orange-brown. Anterior wing with the base, the spot at the end of the cell, two small spots below, and a short band of four spots near the costal margin, the apex and the outer margin black; posterior wing with the base and outer margin broadly black, a small black spot at the end of the cell, and a large pinkish white patch in the middle of the wing nearest the abdominal margin. Underside, anterior wing pale orange, a large black spot in the cell and one close to the base, the other spots as above, the black outer margin much narrower; posterior wing pinkish orange, almost pink at the base, crossed from the costal margin to the inner margin by two rows of black spots, the row nearest the base the largest, the outer margin broadly black, with a submarginal row of white spots.

Exp. 2 in.

Angola (*J. J. M.*).

Type, Mus. Druce.

Subfamilia VIII. NYMPHALINÆ, Bates.

Genus *ATELLA*, Doubl.

A. PHALANTA, Drury, Ill. Ex. Ent. i. t. 21. f. 1, 2 (1773).

Genus *JUNONIA*, Hübn.

1. *J. CLELIA*, Cram. Pap. Ex. i. t. 21. f. E, F (1775).

2. *J. CEBRENE*, Trim. Trans. Ent. Soc. 1870, p. 353.
Ambriz (*J. J. M.*).

Genus *PRECIS*, Hübn.

1. *P. OCTAVIA*, Cram. Pap. Ex. ii. t. 135. f. B, C (1779).

2. *P. CERYNE*, Boisd. Voy. Deleg. ii. p. 592 (1847).

3. *P. ARCHESIA*, Cram. Pap. Ex. iii. t. 219. f. D, E (1782).
Banana (*J. J. M.*).

4. *P. NATALICA*, Feld. Wien. ent. Mon. iv. p. 106 (1860).

The specimens of this species are smaller than any I have seen from Natal.

5. *P. CLOANTHA*, Cram. Pap. Ex. iv. t. 338. f. A, B (1782).

Genus *SALAMIS*, Boisd.

- S. ANACARDII*, Linn. Mus. Ulr. p. 236 (1764).

The specimens of this species are smaller than those from Natal, with a much deeper pink gloss over the wings.

Genus *KULLIMA*, Westw.

- K. RUMIA*, Westw. Gen. D. L. p. 325. n. 5, t. 52. f. 2 (1850).

Genus *EURYTELA*, Boisd.

1. *E. DRYOPE*, Cram. Pap. Ex. i. t. 78. f. E, F (1779).

Both sexes of this species were in the collection; the female is much paler-coloured than the male.

2. *E. HIARBAS*, Drury, Ill. Ex. Ent. iii. t. 14. f. 1, 2 (1782).

The specimens from Angola have the white band of the posterior wing much wider than those from Natal.

3. *E. OPHIONE*, Cram. Pap. Ex. ii. t. 114. f. E, F (1779).

Banana (*J. J. M.*).

Genus *ERGOLIS*, Boisd.

- E. ENOTREA*, Cram. Pap. Ex. iv. t. 236. f. A, B (1782).

Genus *HYPANIS*, Boisd.

- H. HITHYIA*, Dru. Ill. Ex. Ent. ii. t. 17. f. 1, 2 (1773).

A very variable species, common to the whole of Southern Africa.

Genus *DIADEMA*, Boisd.

1. *D. MISIPPUS*, Linn. Mus. Ulr. p. 264 (1764).

2. *D. SALMACES*, Dru. Ill. Ex. Ent. ii. t. 8. f. 1, 2 (1773).

3. *D. MONTEIRONIS*, Druce, Cist. Ent. p. 286 (1874).

The collection contained two specimens only of this fine new species, both of which are females.

4. *D. DUBIUS*, Beauv. Ins. Afr. Amér. p. 238, t. 6. f. 2, *a*, *b* (1805).

5. *D. ANTHEDON*, Doubl. Ann. Nat. Hist. xvi. p. 181 (1845).

Genus GODARTIA, Luc.

1. *G. ANSELLICA*, Butl. Trans. Ent. Soc. 1870, p. 525.

The specimens of this species are small. "Found inland in open ground" (*J. J. M.*).

2. *G. TRAJANUS*, Ward. Ent. Mo. Mag. vol. viii. p. 36 (1871).

Three specimens only of this fine insect were taken by Mr. Monteiro, in the deep shade of the forest, about fifty miles inland.

Genus PSEUDACRÆA, Westw.

1. *P. SEMIRE*, Cram. Pap. Ex. iii. t. 194. f. B, C (1780).

2. *P. EURYTA*, Linn.

3. *P. METAPTANEMA*, Butl. Cist. Ent. p. 215 (1874).

Ambriz (*J. J. M.*).

4. *P. FULVARIA*, Butl. *l. c.* p. 214 (1874).

5. *P. BOISDUVALII*, Doubl. Ann. Nat. Hist. xvi. p. 180 (1845).

A rare species in Angola. Mr. Monteiro only obtained two or three specimens.

Genus NEPTIS, Fabr.

1. *N. SUCLAVA*, Boisd. Faune Mad. p. 49 (1833).

2. *N. MELICERTA*, Drury, Ill. Ex. Ent. ii. t. 19. f. 3, 4 (1773).

3. *N. NICOTELES*, Hew. Ent. Mo. Mag. p. 206 (1874).

4. *N. NEMETES*, Hew. Ex. Butt. iv. *Nep.* t. 1. f. 1, 2 (1868).

Genus EURYPHENE.

1. *E. SOPHUS*, Fab. Syst. Ent. iii. 1, p. 46 (1793).

2. *E. MARDANIA*, Fab. *l. c.* p. 249.

The collection contained many specimens of both sexes of this species.

3. *E. PHANTASIA*, Hew. Ex. Butt. iii. *Eur.* t. 2. f. 9-11 (1865).

The female of this species was in the collection; it is nearly twice the size of the male, with the apex of the anterior wing white.

4. *E. PLAUTILLA*, Hew. Ex. Butt. iii. *Eur.* t. 3. f. 14 (1866).

5. *E. PLISTONAX*, Hew. Ex. Butt. v. *Eur.* t. 9. f. 38, 39 (1874).

Mr. Monteiro only obtained a single specimen of this remarkable species, which is now in the collection of Mr. Hewitson.

Genus ROMALEOSOMA, Blanch.

1. *R. RUSPINA*, Hew. Ex. Butt. iii. *Rom.* t. 2. f. 6, 7 (1865).
2. *R. INANUM*, Butl. Cist. Ent. p. 158 (1873).
3. *R. XYPETE*, Hew. Ex. Butt. iii. *Rom.* t. 2. f. 8-10 (1865).
4. *R. THEMIS*, Hübn. Samm. ex. Schmett. (1806-1816).
5. *R. LOSINGER*, Hew. Ex. Butt. iii. *Rom.* t. 1. f. 5 (1864).
6. *R. EUPALUS*, Fabr. Spec. Ins. ii. p. 54 (1781).
7. *R. MEDON*, Linn. Syst. Nat. i. 2, p. 753 (1767).

The specimens of this species are very fine.

8. *R. COPRATES*, n. sp.

Upperside dark chestnut brown, glossed with green; anterior wing with the costal margin and the apical half glossy greenish black, crossed near the apex by a white band, which is crossed by the black nervules, two distinct black spots in the cell; posterior wing with the outer margin broadly greenish-black, traversed by a band of seven greenish-white spots, the fringe of both wings alternately black and white, the nervules of both wings all black. Underside greenish brown, darkest on the outer margin of the wings; anterior wing with the white band as above, and three black spots in the cell; posterior wing with the costal margin greenish white, a black spot close to the base, and one in the middle of the cell, two white spots at the end of the cell, and the submarginal band of white spots, the same as above. The female the same as the male, only larger.

Exp. ♂ $2\frac{3}{4}$ in., ♀ $3\frac{3}{4}$ in.

Angola (*J. J. M.*).

Type, Mus. Druce.

This species is easily distinguished from *R. eleus* by its greener colour, and having black spots in the cells of both wings.

Genus ATERICA, Boisd.

1. *A. AFER*, Drury, Ill. Ex. Ent. iii. t. 36. f. 1, 2 (1782).

The collection contained the males only of this species.

2. *A. CLORANA*, Druce, Trans. Ent. Soc. 1874, p. 157.

Ambriz, not common (*J. J. M.*).

3. *A. CUPAVIA*, Cram. Pap. Exot. iii. t. 193. f. E, F (1780).

4. *A. MELEAGRIS*, Cram. Pap. Ex. i. t. 66. f. A, B (1779).

The specimens of this species are very pale-coloured, with the white spots much smaller than the specimens I have from Old Calabar. Mr. Monteiro tells me that the species of this genus always fly in the dense forest.

Genus HARMA, Westw.

1. *H. THEODOLA*, Hew. Ex. Butt. iii. *Har.* t. 1. f. 3, 4 (1864).

This species I believe to be the male of *beckeri*; all the specimens I have examined of that species are females, and they agree in most respects on the underside. In all the collections that I have seen containing the one species the other is always with it.

2. *H. HESIODUS*, Hew. Ex. Butt. iv. *Har.* t. 4. f. 15-18 (1869).

A fine series of both sexes of this species was in the collection, with a very dark variety of the male, the black extending nearly over the whole of the wing.

"Rare in Angola, but abundant at Cabinda, North of the Congo" (*J. J. M.*).

3. *H. LURIDA*, Butl. P. Z. S. 1871, p. 80.

Both sexes of this species were in the collection.

4. *H. BECKERI*, Herr.-Schäff. Ex. Schmett. f. 81 (1852-1858).

5. *H. SANGARIS*, Godt. Enc. Méth. ix. p. 384 (1823).

Rare in Angola (*J. J. M.*).

6. *H. ADELINA*, Hew. Ex. Butt. iv. t. 3. f. 9, 11 (1869).

7. *H. CORSANDRA*, Druce, Trans. Ent. Soc. 1874, p. 158.

One specimen only in the collection.

8. *H. THEOBENE*, Doubl. & Hew. Gen. D. L. t. 40. f. 3 (1850).

9. *H. CÆNIS*, Drury, Ill. Ex. Ent. ii. t. 19. f. 1, 2 (1819).

Very common in the woods about fifty miles inland.

Genus CHARAXES, Ochs.

1. *C. POLLUX*, Cr. Pap. Ex. i. t. 37. f. E, F (1776).

2. *C. SATURNUS*, Butl. P. Z. S. 1865, p. 624, t. 36. f. 1.

3. *C. CASTOR*, Cr. Pap. Ex. i. t. 37. f. C, D (1776).

4. *C. BRUTUS*, Cr. *l. c.* iii. t. 241. f. E, F (1782).

5. *C. CANDIOPE*, Godt. Enc. Méth. ix. p. 357 (1823).

6. *C. EPHYRA*, Godt. *l. c.* p. 355.

Males only of this species were in the collection.

7. *C. TIRIDATES*, Cr. Pap. Ex. ii. t. 161. f. A, B (1779).

8. *C. BOHEMANI*, Feld. Wien. ent. Mon. iii. p. 321, t. 6. f. 3 (1859).

A fine series of this rare species was in the collection.

9. *C. NESIOPE*, Hew. Ex. Butt. i. *Nymph.* t. i. f. 5, 6 (1854).

Mr. Monteiro only obtained two or three specimens of this species.

10. *C. EUPALE*, Dru. Ill. Ex. Ent. iii. t. 6. f. 3 (1782).

Genus *PHILOGNOMA*, Westw.

1. *P. DECIUS*, Cram. Pap. Ex. ii. t. 114. f. A, B (1779).

2. *P. VARANES*, Cram. *l. c.* t. 160. f. D, E.

Very common always in the woods (*J. J. M.*).

Familia II. *LEMONIIDÆ*.

Subfamilia II. *NEMEOBIINÆ*, Bates.

Genus *ABISARA*, Feld.

1. *A. GERONTES*, Fabr. Spec. Ins. ii. p. 117 (1781).

2. *A. TANTALUS*, Hew. Ex. Butt. ii. *Sosp.* t. 1. f. 1 (1861).

Familia III. *LYCÆNIDÆ*, Steph.

Genus *PENTILA*, Westw.

P. AMENAIDA, Hew. Ex. Butt. v. *Pent. & Lipt.* ii. f. 4-7 (1873).

Only a few specimens of this species come in the collection.

Genus *MIMACRÆA*, Butl.

M. DARWINIA, Butl. Lep. Exot. p. 104, t. 38. f. 8 (1872).

Two specimens only (♂, ♀), in the collection, mixed up with *Acræa pseudoptera*, which it closely resembles.

Genus *LIPTENA*, Doubl. & Hew.

1. *L. ACRÆA*, Doubl. & Hew. G. D. L. t. 77. f. 6 (1852).

2. *L. UNDULARIS*, Hew. Ex. Butt. *Pent. & Lipt.* f. 7 (1866).

3. *L. LIBYSSA*, Hew. *l. c.* f. 5, 6 (1866).

A very variable species.

Genus *ZERITIS*, Boisd.

Z. HARPAX, Fab. Syst. Ent. App. p. 809 (1775).

Genus *CUPIDO*, Schrank.

1. *C. ELOREA*, Fab. Ent. Syst. iii. 1, p. 191 (1793).

2. *C. CALICE*, Hopff. Ber. Verh. Ak. Berl. 1855, p. 642.

3. *C. OSIRIS*, Hopff. *l. c.* p. 642 (1855).

In this genus are several small species that I cannot with certainty determine.

Genus *HYPOLYCÆNA*, Feld.

1. *H. PHILIPPUS*, Fab. Ent. Syst. iii. 1, p. 283 (1793).
2. *H. LEBONA*, Hew. Ill. D. L. p. 51. n. 9 (1865).
Quanza (*J. J. M.*).
3. *H. ANTIFAUNUS*, Doubl. & Hew. Gen. D. L. t. 75. f. 1 (1852).
Only two specimens of this species.
4. *H. HATILA*, Hew. Ill. D. L. p. 51, t. 23. f. 21-24 (1865).
5. *H. FAUNUS*, Drury, Ill. Ex. Ent. ii. t. 1. f. 4, 5 (1777).
6. *H. ELEALA*, Hew. Ill. D. L. p. 52, t. 23. f. 25-27 (1865).

Genus *LYCÆNESTHES*, Moore.

1. *L. LARYDAS*, Cr. Pap. Ex. iii. t. 282. f. H (1782).
2. *L. LEGURES*, Hew. Trans. Ent. Soc. 1874, p. 349.
3. *L. LYZANIUS*, Hew. Ent. Mo. Mag. vol. xi. p. 36 (1874).
Only two or three specimens in the collection.

Genus *JOLAUS*, Hübn.

- J. BOWKERI*, Trim. Trans. Ent. Soc. ser. 3, vol. ii. p. 176 (1864).
The collection contained a fine series of this species.

Genus *LOXURA*, Horsf.

- L. SILENUS*, Fab. Syst. Ent. p. 531 (1775).

Familia IV. *PAPILIONIDÆ*, Leach.Subfamilia I. *PIERINÆ*, Swains.Genus *PONTEA*, Fabr.

- P. ALCESTA*, Cram. Pap. Ex. iv. t. 379 (1782).
The specimens of this species are very small.

Genus *TERIAS*, Swains.

1. *T. BRIGITTA*, Cram. Pap. Ex. iv. t. 331. f. B, C (1782).
2. *T. PULCHELLA*, Boisd. Faun. Mad. p. 20, t. 2. f. 7 (1833).
3. *T. SENEGALENSIS*, Boisd. Sp. Gén. 672 (1836).

Genus *MYLOTHRIS*, Hübn.

- M. POPPEA*, Cr. Pap. Ex. ii. pl. 110. f. D (1779).

Genus *BELENOIS*, Hübn.

1. *B. CALYPSO*, Drury, Ill. Ex. Ent. ii. pl. 17. f. 3, 4 (1773).
Mr. Monteiro obtained a beautiful orange-coloured female of this species.
2. *B. SABINA*, Feld. Reise Nov. Lep. ii. p. 167 (1865).
3. *B. SOLILUCIS*, Butl. Trans. Ent. Soc. 1874, p. 433.

4. *B. THYSA*, Hopffer, Ber. Verh. Ak. Berl. p. 639 (1855).
5. *B. LARIMA*, Boisd. Sp. Gén. i. p. 524 (1836).
Pieris capricornus, Ward, Ent. Mo. Mag. vol. viii. p. 59 (1871),
is only a variety of the above.
6. *B. SYLVIA*, Fab. Syst. Ent. p. 470 (1775).
7. *B. LOCHALIA*? var., Boisd. Sp. Gén. Lép. i. p. 508 (1832).

Genus *HERPÆNIA*, Butl.

- H. ERIPHIA*, Godt. Enc. Méth. ix. p. 157 (1819).

Genus *ERONIA*, Hübn.

1. *E. ARGIA*, Fabr. Syst. Ent. p. 470 (1775).
2. *E. BUQUETI*, Boisd. Sp. Gén. i. p. 607 (1836).

Genus *IDMAIS*, Boisd.

1. *T. HEWITSONI*, Kirb.

T. chrysonome, Doubl. & Hew. Gen. D. L. t. 7. f. 5 (1847).

Mr. Monteiro obtained a long series of this insect. I quite agree with Mr. Kirby that it is very distinct from *T. chrysonome* of Klug, both sexes of which are in my collection from Nubia.

2. *T. DYNAMENE*, Klug, Symb. Phys. t. 6. f. 17, 18 (1829).
Loanda, Quanza, Ambriz (*J. J. M.*).

3. *T. ERIS*, Klug, Symb. Phys. t. 6. f. 15, 16 (1829).

The collection contained a pale yellow variety of the female of this species.

Genus *CALLOSUME*, Doubl.

1. *C. EVIPPE*, Linn. Mus. Ulr. p. 239 (1764); Clerck, Icones, t. 40. f. 5 (1764).

Ambriz and Loanda (*J. J. M.*).

2. *C. INTERRUPTUS*, Butl. P. Z. S. 1871, p. 724.
Loanda, August 1872 (*J. J. M.*).

3. *C. HEUGLINI*, Feld. Wien. ent. Mon. iii. p. 272 (1859).
Ambriz, October 1872 (*J. J. M.*).

4. *C. EPHYIA*, Klug, Symb. Phys. t. 6. f. 9, 10 (1829).

Subfamilia II. *PAPILIONINÆ*, Swains.Genus *PAPILIO*, Linn.

1. *P. POLICENES*, Cram. Pap. Ex. i. t. 37. f. A, B (1776).

2. *P. ANTHEUS*, Cram. *ib.* t. 234. f. B, C.

One very broken specimen.

3. *P. CORINNEUS*, Bert. Mem. Bologna, 1849, p. 9, t. 1. f. 1-3.
4. *P. LEONIDAS*, Fabr. Ent. Syst. iii. 1, p. 35 (1793).
5. *P. BRASIDAS*, Feld. Verh. zool.-bot. Ges. xiv. p. 307 (1864).
6. *P. RIDLEYANUS*, White, Ann. Nat. Hist. xii. 262 (1843).
Three specimens only.
7. *P. DEMOLEUS*, Linn. Mus. Ulr. p. 214 (1764).
8. *P. MENESTHEUS*, Drury, Ill. Ex. Ent. ii. t. 9. f. 1, 2 (1773).
The variety figured by Mr. Trimen in his Rhop. Afr. Austr. p. 320, t. 2. f. 1, seems to take the place of the typical form in South Africa.
9. *P. NIREUS*, Linn. Mus. Ulr. p. 217 (1764).
10. *P. MEROPE*, Cram. Pap. Ex. ii. t. 151. f. A, B (1779).
11. *P. CYPRÆAFILA*, Butl. Ent. Mo. Mag. v. p. 60 (1868).
12. *P. CYNORTA*, Fabr. Ent. Syst. iii. 1, p. 37 (1793).
13. *P. HIPPOCOON*, Fabr. Ent. Syst. iii. 1, p. 38 (1793).

Familia V. *HESPERIDÆ*, Leach.

Genus *ISMENE*, Swains.

ISMENE LIBEON, n. sp.

Form of *T. ramantek*, Bd. Upperside dark-purplish brown, the inner half of the hind wing clothed with a few pale brown hairs; the fringe at the anal angle almost white. The underside pale brown glossed with purple, with a small indistinct white spot near the anal angle.

Exp. $1\frac{3}{4}$ in.

Angola.

Type, Mus. Druce.

Mr. Monteiro only obtained a single specimen of this species.

Genus *CARYSTUS*, Hübn.

C. LAUFELLA, Hew. Ex. Butt. iv. *Hesp.* t. 2. f. 28-30 (1867).

The Angola specimens of this species are much smaller and darker-coloured than those from Old Calabar.

Genus *PAMPHILA*, Fabr.

P. MACKENII, Trim. Trans. Ent. Soc. 1868, p. 95, t. 6. f. 8.

Genus *PYRGUS*, Hübn.

PYRGUS COLOTES, n. sp.

Upperside black; anterior wing clothed with a few grey hairs at the base, three white spots in the cell, and a band of five white spots crossing the middle of the wing from the costal to the middle margin; a submarginal row of very minute white dots; posterior

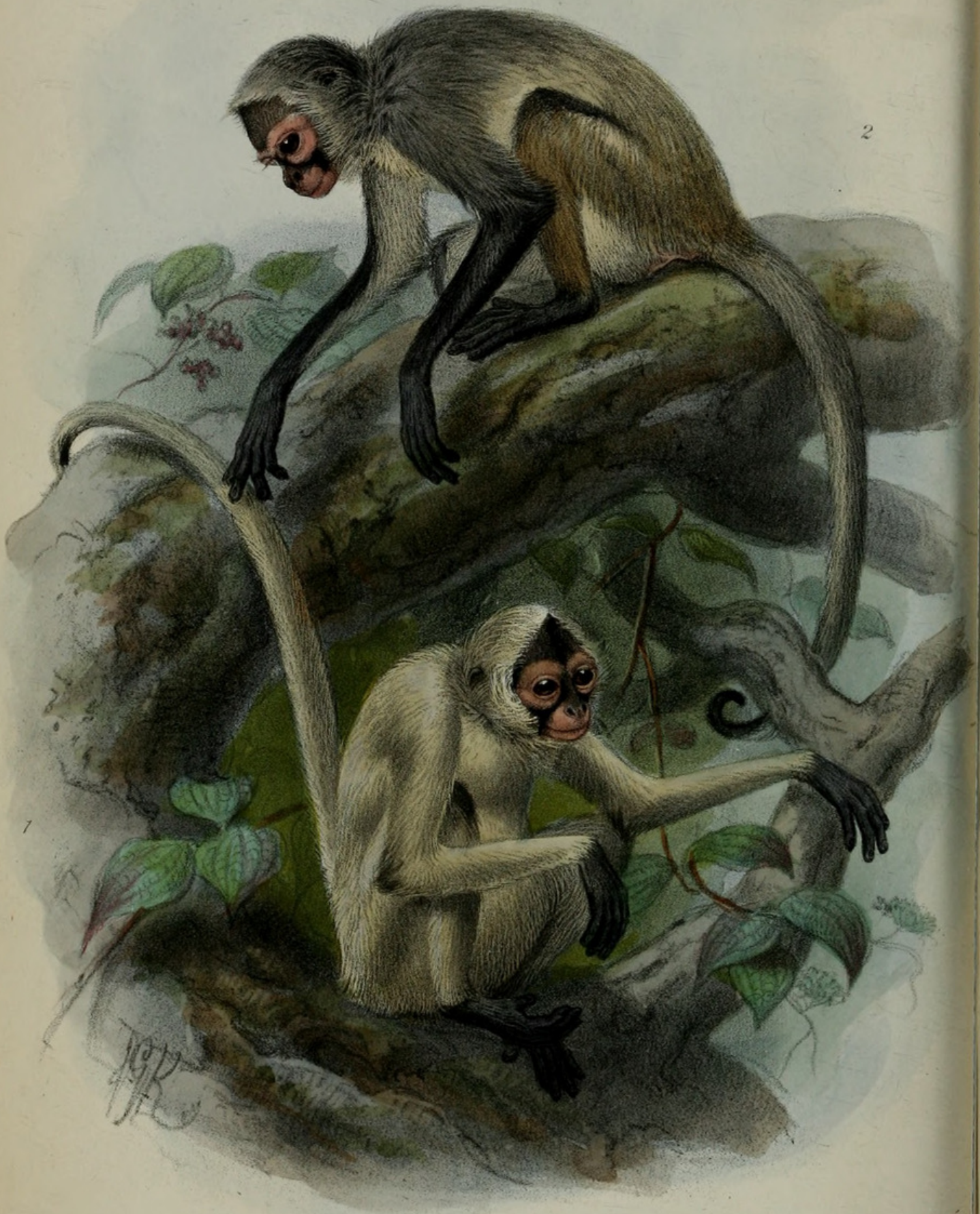


J.G. Keulemans, lith.

M & N Hanhart, imp

MACACUS SPECIOSUS.

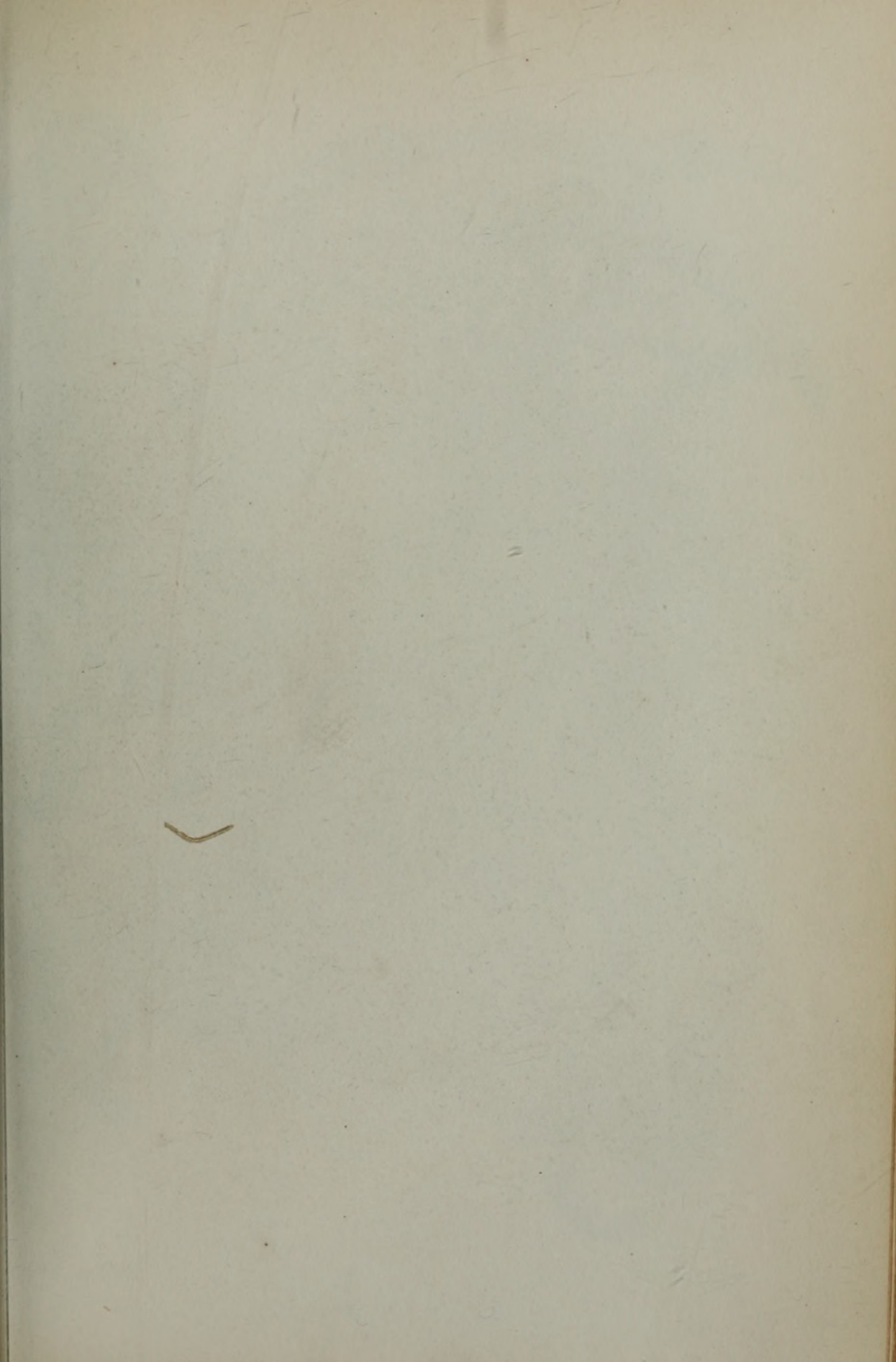
2



J.G. Keulemans lith.

M & N Hanhart imp.

ATELES MELANOCHIR.

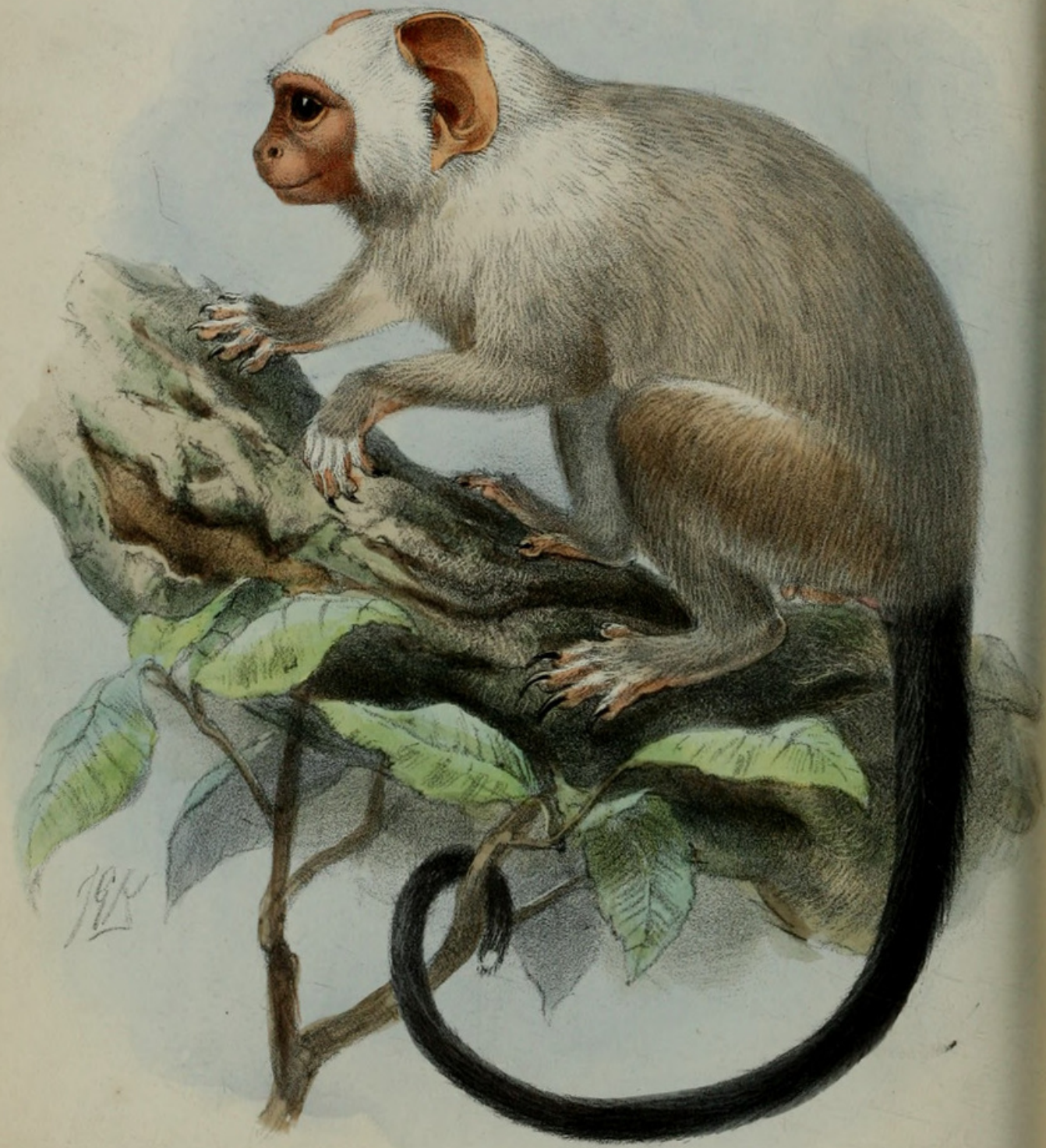




J.G. Keulemans, lith.

M&N. Hanhart imp.

ATELES MELANOCHIR.



J. G. Keulemans, lith.

M & N. Hanhart imp.

HAPALE MELANURA.



2

J. Smit

wing with a white spot close to the base, crossed at the middle by a band of four white spots and a submarginal row of minute white spots; the fringe of both wings alternately black and white. The underside the same as above, except that all the white spots are a little larger.

Exp. $3\frac{3}{4}$ in.

Angola (*J. J. M.*).

Type, Mus. Druce.

A beautiful little species allied to *P. diomus*, Hopff.

Genus *ASTICTOPTERUS*, Feld.

A. LEPETETIERII, Latr. Enc. Méth. ix. p. 777 (1823).

Genus *CYCLOPIDES*, Hübn.

C. METIS, Linn. Mus. Ulr. p. 325 (1764).

Genus *PARDALEODES*, Butl.

1. *P. SATOR*, Doubl. & Hew. Gen. D. L. t. 79. f. 4 (1852).

2. *P. LARONIA*, Hew. Desc. Hesp. p. 35 (1868).

A single specimen of this species was in the collection.

Genus *TAGIADES*, Hübn.

TAGIADES HEREUS, n. sp.

Upperside, anterior wing dark brown, palish at the anal angle, four minute semitransparent spots on the middle of the costal margin, two below them, and six near the apex; posterior wing yellowish white, the base and the costal margin dark brown, with three brown spots on the hind margin close to the apex. Underside the same as above, except the costal margin of the posterior wing, which is not nearly so brown as above.

Exp. $1\frac{1}{2}$ in.

Angola.

Type, Mus. Druce.

Mr. Monteiro only obtained a single specimen of this insect; it is quite unlike any other with which I am acquainted.

7. On several rare or little-known Mammals now or lately living in the Society's Collection. By P. L. SCLATER, M.A., Ph.D., F.R.S., Secretary to the Society.

[Received May 12, 1875.]

(Plates XLVII.—LI.)

The difficulty of determining living animals accurately, especially where the species is of rare occurrence or belongs to a genus imperfectly known, must be obvious to every naturalist. I need hardly, therefore, apologize for finding it necessary to make occasional revisions of the terms employed in the lists now printed every month of

the additions made to the Society's Menagerie. On the present occasion I have several such rectifications to offer, and have, moreover, additional remarks to make on certain of the rarer species which now are, or lately have been, exhibited in our Gardens.

1. *MACACUS SPECIOSUS*. (Plate XLVII.)

Macacus speciosus, G. St.-Hil. et F. Cuv. Hist. Nat. Mam. i. t. 46.

On the 2nd of March last year Capt. Nutsford, of the ship 'Westbury,' brought home for us, from the east, a young female Ape, which was entered in the register at the time as a "St. John's Monkey," and as having been presented by that gentlemen. The Ape, growing more mature, began to show its red face; and upon reexamining it in the autumn, I came to the conclusion that it was a Japanese Ape (*Inuus speciosus* of the 'Fauna Japonica'), and so entered it in the Appendix to the volume of Proceedings for last year*. This specimen, now nearly adult, is still thriving in the Monkey-house. The fur is generally of a more olive tinge than is given in the figures hitherto published, and the face not perhaps quite so carneous, as will be seen by Mr. Keulemans's drawing.

I also now find that the real donor of the animal is Mr. Abel A. J. Gower, H.B.M. Consul at Hiogo and Osaka in Japan, to whom we are also indebted for a specimen of the rare *Pteromys leucogenys* and other rare animals. Mr. Gower informs me that he obtained this Monkey at Kioto, some thirty miles from Hiogo, where the species is common on the hills†.

According to the 'Revised Catalogue of Vertebrates' (p. 16‡), it will be noticed that we have previously received, in 1864, a Monkey considered to be *Macacus speciosus*. But Dr. Günther has called my attention to the fact that this specimen, which is now in the British Museum, is really an example of *Macacus melanotus*§—a species established by Ogilby, founded on a specimen also formerly living in the Society's Menagerie and now in the British Museum. This Macaque, of which the habitat is still unfortunately unknown, is at once distinguishable from *M. speciosus* by its minutely punctulated fur, whereas that of *M. speciosus* is quite uniform.

2. *MACACUS RHESO-SIMILIS*, Sclater, P. Z. S. 1872, p. 495, pl. xxv.

This was a provisional name based by me on a single female specimen brought by Mr. Jamrach from Calcutta in 1872. The individual died on the 9th of the following December; and I exhibit its skin and skull, which I now propose to transfer to the British Museum. The specimen agrees best with the imperfectly known *M.*

* See P. Z. S. 1874, p. 685.

† Dr. J. J. Rein (Zool. Gart. 1875, p. 55) tells us that this Ape is found all over the island of Nippon up to 41° N. lat., and has consequently a further northern range than any other existing Monkey.

‡ See also P. Z. S. 1864, p. 709.

§ *Papio melanotus*, Ogilby, P. Z. S. 1839, p. 31.

assamensis, or at any rate with the specimen which I determined as such (P. Z. S. 1871, p. 222), and which is the type of *M. problematicus*, Gray (Cat. Monkeys, p. 128), and is now in the British Museum. The fur is rather more reddish in tinge, and the tail is rather shorter*; but I am on the whole of opinion that the two specimens belong to the same species.

3. ATELES MELANOCHIR. (Plates XLVIII. & XLIX.)

The Black-handed Spider Monkey, as we call it, is now the commonest species of the genus which we receive alive, our correspondents of the West-Indian Mail Service bringing many specimens from the Central-American Ports. They exhibit great variations in colour, as will be seen from the skins now before us, and from the drawings by Mr. Keulemans of four individuals living in the Monkey-house in January last, which I exhibit. They seem to vary between the form designated *A. ornatus* by Dr. Gray, of which I have already given a figure (P. Z. S. 1871, pl. xv.), and the nearly uniformly grey form with black hands and feet, which Dr. Gray (Cat. Monkeys, p. 44) has called *A. albifrons*.

The problem is whether these different forms are confined to different localities, or whether they occur together in the same district. To settle this a large series from different localities in Central America should be examined, which as yet I have had no opportunity of doing. But all the light-grey specimens with black hands and feet (such as that figured Plate XLVIII. fig. 1†) are, so far as I can ascertain, from Nicaragua or Panama; and the dark form (*Ateles ornatus*) alone, as Mr. Salvin tells me, occurs on the Pacific coast of Guatemala. I am inclined to believe, therefore, that we have here to deal with a series of local forms of a "not yet differentiated" species.

4. HAPALE MELANURA. (Plate L.)

Iacchus melanurus, Geoffr. Ann. d. Mus. xix. p. 120 (1812).

Hapale melanura, Wagner, Säugeth. i. p. 127 et v. p. 127.

Mico melanurus, Gray, Cat. Monkeys, p. 64.

On Nov. 9th of last year we purchased of a dealer a Marmoset in bad condition, which at the time I took for *Hapale argentata* (Linn.), and so entered it in the register. It turns out, however, now that it has got clean and in good trim, to belong to the nearly allied and almost equally rare *H. melanura*, of which we have never previously received a living specimen. Mr. Keulemans's figure (Pl. L.) gives a correct likeness of this peculiar species‡. I likewise exhibit a skin of it obtained by Natterer in October, 1826, at Matogrosso in the interior of Brazil, from my own collection.

* Long. corp. 18 poll., caudæ 7.

† This and a similar specimen received at the same time (both females) were obtained by the late Mr. Richard Avery Rix, Medical Officer to the Chontales Mining Company at St. Domingo, near Libertad in Nicaragua, in 1873, and were presented to the Society by his father, Mr. S. W. Rix, in July 1874. They are still living in good health in the Society's Monkey-house (P. L. S., July 1st, 1875).

‡ Wagner's figure (Säugeth. v. pl. 13) is not at all good.

5. *CANIS FAMELICUS*, Cretzschmar (?).

Canis famelicus, Cretzschm. in Rüpp. Zool. Atl. p. 15, t. 5.

Fennecus dorsalis, Gray, List of Carn. p. 207.

On the 11th of June last year we received from Mr. Edwin Sandys Dawes a young Large-eared Fox, or Fennec, which he had obtained from the neighbourhood of Bushire, on the Persian Gulf. The animal unfortunately lost its tail from exposing itself to the attack of an evilly disposed neighbour shortly after its arrival; but with the exception that that organ has been restored from recollection, I believe Mr. Smit's sketch of it, which I now exhibit, is fairly accurate. The determination of this animal is a matter of some difficulty. It appears to be somewhat similar to the specimen presented to us by the Sinai Survey Expedition in 1869, which I determined as *Canis famelicus**, only larger. But Rüppell's figure of *Canis famelicus* does not show any black tip to the tail, which our present specimen certainly possessed, and I have much doubt whether it has been correctly referred to that species.

Our Persian-Gulf animal is about two feet long, with long, pointed snout, and large, erect ears. It is generally of a greyish sandy colour, paler below; the upper back darker; the lower back and face rufescent. The ears are black behind; and there is a distinct black patch before each eye. The feet are pale rufous. The tail is stated to have been long and bushy, with a dark streak along its upper surface and terminated by a black tip.

In answer to an inquiry respecting the exact locality and habits of this Fox, Mr. J. L. Oswald, of the same firm, was kind enough to send me the subjoined particulars:—

“In answer to your note to Mr. Dawes relating to the young Persian Fox sent by him to the Society, I am sorry I can give you but little information of the habits of this animal in Persia.

“It was captured within a short distance from the town of Bushire, where they are very numerous. The ground is rocky close to the sea-shore; and the animals retreat into rocky cavities. They are, of course, predatory, and commit depredations in the hen-roosts of adjacent villages. The natives do not hunt near the sea-coast; but in the interior sport is very common. The Foxes are easily captured with the aid of dogs; and Europeans resident in the neighbourhood of Bushire frequently amuse themselves in the evening ferreting out these animals, which often take to the sea, seeking safety from the dogs. I conclude they are herbivorous, but often felt curious to ascertain their mode of subsistence.

“Should you wish for another specimen, I shall be happy to be the means of obtaining it.”

Mr. Dawes and his friend promise me to obtain some more specimens of this interesting animal, which will, I trust, serve to enable me to distinguish the species accurately.

Meanwhile it is as well to record the existence of a Fox of this form on the Persian Gulf.

* See P. Z. S. 1869, p. 149, et Rev. Cat. Vert. p. 49.

6. *PROCYON CANCRIVORUS*.

Ursus cancrivorus, Cuv. Tabl. El. d'H. N. des Anim. p. 113 (1798).

Procyon cancrivorus, Wagner, Säugeth. ii. p. 160.

Of this southern form of *Procyon* we have certainly two very distinct kinds now living in the Gardens, which we call the Red-footed and Black-footed Crab-eating Raccoons. Of the former we have an adult male, being one of the two purchased of Dr. Ridpath, October 1, 1870, and stated to have been obtained at Colon, and a pair of young ones lately presented by Mr. J. R. H. Wilton, by whom they were brought from Demerara. Of the latter we have an adult male purchased of Mr. J. Simon in May, 1870, and *probably* from S.E. Brazil.

On comparing these animals together, it will be at once remarked that the red-footed animal is easily recognizable by its pale reddish feet, which are almost denuded of hairs, and its yellow body underneath. In the black-footed form the feet are more hairy and are of the same grey colour as the legs, and the body beneath shows no tinge of yellowish, although paler than the back. The paws and claws are black or nearly so, and the ears are much darker.

I exhibit a skin of the red-footed animal, being that of the second male, received in October, 1870. Of this form we have also had another individual, brought by Mr. A. M. Sandbach from British Guiana in June 1872. All other examples of this animal previously in the Gardens have belonged, I believe, to the black-footed form.

Upon these facts I come to the conclusion that there are two forms of *Procyon* met with in South America—the red-footed, from Guiana and Columbia, up to Colon, and the black-footed, *probably* from S.E. Brazil and Paraguay. As Cuvier's *Ursus cancrivorus* is founded on the animal of Cayenne, the northern red-footed animal must retain the original specific term, and the southern black-footed form will probably require a new name.

7. *CERVULUS MICRURUS*, sp. nov. (Plate LI. fig. 1.)

The series of Muntjacs (*Cervulus*) in the Society's Collection has been largely augmented during the past year; and we have now living in the Gardens no less than 12 specimens of the different forms of this animal. I will say a few words on each of the species, taking them in the order given by Sir Victor Brooke in his excellent article on this genus*.

(1) *Cervulus muntjac*—Of this species we have a male obtained from the Jardin d'Acclimatation in November last, and a pair purchased in March last. It will be observed on comparison, how much larger and brighter in colour the Burmese male (from Saigon) is than the male of the pair subsequently purchased, which probably represent the ordinary Indian form of this species.

This leads me to believe that Sir Victor Brooke's suspicions as to the specific distinctness of the Indian and Burmese forms are very likely to turn out to be correct.

* P. Z. S. 1874, p. 33 *et seqq.*

(2) *Cervulus sclateri*.—Of this large Chinese species we have two males, both purchased of Mr. Edward Bartlett in May, 1874. These animals were sent to Mr. Bartlett from Ningpo by Mr. A. Michie.

(3) *Cervulus reevesi*.—Of this smaller Chinese form we have a male purchased of Mr. L. Fraser in 1867, which was originally obtained in Formosa by Mr. Swinhoe, and a female presented by Mr. A. Michie in September, 1873, which that gentleman assures me came from Ningpo.

The pair bred in the Gardens last year; and a young one was born July 13, which is now consequently about a year old. They bred again this year; and a young one was born on May 27th, of which I exhibit a sketch by Mr. Smit (Plate LI. fig. 2) taken on June the 6th, when the animal was about ten days old. This drawing shows that the young *C. reevesi* is spotted, a point hitherto undecided.

More recently we have received a young pair of this species from Formosa, presented by W. P. Galton, Esq. (Nov. 17, 1874); so that we have now 5 specimens of it.

(4) *Cervulus micrurus*, sp. nov.—Under this name, as a temporary designation at all events, I am compelled to separate two Muntjacs, both received from China last year and purchased of Mr. E. Bartlett. The female (received Feb. 27) was sent from Ningpo by Mr. Michie; and the male (received May 29) was, as that gentleman informs me, transmitted by him from Hong-Kong. But he believes that this individual or its parents came originally from Formosa.

This Muntjac is of nearly the same size as Reeves's Muntjac, and generally resembles that species, except as regards its very short and almost rudimentary tail. At first I suspected this appendage might have been clipped; but, so far as we can tell from examining the living specimens, this is not the case; and Mr. Michie is likewise of opinion that the present state of the tail is natural. There are likewise several minor differences which distinguish these animals from *Cervulus reevesi*, such as the slightly smaller stature and white rings round the feet. But I am far from considering the species satisfactorily established until an anatomical examination of the specimens has been made.

EXPLANATION OF THE PLATES.

PLATE XLVII.

Young female of *Macacus speciosus*, presented by Mr. Abel A. J. Gower.

PLATE XLVIII.

- Fig. 1. Light-grey variety of *Ateles melanochir*, from one of two female specimens from Nicaragua, presented by Mr. S. Wilton Rix, July 31, 1874. (*A. albifrons*, Gray?)
2. Rather darker variety of ditto, from a specimen purchased October 18, 1874.

PLATE XLIX.

- Fig. 1. Still darker variety of *A. melanochir*, from a specimen presented by Mr. H. Campbell, January 4, 1875.
2. Dark variety, with rufous front and belly (approaching to *A. ornatus* of Gray), from one of two male specimens deposited by Mr. H. B. Whitmarsh, August 14, 1873.

PLATE L.

Hapale melanura ♂, from a specimen purchased November 9, 1874.

PLATE LI.

Fig. 1. *Cervulus micrurus* ♂, from the specimen received May 29, 1875.

2. Young female of *Cervulus reevesi*, born in the Gardens May 27, 1875, from a sketch taken by Mr. Smit, June 4th. [P.S. On June 28th the spots were nearly obsolete.]

8. Notes on Fijian Birds. By EDGAR L. LAYARD, F.Z.S.*

[Received May 18, 1875.]

The following notes on the birds of Fiji are offered to the Society, not as contributing any thing very new, but as the result of one year's residence in the group. Continued and harassing official duties, in the difficult and trying position in which I have been placed, have prevented me from doing more than to devote a moment here and there to ornithology as a relief to the mental strain on me. No one but he who has experienced it can appreciate the relief to turn from official squabbles and the pettinesses, heartburnings, and jealousies of a small community to the tranquil study of Nature. Small and infrequent have been my chances here; and I am indebted to one of my servants for the majority of the specimens I have obtained, and for much of the information I have acquired.

My visits round the islands have always been official, and performed in a man-of-war, the routine of which prevents collecting to any extent. Moreover I find that age is creeping on me, and I cannot now scale the hills as I used to do without fatigue; and on Ovalau we have nothing but hills, among which dwell the only birds really worth seeking. The whole country, however, is singularly destitute of birds. My butler, who was very active, would start before daylight, so as to reach the summit of the island by the earliest dawn, and then descend about eleven or twelve o'clock. He never brought down more than *ten birds* on any occasion, and assured me he shot all he could. Pigeons may be heard all round, but they are very difficult to see; they are the commonest of all our birds. I have gone up once or twice, and sat at the foot of a tree in full flower or fruit; and in an hour perhaps two or three birds would come to it, chiefly *Zosterops*!

Our seaboard is the same. As I write I look over a waste of waters unbroken by the white wings of the lovely and graceful Terns or snowy Gulls of the Cape, or India, or Europe. No strings of black Cormorants break the brilliant green of the circling reef; the shrill call of the Curlew and the pipe of the Plover are sounds unknown on our shores!

One would have thought that

"Amid the green islands of glittering seas"

* [See, for previous papers on this subject, "Ornithological Notes from Fiji, with Descriptions of supposed new Species of Birds" (P.Z.S. 1875, p. 27), and "Descriptions of some supposed new Species of Birds from the Fiji Islands" (P.Z.S. 1875, p. 149).—ED.]

myriads of sea-fowl would find a congenial home; such, however, is not the case here, and I have never yet resided on a coast so utterly desolate.

The avifauna, as given by Finsch and Hartlaub in their 'Ornithologie der Viti-, Samoa- und Tonga-Inseln,' comprises sixty species found in the Fijis. I have added several to this list, and *Lamprolia victoriae* and *Chrysæna victor* must be included. I suppose seventy species may be set down as the number inhabiting an area of 7400 square miles, but scattered over a space *five times* as large as Wales! Compare it with the island of Jamaica, which has an area of 6490 square miles in one block, and its known species amount to at least 220.

It is probable that a few new species may turn up, now that the mountainous interior will be opened to travellers. Taviuni also has not been well worked; nor have some of the small islands, such as Moala and Totoya to the south-west: but I do not expect much from these latter; they are too small.

ASTUR CRUENTUS, Gould; F. & H. *op. cit.* p. 3.

This Hawk is not uncommon, and widely distributed throughout the islands. It feeds chiefly on Lizards and *Mantidæ*, but will not disdain a bird occasionally. Finding that the young of our domestic poultry are easy of capture, it often makes raids on the planters' homesteads, till vengeance overtakes it in the shape of a charge of shot. It builds in large trees, making a coarse nest of twigs, and lays two to four eggs, axis 1" 9", diam. 1" 5", of a dirty white colour, more or less clouded, blotched, or spotted with dark dry blood-coloured marks. They vary considerably, some being only clouded, others generally spotted, others spotted in a ring round the major diameter; some are almost pure white, with very tiny freckles of colour sparsely distributed. They seem to breed over several months; or else the same pair have two broods. Fresh eggs have been brought to me in February and May, and hard-set ones in the same months. I have reared nestlings from the downy stage by feeding them on raw meat; they uttered a shrill stridulous cry, similar to that of the adult birds, but not so loud. Iris, legs, and cere of the bill in the adult a fine bright orange; tip of bill and claws bluish. In the young the iris is brown.

CIRCUS ASSIMILIS, Jard. et Selb.; F. & H. *op. cit.* p. 7.

Frequents open grassy lands and swamps, and, I am told, mostly feeds on grasshoppers and such like, though it will occasionally carry off a young chicken. I have seen it abundantly at Suva, Naudi, and Ba-river district; also on the sugar-plantations on the Kewa, on Wakaia, and very sparingly on Ovalau. Beats its ground like the English Harriers.

STRIX DELICATULA, Gould; F. & H. *op. cit.* p. 11.

Not often seen, but, I am told, widely distributed. A single specimen in my possession was sent me from the Kewa, on which river

my son saw it hunting over grassy land, like the English Barn-Owl. I also have it from Ovalau.

PLATYCERCUS TABUENSIS (Gmel.); F. & H. *op. cit.* p. 17.

Non vidi.

PLATYCERCUS SPLENDENS, Peale; F. & H. *op. cit.* p. 20.

Common on Viti Levu, Vanua Levu, Kandavu; none on Soma, Loma, Mango, Thithia*, Munia, Naitamba, Ovalau, Wakaia, and Mokauai. I am inclined to think the Taviuni bird is either distinct or a local variety. It has more *brown* in its colour, some that I have seen being almost of a chocolate-crimson. Breeds in holes of trees, and lays two eggs, white, or so much stained as to appear reddish. I am not sure how this stain arises, whether from the parent bird or the bark with which the nest is lined. It occurs also in eggs of *P. personatus* to such an extent that I mistook some eggs sent me for those of *Astur cruentus*, until assured by my correspondent that he had only taken those of the Parrot. Axis 1" 5"', diam. 1" 2"'. They are very noisy in their flight, and generally ramble about in small companies from five to ten in number, feeding on wild fruits and berries; in some places they do much harm to the fields of maize and sugar-cane. The natives account for the want of Parrots on Ovalau, Wakaia, and Mokauai, by a tradition that a god in the shape of a large serpent dwelt on the latter island, and wandered about, serpent-fashion, during the night. Of course he slept during the day, and his early morning slumbers were disturbed by the cries of the "early birds" among the Parrots; he therefore issued an edict that they were all to die off these islands; and die they did! He exempted the "Kulas" (*Lorius solitarius*, Lath.) from the ban, as their voices are not so loud; and therefore "here they dwell unto this day." The native name of both is "Kau-kau," or "Kaka," and on the Kewa "Ka-Ndamu," according to Mr. Storck.

PLATYCERCUS PERSONATUS, G. R. Gray; F. & H. *op. cit.* p. 21.

The same remarks as to distribution may be made with this species as with the last, except that since the annexation of these islands my butler, who has been collecting for me in the upper ranges of this island (Ovalau), tells me he has several times seen a small party of these birds, evidently "quite at home." Perhaps they are aware that the old days have passed away, and that under the British flag "liberty" and "equality" flourish; and so they have determined to set their old enemy the serpent at defiance, and come to reinhabit the homes of their ancestors. It will be interesting to note if the little new colony flourishes.

* I spell the names of these places as they are pronounced, and not in the absurd fashion introduced by the missionaries when reducing the language to writing. According to it, every D and G has an N before it, more or less sounded; and Th is represented by C. Thus, Mang-o (the g belonging to the first syllable) is written Mago, and Thithia = Cicia. All the vowels in Fijian have the Italian sound: k stands for the hard c, as in "cat."

This species is characterized by possessing a musky smell, resembling that of a he goat. I supposed it originated from the trees in the holes of which they breed; but having obtained some very young birds, I noticed they did not smell. Since, however, that they have attained their full plumage the odious scent has come to them. They are easily reared, become very tame, and may be trusted with their liberty, foraging for themselves in the forest, and returning to roost to their old nursery. A young lady of my acquaintance has two which thus fly at liberty; and my own birds keep to the house, and never dream of flying away. In certain lights their plumage is shot with a beautiful golden sheen, which becomes dim in a dead specimen. The iris changes from brown in the nestling to a brick-red with a dash of orange in it in the adult; the bill is dark horn-colour, with a whitish tip; the feet livid black. In habits they resemble the former species, and keep to the same description of country, forest and wooded river-banks. Breed in holes of trees, and lay two eggs; axis 1" 6"', diam. 1" 3"'. Called "Vanga" at Bua (*Holmes*).

The nestling of this Parrot is green above, feathers here and there tipped with white down; black on the face scarcely showing. Body covered with black down, with a row of bright yellow feathers changing into orange on the belly and vent on each side; outside the yellow cere a few green feathers appearing. Bill horn-colour, with the edges, tips, and bases of mandibles orange. Thighs nearly naked. Tarsi livid. Iris brown.

LORIUS SOLITARIUS (Lath.); F. & H. *op. cit.* p. 23.

This lovely little bird, called "Kula" by the natives (and *solitarius* by Latham, "*because it is never seen alone*"), is found throughout the islands, its favourite food being the flowers of the *Erythrina* when in bloom, or those of the cocoa-nut when others fail. The collector, if he wants these little beauties, need only seek some tree in flower on which they feed, and sooner or later every flock in the district will visit it. I have heard of sixteen being killed off one tree in a morning's shooting. They are trapped in great numbers by the natives for sale to the Tongans and Samoans, who periodically pluck them, their crimson feathers being much used for ornamentation. Europeans find much difficulty in keeping them alive, even for a short period; but I am told the native girls chew sugar-cane and berries, and allow the birds to feed from their lips.

CUCULUS SIMUS, Peale; F. & H. *op. cit.* p. 28.

This rare Cuckoo was obtained (a single specimen) by the 'Challenger' Expedition at Kandavu early in August; two individuals were killed on Taviuni by Mr. Liardet in November; and Mr. Storck procured for me a pair consisting of a young male and a female in January 1875. He says they frequent the darkest, densest portion of the forest, and only betray their whereabouts by their whistling notes.

CUCULUS INFUSCATUS, Hartl. ; F. & H. *op. cit.* p. 31.

A single specimen of this sombre-coloured Cuckoo was shot on "Brewer's Rock," a large mass of pudding-stone at the back of my residence, in the month of February. Mr. Kleinsmidt captured a specimen in his garden in January.

Both these Cuckoos are migratory, arriving in these islands at the end of the year. They are considered very rare ; but I suspect this is owing to their retiring habits, and their frequenting the depth of the forest.

EUDYNAMIS TAITIENSIS (Sparrm.).

Non vidi.

CHALCITES, sp. inc.

Mr. Henry Thurston, a gentleman who has devoted some attention to birds both in Australia and Fiji, assures me that he has shot the little "Bronze Cuckoo" of Australia on Taviuni. He knows the species well, having skinned many of them.

HALCYON SACRA (Gmel.) ; F. & H. *op. cit.* p. 32.

This Kingfisher is one of the commonest birds in Fiji, being found along the whole seaboard, and inland up the rivers. It feeds on crabs, fish, lizards, locusts ; in fact, few living things that can go down its throat are rejected. It perches equally on the stones left bare by the retreating tide, and on the topmost branches of the tallest forest-trees. I have often, when in the latter situation, mistaken its cries for those of *Astur cruentus* on the wing. The natives call it "Sé-sé," and declare that it builds in ants' nests on the trees, laying four to six eggs (pure white, axis 1" 1", diam. 1"), chiefly in November and December. The white ants of this country construct nests in hollow trees ; and it is in these scooped out that these birds are said to breed. Kleinsmidt says in Ovalau it is called "N'lé-sé."

HALCYON CASSINI, F. & H. *op. cit.* p. 40.

I obtained a single specimen of this Kinghunter on the Waimanu branch of the Rewa. It was on a tree in the forest at the back of Mr. Thomas's plantation.

CAPRIMULGUS, sp. inc.

I have been assured by the natives on Koro that a bird exists on their island "which has the power in the evening of turning itself into a stone, and lying in the footpath till you almost tread upon it, when it flies up into your face. It has large eyes and a huge mouth, for the purpose of catching the rats on which it feeds." Divest this of the miraculous and the misconception as to the use of the "huge mouth," and you clearly have a Goatsucker indicated. I asked if they knew the Owl. "Yes ; they knew that bird, but it was not that."

COLLOCALIA SPODIOPYGIA (Peale); F. & H. *op. cit.* p. 48.

This little brown Swift is about the commonest bird throughout the islands, frequenting equally the seaboard and the whole of the inland country. Wherever I have been I have seen it whirling about in pursuit of the tiny insects on which it feeds. It rarely comes within gun-shot, except towards the evening; and then in the uncertain light it often dashes past singly, never in flocks. I never heard it utter a sound.

My son Mr. L. Layard, while on a collecting-trip to the windward islands of this group, heard of several caves in the limestone that prevails there, in which these birds were reported to breed. He writes as follows:—

“Before I left England for Fiji in September 1873, I had heard a rumour that the edible-nest-building Swift was found in a cave on one of the islands, and determined to verify the truth if ever I had the chance. In November last I made a trip to the ‘Windward Islands,’ for the purpose of obtaining some specimens, and to see if the country was suitable for the growth of sugar-cane, which a good many of our unfortunate planters are trying; now that the cotton market has failed them. While at Loma Loma, Mr. Hennings asked me to visit a small island of his, named ‘Katafango,’ on the extreme outer edge of the Fiji group, where, he said, was a large cave, inhabited by a number of ‘small Swallows,’ and he was anxious to know whether the nests were the edible ones or not. Of course I was eager to start at once; but as no vessel was going that way just then, I went to another island named Cicia, where a second ‘Swallows’ cave’ was reported to be.

“I found this cave in the face of a great ridge of limestone cliffs, which formed a sea-wall several miles in length on the estate of Mr. Lennox. There were two entrances to this cave, the one on the ground-level being a deep groove parallel with the sea-shore, and terminating in an immense dome-shaped chamber, tenanted by the birds I was in search of. This chamber was almost circular, about 90 feet high and 120 feet across—with a small round hole, about 6 feet in diameter, halfway towards the roof, looking to the sea, which was the only entrance used by the Swifts, but inaccessible to man. There were a great number of birds flying about the roof, and in and out of their entrance. They kept up a continual low twittering note, such as I had never heard before; and I noticed that they did not venture more than a few yards beyond the mouth of the cave. The ground was thickly covered with guano, like fine black flour, the depth showing that the birds must have frequented the place for a long period. Not having a gun, I could not obtain any specimens; neither could I get any nests, though I fancied I could dimly discern some on the roof by the light of the old coconut-leaf torches we carried. I saw the birds were new to me, and asked Mr. Lennox to shoot some, and send them to us in spirits at his earliest convenience.

“In the middle of December I visited an island named Mango, the property of Messrs. Ryder brothers, and within sight of Cicia. This

island is an enormous mass of crystallized limestone, and has also a cave in which the Swifts breed. Like Cicia, this cave is in the limestone cliffs running parallel to the sea. In the face of these cliffs is a small ravine, just a series of sharp-pointed blocks of stone, and a tangled mass of immense 'lianes' and monkey-ropes. Up this place, in company with Mr. T. Ryder, I had to make my way, and almost cut a new pair of shoes to pieces doing so. The mouth of the cave is about 100 yards up this ravine. It is small, not more than 10 yards in diameter, but opens at once into an immense hall, exactly like a theatre. On either side are the galleries, with pillars, composed of stalactites extending from roof to floor. Below is the pit, and opposite the entrance a level platform for the stage. The setting sun shone in at the entrance, and filled the whole place with a beautiful bright green light reflected from the limestone walls around. This place had evidently been used as a fortification during the troublous times of ancient Fijian history, as the mouth of the cave had been considerably lessened in width by carefully piled up walls of stones. Indeed ten years ago, a little after Mr. Ryder took possession of the island, and before he was aware of this cavern, a band of predatory Fijians from another island, whom he was pursuing, escaped him by taking refuge in it. One of them afterwards told him that as he and his men passed down the ravine, they lay behind the stone wall, with their muskets cocked and pointed. But to return to my subject. Descending from the galleries, we crossed the pit, ascended the stage, and passed into a low and narrow passage, along which it was frequently necessary to go on all fours. The twittering of the Swifts, roused by our torches, now became audible, as they dashed past us; and the ground was covered deep with guano. Occasionally, too, a gaping black cleft would appear across our road, compelling us to travel very circumspectly. After about 40 yards of this work, the passage suddenly opened into a second immense circular hall, with stalactites hanging in every direction. This was evidently the main home of the Swifts; and I could see their nests all about, with the birds sitting on them apparently dazzled by the light. It was the height of the breeding-season, and from most of the nests two little bare heads and necks were hanging out, completely bewildered by their first sight of light. Balancing myself on one foot on the sharp point of a stalagmite, and supporting myself with one hand against the cavern-side, I managed to secure my first nest. Below me, over which I reached, was a black chasm, very narrow but very deep, and which I did not care to look into too particularly. Taking the bird off, to my great delight I found two glistening snow-white eggs. The bird, a female, I then killed. By some alpine scrambling about damp and precipitous ledges, we got into several little chambers close by the roof of the big hall, which contained numbers of nests. In only one more nest, however, did I find any eggs; every one contained two callow young. If I had arrived a fortnight before, I should have made a great haul. The nests were composed of the long stringy leaves of the iron-wood tree (*Casuarina*) gummed together, and fastened to any slight pro-

jection of rock. One nest only did we find in which the leaves, after completing the circle, had been allowed to hang from the front, forming a complete 'beard.' The nests of these Swifts at one place must have been fully 150 yards underground. Mr. Ryder assured me he had penetrated for another 100 yards, till he dared not go any further, as he arrived at a shelf with a very steep incline downwards to an unknown depth; the Swifts were still nesting as far as he went. I was too much occupied in skinning doves to make another visit to the cave; but I believe that these Swifts are *night-flying birds*, as I never saw any outside the caves until we disturbed them, and then they never ventured further than a couple of yards from the entrance. Mr. Hennings told me also that a bird he caught in the Katafango cave, when let loose in the house, kept flying against the furniture, as if blind. The neighbouring planters, too, say that they never saw the bird anywhere except in the caves.

"I did not visit Katafango, as I had found the same bird on two islands, and I did not consider it likely there would be another species on an island within sight of the other two. Moreover I had had enough of Fiji 'ten-ton cutters'! There were also some very small bats in the cave. On Mango Island I procured specimens of *Carpophaga latrans* and *C. pacifica*, *Columba vitiensis*, *Ptilinopus perousei*, and *P. fasciatus*."

Mr. L. Layard's notion of their being "night-flying" birds is, of course, erroneous to a certain extent, as I see them every day flying in the sunshine; but what instinct guides them to their nests in the dense darkness of the vast underground caverns in which they breed?

Mr. L. Layard brought two nests, composed entirely of the thread-like leaves of the *Casuarina* agglutinated together; diam. 2" 3", depth 1". They have evidently been glued on to shelving rocks, and in one the long filaments have only been fastened at one end, the other hanging down some 8 or 10 inches, like a "beard." The eggs are pure white, of an obtuse oval; axis 8", diam. 6".

COLLOCALIA VANICORENSIS (Quoy et Gaim.); F. & H. *op. cit.* p. 47.
Non vidi.

HIRUNDO TAHITICA (Gmel.); F. & H. *op. cit.* p. 51.

This Swallow is very local, but, I think, widely spread throughout the islands. It is said to nest in rocks; and I feel confident a pair nested this year in the cracks and crannies of "Brewer's Rock," as they were visible almost every evening during my residence in my present house, flitting over the little point of land on the other side of the creek, and in front of my veranda. They are very crepuscular in their habits. I saw them in the hills as far up the Rewa river as Naruku-ruku, mingled with the Swifts also at Kandavu, Loma Loma, and Taviuni.

Bill black; legs black. Iris dark brown. Feed on minute insects.

ZOSTEROPS FLAVICEPS, Peale; F. & H. *op. cit.* p. 52.

This little "White-eye," called "Gingi" by the natives, is gene-

rally distributed. It nests in low bushes; and many of its "procreant cradles" have been brought to me, but never any thing like that wonderful structure figured by Finsch and Hartlaub in their 'Ornithologie.' That must be quite abnormal, I should fancy. All I have seen resemble those of the species inhabiting Ceylon and the Cape of Good Hope, being composed of moss, fine fibres, cobweb, &c., and lined with the fine black rootlets of some plant. They are usually placed in the upright fork of two or more twigs, and vary in depth outside according to the angle of its supports. The eggs, three to four, are turquoise blue; axis 8", diam. 6". In habits it resembles the "White-eyes" of other countries. Mr. Storck writes, "very destructive to imported as well as native fruit." Bill and legs very pale livid brown; lower mandible almost white. Iris pale grey brown.

ZOSTEROPS EXPLORATOR, Layard, P. Z. S. 1875, p. 29.

Resembles *Z. flaviceps*, but is yellow, not grey, on the chest.

One specimen only was obtained; and before I could obtain a detailed description of it, it was packed away for transmission to Europe.

Kandavu (*H.M.S. 'Challenger'*).

MYZOMELA JUGULARIS, Peale; F. & H. *op. cit.* p. 54.

This little bird replaces in these islands the *Nectarinia* of India. Any person conversant with the one would, on first seeing and hearing these birds, fancy he had before him some of his old friends. They abound about the cocoanut-trees, eagerly searching their flowers for minute insects; they are also found in the forest region, at the greatest altitude that I have been. Like their prototypes, they are very quarrelsome, chasing each other with shrill cries, darting and turning about among the foliage, often grappling in the air, and falling a considerable distance before they disengage from their struggle. Young birds want the red on the head and rump. The natives call them "Dreui-n'dela-kiela." Bill black; legs dark livid; soles of feet yellow; iris grey brown. ♂, full breeding, 1.175 inch. Native name "Keri-keri-sai."

MYZOMELA NIGRIVENTRIS, Peale; F. & H. *op. cit.* p. 56.

Non vidi.

PTILOTIS PROCERIOR, F. & H. *op. cit.* p. 62.

Common on some of the islands, viz. the north of Viti Levu, Ovalau, and Waikaia; on Kandavu mingled with the next species, sparingly; on Loma Loma replaced, as far as I yet know, by what I take to be *Ptilotis carunculata*, or a new species. In common with the others it has a loud clear ringing whistle, which is chiefly heard in the early morning or the afternoon. It is very partial to the cocoanut-trees, hunting for insects amid the flower-sheaths; but it is also found on the Iri trees and others, though not commonly in the forest proper.

Nests composed of coarse rootlets slightly woven, so that the eggs may be seen through against the light, and lined with finer rootlets, and even the hair of animals; generally placed in the fork of a branch. Diam. 3", depth 2". Eggs three to four, axis 1", diam. 9", delicate pink (fades rapidly), speckled, chiefly on the obtuse end, with dark pink spots. It breeds in October, November, and December, in each of which months eggs have been brought to me*.

Bill black; legs dirty green; inside of feet yellow; iris dark brown. Male considerably larger than female: in full breeding-storgy 1 to 1.75 inch.

PTILOTIS CARUNCULATA (Gmel.); F. & H. *op. cit.* p. 58.

This *Ptilotis* is, as far as I yet know, confined to Loma Loma, where my son shot it in the middle of December, showing no signs of breeding. He was for some time on Mango and Thithia, and neither saw nor heard it; neither did I in my flying visit in the early part of the year, though I heard a species on Loma Loma, and indeed in most of the other places at which we touched; but my time was too limited, and otherwise engaged, to enable me to collect any thing. My son found it frequenting the flowers of the "Ndilo" trees, extracting minute insects.

PTILOTIS PROVOCATOR, Layard, P. Z. S. 1873, p. 28.

This new species seems confined to the island of Kandavu, the southernmost of the group.

In habits, call, &c. it resembles *P. procerior*. I found it frequenting the *Erythrina* trees, in flower during my visit there, hanging about the blossoms in every conceivable position for the purpose of probing the flower-tubes in search of honey and insects.

TATARE? VIRIDIS, Layard, sp. nov.

General colour throughout a uniform olive-green, tinged with yellow. Inner webs of primaries very dark green; outer webs golden green; shafts of wing- and tail-feathers black. Underside of wing pale buff; plumage somewhat lax; bill and legs bright orange; bill 1" 10", much curved. Tarsi 1" 6"; legs strong, largely scutellated in front, none behind; claws dark, hook-curved, and sharp. Total length 10"; wing, 5" 2". Tail-feathers pointed. First quill of wing half length of third; second quill much shorter than third, which is shorter than fourth; fourth, fifth, sixth equal; seventh and eighth graduated. Tail 5".

Found at Taviuni by Mr. Liardet. Said to "creep" on trees. I know nothing of it personally.

LAMPROLIA VICTORIÆ, Finsch, P. Z. S. 1873, p. 735, pl. lxii.

This singular bird is confined to a mountain-range on the north of Taviuni. Mr. Liardet, in a late expedition, procured several specimens. From his description of its habits I should be inclined to

* Mr. Kleinsmidt had a nest of young ones in his garden, fully fledged in the first week in February.

place it near the "Chats" (*Saxicolinae*), the curious white upper half of the tail helping me to this idea. Mr. Liardet says the natives call it "Wali-na-koli," which means "the dog cannot catch it," in allusion to its habit of running on the ground, and, when pursued by the dog, flying up just out of reach. It is only known to the natives in its immediate vicinity.

MYIOLESTES VITIENSIS, Hartl.; F. & H. *op. cit.* p. 71.

This bird frequents the forest, never coming near the haunts of men. It ranges high up in the mountains, being found about the summit of Ovalau (2000 feet). It feeds on insects, which it tears to pieces, like a Shrike (not, however, spiking them). Iris brown; bill black; base of commissure yellow; legs blue.

MYIOLESTES MACRORHYNCHA, Layard.

This bird was shot on Taviuni by Mr. Liardet. I know nothing of its habits, except that it frequents the forest, and feeds on insects.

PACHYCEPHALA GRAEFFEI, Hartl.; F. & H. *op. cit.* p. 72.

If I am right in the identification of these birds, the species inhabits the forest in high mountain-ranges. It is oftener seen than shot, being of a most restless disposition, ever on the move, and never remaining quiet on a branch for a moment. It feeds on insects, darting at them on the branches, leaves, or in motion with equal success.

PACHYCEPHALA VITIENSIS, G. R. Gray; F. & H. *op. cit.* p. 73.

A single specimen (♀) of this bird only, obtained near the summit of the mountains on Ovalau.

PACHYCEPHALA TORQUATA, Layard, n. s.

Upper part back, wings, and tail very dark, almost black, shaded with dark olive-green on the outer edges of all the wing-feathers and back, the tips of the tail-feathers being pale. Head above black. All the underparts of the body bright orange; the gorget crossed by a broadish crescent-shaped black collar. At back of the neck (nape) an indistinct orange collar (*specimen badly preserved*). Undersides of wings and tail lighter than above; the inner edges of the secondaries buff; tip of tail much paler. Length circa 7"; wing 3" 10"; tail 3"; tarsi 1"; bill 11". Bill black; legs horn-colour.

Taviuni. Liardet (♀ red brown, paler below). "Kulu-oso" of the natives. A bird answering to this description pretty well was shot by Pearce on Ovalau, December 28th, 1874. Iris dark brown; bill black; legs brown. Length 6" 6"; wing 3" 10"; tail 3"; tarsi 1"; bill 10". Pearce's specimen, however, is not so yellow, nor is the collar so broad; the colour of the back also differs.

LALAGE TERAT (Bodd.); F. & H. *op. cit.* p. 80.

The bird that I take to be this species I have only found in the state described by Drs. Finsch and Hartlaub as being immature.

Nevertheless, I have procured it all the year round; and from all parts of the group. It is called by the natives "Manu-sa." It frequents the Iri and Ndilo trees near the beach, and low scrub or high trees in the forest. Upper mandible bluish black; lower pale yellow with dark tip; legs bluish; iris dark brown. The natives declare it assumes no other phase of plumage; and I have certainly killed it all the year round, and found it with largely developed testes, but never saw any other.

ARTAMUS MENTALIS, Jard.; F. & H. *op. cit.* p. 84.

This "Wood-Swallow" is so eminently like a Martin (*Hirundo urbica*) in its appearance and manner of flight that, in my first acquaintance with it on the wing, I shot it under the full impression that it was a Hirundine. Great was my astonishment, therefore, to pick up a "Wood-Swallow." It is very local, a pair frequenting a favourite tree, and suffering no rivals near their throne. Even their young ones are driven off after a certain time. A pair at the Dépôt at Thawathi attacked a Cockatoo from the Solomon Islands (that flew at large about the house) in a cocoanut-tree, near which they built, and pecked out his eyes. I have been credibly informed they will attack and kill small half-grown fowls. The natives call it "Ndree," and on the Rewa "Vutiasé."

RHIPIDURA ALBOGULARIS, Layard, P. Z. S. 1875, p. 29.

♀. Upper parts above very dark black brown, tinged with a warm reddish brown on the rump and back; eyebrow, chin, and throat white; underparts greyish, more or less longitudinally striped with black and white, and tinged on the belly and vent with isabella colour. Primaries dark brown; secondaries faintly edged with reddish brown; tertiaries and coverts edged and tipped with the same. Tail-feathers dark brown, all but the four central broadly tipped with white. Bill black; lower mandible white at the base, with dark tip; bristles of bill black, and exceeding it in length. Legs blackish brown. Iris brown. Length 6"; wing 3"; tail 3" 6''; tarsus 10"; bill 6''.

This pretty little "Fantail" Flycatcher is found in the forest that clothes the island of Ovalau; elsewhere I have not seen it. It generally hunts in little families of three or four individuals, and darts at insects at rest on the leaves or twigs. I fancy also I have seen them dart upon and capture insects on the wing, when near them on the bush; but their actions are very quick, and I am not sure of it. They frequently elevate and spread their tails, and are pugnacious little fellows, fighting fiercely with their companions.

MONARCHA LESSONI (Homb. & Jacq.); F. & H. *op. cit.* p. 88.

This little bird, clothed in quiet grey, like a demure Quaker girl, is an active bustling little body, roaming about in flocks, busily scouring branches and leaves for its favourite food, small insects. I found it commonest at Ngaloa Bay (Kandavu), but came across it in almost every other part of the colony. Iris brown; bill and legs blue.

MYIAGRA CASTANEIVENTRIS (J. Verreaux); F. & H. *op. cit.* p. 95.

This Flycatcher is common throughout the islands; and its shrill note may be heard in every situation. Nests said to belong to this bird have been brought me from many localities; they precisely resemble that figured by Drs. Finsch and Hartlaub as the nest of *Ptilotis carunculata*, being beautiful compact cup-like structures made of fibres and rootlets (horsehair and cowhair being even used in some localities for lining), and covered outside with pieces of lichen most beautifully stuck in, so as to resemble a knot on a branch. They are generally placed on a drooping branch, or in a fork, and are about 2 inches in diameter, and $1\frac{1}{2}$ deep. One nest was placed in the bend of a drooping bough, and from below looked a mere excrescence. They build in bread-fruit trees, *Casuarina*, and, in fact, on almost everything suitable. Mr. Storck writes that they are capital watchers, giving warning of approaching hawks. Eggs said to be blue.

ERYTHRURA PEALEI, Hartl.; F. & H. *op. cit.* p. 99.

This queer little Amadavat has not occurred to me personally, but has been sent me by my kind contributors, Messrs. Storck and Abbot, from the Rewa. The former writes, "Feeds on grass and other seeds, and minute insects. Native name 'Sithi.' Iris and bill black; feet and legs a dull pink. *E. pealei* occurs sparingly at Bua, on the north coast of Vana Levu; was procured there by Mr. Tempest." Kleinsmidt says, "called there Nrisi." I saw on the plantations on the Navua river, Viti Levu, a small *Amadina*? in flocks, that may have been *A. optata*; but that is not as yet known from any island in the Fiji group.

APLONIS TABUENSIS (Gmel.); F. & H. *op. cit.* p. 103.

This sombre-coloured bird seems pretty generally distributed. I obtained it at Randavu and Suva; Messrs. Storck and Abbot on the Rewa, my son on Loma Loma, Mr. Liardet on Taviuni. It is said to nest in the mangrove scrub; and a nest with slightly hard-set eggs, brought me from Wakaia (December 26th, 1874), was a loose structure, composed entirely of the fibre-like frond of *Casuarina*. Internal diam. 3", external 5"; depth 1" 9". Eggs blue (pale), and generally spotted with purple-brown spots. The natives on the Rewa call it "Kikaw."

MERULA VANICORENSIS (Quoy & Gaim.); F. & H. *op. cit.* p. 97.

Unless my memory much deceives me, this bird was shot on Kandavu by Dr. Goode, of H.M.S. 'Dido,' in August 1874.

PTILINOPUS PEROUSEI, Peale; F. & H. *op. cit.* p. 110.

This most lovely Dove, called by some the "Nutmeg Dove," seems pretty generally distributed, as I have seen it in, and received it from, Kandavu, Rewa (on Viti Levu), Ovalau, Wakaia, Mango, and Bua (on Vanua Levu). I obtained eggs of it hard-set on October 7, 1874, and young birds just beginning to assume the purple of the

forehead in December. The eggs are pure white, rather pointed at one end; axis 1" 4"', diam. 11'''. The natives say the two eggs are always male and female. Its favourite food, as in others of the genus, is the seeds of the Banian; but it will swallow fruits of very large dimensions; I have, in fact, seen hard seeds bigger than nutmegs taken from its crop. The young bird and the female are green, with the vent-feathers magenta-coloured; the edges also of the wing-feathers and secondaries are yellow. It appears to me that Drs. Finsch and Hartlaub have figured the young male or a female of the next species for the young of this. I have never seen *Pt. perousei* with yellow vent-feathers and a barred tail. Mr. Storck writes from the Rewa that the native name is Sanakulu or Kuluvotu. "Feeds on the berries of the Banian tree, the *Loxanthus*, or rat-mistletoe, and the unripe seeds of the Mavu tree (*Euphorbia*), and is more or less gregarious." Mr. R. L. Holmes, of Bua, gives the native name of the bird as "Bune-solove."

PTILINOPUS FASCIATUS, Peale; F. & H. *op. cit.* p. 115.

This beautiful Dove is very abundant in Wakaia, breeding there in December. The eggs are pointed at one end, like those of the preceding species; axis 1" 4"', diam. 11'''. Like them also they nest in low trees in the forest, making a rude structure of twigs. The voice of this bird is just like that of the Turtledove, and at once attracted my attention. My son, too, hearing it on Mang-o (where it seems equally common), at once recognized its likeness to the voice of Turtledoves at the Cape. It must be local in its distribution, none having come from the Rewa; nor did we get it on Kandavu; nor in the course of my visit to Viti Levu or Taviuni did I hear of it.

The female exactly resembles the male, the dark purple spot on the stomach being perhaps less *prononcée*. The birds of this species are of a yellow buff colour, and the legs crimson, the bill green.

CHRYSÆNA LUTEOVIRENS (Homb. & Jacq.); F. & H. *op. cit.* p. 134.

The "Golden Dove" of the settlers is an inhabitant of the forest-covered parts of the island of Ovalau and the Rewa. It is in full breeding-plumage during the months of October, November, and December, the testes of the male being enormously developed. The female and young males are green. Eggs brought to me by the natives as belonging to this species are, axis 1" 2"', diam. 1''. The voice of this bird is a bark, like the short "yap" of a puppy. This is peculiar to the three species of the genus found on these islands, and at once betrays their presence; but they are far oftener heard than seen, being most difficult to distinguish amid the foliage. The iris is yellow buff, the naked space round the eye, the bill, and legs being in life of the most brilliant emerald green; this rapidly fades after death; tip of the bill yellowish. Like the others, it is capable of swallowing very large seeds, but it also feeds on a small purple berry; and its droppings stain a deep black, like ink, and equally indelible. On the Rewa it is called "Bora-bora-tana." On Ovalau

it goes by the name of "Buni-a-ko," or "Buniko." Mr. Storck, on the Rewa, tells me it is fond of the berries of Araliaceous trees, and creepers of the genus *Melastoma* (the purple berry, I suppose, I have named).

CHRYSÆNA VICTOR, Gould, P. Z. S. 1871, p. 642.

The "Orange Dove" of planters is found chiefly on Taviuni (especially on the north end), on the little island of Ngamia, at the island of Lauthala, and at Bua on Vanua Levu. The female and young male are dull green. I have an orange bird with many green feathers still remaining in it, shot at the end of November by Mr. Liardet on Taviuni, where it is called "Bulindamu" by the natives.

Mr. Kleinsmidt, a gentleman in Levuka much addicted to natural history, has preserved one of these birds alive for more than a year, feeding it on wild berries fetched daily from the forest. In uttering its bark it opens its lower mandible wide, and then closes it with a snap, jerking its head at the same moment. It is very fond of the sun, preening its feathers, and "shaking itself together." If kept in the shade it mopes, and sits with feathers all puffed out, and looking wretched.

Some Europeans declare they have had young birds unable to fly in the orange plumage; and they tell me the natives say they have taken them from the nest, male and female being thus coloured. I cannot credit this, and have offered £1 reward for a pair of nestlings in the orange garb. This alone will convince me; and I shall then come to the conclusion that this is an abnormal race that is being propagated, like the white race of *Procellaria gigantea* of the south-west coast of Africa.

CHRYSÆNA VIRIDIS, Layard, P. Z. S. 1875, p. 151.

This new Dove was discovered by the 'Challenger' expedition at Kandavu. I also obtained it there at the same time. Prof. Von Sohn wrongly identified it with *C. luteovirens* in the early, or green, stage of plumage. On my dissecting the specimen I obtained after their departure, I at once saw that the full breeding "στρογγή" was on, and that the Professor was mistaken, especially as he insisted on the identity of *C. victor* with it likewise. He assured me the German text of the 'Ornithologie' confirmed this; and that being a "sealed book" to me, I gave way. This bird, however, proves a permanent green form of *Chrysæna*; and for that reason I give it the name of "*viridis*." It is not uncommon in certain localities, but most difficult to see in the dense green foliage wherein it hides.

COLUMBA VITIENSIS, Quoy & Gaim. ; F. & H. *op. cit.* p. 137.

This large Pigeon is rather abundant on Ovalau and Kandavu, on the Rewa, and is, I fancy, very generally distributed. In common with the next two species it utters a hoarse barking note, which constantly reveals its whereabouts, and causes it to fall a prey to the fancier. Dr. Brower, the owner of Wakaia Island, opposite Levuka, and about 9 miles away, told me that on one occasion the three large

Pigeons were in such abundance that the captain of a merchantman and another, over there for a holiday, killed upwards of 100 between their landing one morning and departure next day on their return home. In common with the two next it is called "Rubé," or "Ruvé," by the natives. It lays two large white eggs, in December, axis 1" 7"', diam. 1" 2'".

CARPOPHAGA LATRANS, Peale; F. & H. *op. cit.* p. 140.

The "Barking Pigeon" of the settlers is generally distributed. To give some idea of the gastronomic powers of these large Pigeons, I annex the size of two seeds found in the crop of one, axis 4", circum. 3" 6"'; axis 5", circum. 3". This was only the hard woody part, the *pulp had been digested!*

This bird is called "Sonki," or "Songi," by some natives, especially about Taviuni. It has fourteen tail-feathers. Mr. Storek writes from the Rewa that it feeds largely on the wild nutmeg, the large drupe-like seeds of some Laurinaceous forest trees, and the fruits of both the *Kaufia Pakus*.

I have received eggs laid in April, pure shining white, axis 1" 10"', diam. 1" 3'". Some natives say they only lay one egg; but this I doubt.

CARPOPHAGA PACIFICA (Gmel.); F. & H. *op. cit.* p. 142.

This large Fruit-Pigeon is not nearly so common as the two preceding; but it frequents similar places, and cannot be distinguished from them by voice or appearance when at any distance. It breeds in December; and its eggs, sent me from Wakaia, are pure white.

PHLEGÆNAS STAIRI (G. R. Gray); F. & H. *op. cit.* p. 147.

This singular but beautiful Ground-Dove is found at Ovalau, Wakaia, and Taviuni, and probably elsewhere, though it has not come under my notice in other places. The wonderful purple-copper sheen of the back and wing-coverts of an adult male are most beautiful, and excite the admiration of all beholders. Unlike any other Pigeon of these islands, it seeks its food entirely on the ground. Here it runs as quickly as a Quail, springs to its wings on the least alarm, and glides through the underwood to a place of safety with the rapidity of lightning.

Mr. Kleinsmidt has kept it in captivity for a long period; but it is so timid that on the approach of any one to its large cage it instantly runs into a corner, and crouches down, just as a Quail or other game bird would do. The natives call it Ngilu (written in the missionary jargon "Qilu"). It breeds in low bushes, making a flimsy nest, never out of the reach of a man's hand, and lays two eggs, white; axis 1" 3"', diam. 10'".

RALLINA PÆCILOPTERA, Hartl.; F. & H. *op. cit.* p. 156.

Generally distributed; inhabits the thick Taro beds and swamps. It is very shy, and rarely seen, but is, I believe, easily trapped by the natives, who call it "Mbidi." It lays six eggs (in a nest made

of sedges), of raspberry-and-cream-coloured ground, speckled chiefly at the obtuse end with light purplish and dark dry blood-coloured spots; axis 1" 6"', diam. 1" 2"'. They nest in November and December, and, I think, also about March.

Bill rich salmon-colour; tips of both mandibles pale greyish. Legs and feet darker than the bill. Iris hair-brown.

RALLUS PECTORALIS, Less.; F. & H. *op. cit.* p. 157.

Found in the same situations as the former, but in greater numbers. This is also called "Mbidi" by the natives; in fact, I find that native names vary very much in different localities.

ORTYGOMETRA QUADRISTRIGATA (Horsf.); F. & H. *op. cit.* p. 164.
Non vidi.

ORTYGOMETRA TABUENSIS (Gmel.); F. & H. *op. cit.* p. 167.

This minute Water-Rail is found far in the interior, my specimen having been captured at Naruku-ruku, our furthest point on the Rewa river, on the edge of the cannibal-country. I also saw another in the rushes by the river-side as I floated down in a canoe; and Mr. Boyd sent me one caught on Ovalau, where it was called "Mo" by the natives.

PORPHYRIO VITIENSIS, Peale; F. & H. *op. cit.* p. 172.

The Blue Gallinule, or "Tiri" of the natives, is pretty common, and generally distributed wherever there is suitable dwelling for it. It devours small fish, crabs, insects, sugar-cane (in too much abundance to please the planter), and berries, perching on trees readily to procure the latter, and is esteemed very good eating in its turn. It lives well in confinement, but is a dangerous neighbour to any other pets in the aviary. A pair I gave Mr. Kleinsmidt being placed too near the cage of some young Parrots (*Platycercus personatus*), drew them one by one through the bars, and picked out their brains with evident relish.

LIMOSA UROPYGIALIS, Gould; F. & H. *op. cit.* p. 177.

The "Godwit" is found sparsely scattered over all our sea-board, which is singularly devoid of waders. We often rode or walked for a whole day along the shore without seeing any thing but a solitary Heron (*Ardea asha*).

ACTITIS INCANUS (Gmel.); F. & H. *op. cit.* p. 182.

This sombre-clad Sandpiper is found solitary, or in little knots of three or four, on the shore-reefs of most of our islands, but is nowhere common. It runs quickly about along the edge of the pools, probing with its long bill in quest of worms or small crustaceans, and turning about very rapidly. In some places it is very shy; in others it will allow of easy approach within 15 or 20 yards. I have seen it, off and on, at all times of the year. Bill greenish (livid), base of lower mandible pale yellow. Legs livid greenish; soles of feet yellowish. Iris brown.

CHARADRIUS FULVUS, Gmel.

I first met with the Golden Plover on the Lower Rewa, on a grass flat belonging to Mr. Page; here a flock of several hundred afforded some warm work to our guns, and an addition to our bill of fare. I subsequently found them all the way up the river, and on every other river we visited on Viti Levu; also on the coast at Loma Loma, Taviuni, and Vanua Levu. They are fond of sitting on the top of the stakes of the fish-kraals, waiting for the receding tide; off these I have often shot them. I saw them in full adult plumage, with black breasts, at Suva at the end of August.

STREPSILAS INTERPRES (Linn.); F. & H. *op. cit.* p. 197.

I saw one shot at Navua, on Viti Levu.

ARDEA JAVANICA, Horsf.; F. & H. *op. cit.* p. 207.

Not common. I shot it in young plumage at Kandavu in August. Breeds in the mangroves in October; the eggs are pale blue-green, axis 1" 9", diam. 1" 2".

ARDEA SACRA, Gmel.; F. & H. *op. cit.* p. 201.

Common all over the country among the mangroves.

DENDROCYGNA VAGANS, Eyton; F. & H. *op. cit.* p. 211.

The "Mountain-" or "Red" Duck of settlers is very local, and said by the planters at Naudi (on Viti Levu), where we saw it in some abundance, to come down from the mountains during the rainy season, December till March. I heard of it also as appearing from the mountains about the head-waters of the Waimanu.

ANAS SUPERCILIOSA, Gmel.; F. & H. *op. cit.* 213.

The "Black Duck," Ngaloa of the natives, is common on all our rivers, marshes, and even sea-board. According to its habitat, so are its edible properties; but it is at all times a welcome addition to the traveller's bill of fare.

STERNA BERGII, Licht.; F. & H. *op. cit.* p. 216.

This Tern is found on our coasts all the year round, but is nowhere common. As the coast-line is bare of waders, so are our seas bare of sea-fowl.

STERNA LONGIPENNIS, Nordm.; F. & H. *op. cit.* p. 220.

Non vidi.

STERNA MELANAUCHEN, Temm.; F. & H. *op. cit.* p. 224.

I think I saw this Tern at Navua, on the eastern coast of Viti Levu.

STERNA PANAYA, Gm.; F. & H. *op. cit.* p. 228.

Seen in small flocks out at sea in company with the next species. It rarely approaches the land; and only one specimen has been

secured, driven into Levuka by a hurricane which swept over the neighbouring sea.

Eggs have been brought me, said to be of this species, from the island of Wailangilala, to the N.E. of the group. They vary in size, shape, and coloration; a good average specimen is, axis 2", diam. 1" 5". Dull white, more or less speckled, but chiefly in the form of a ring at the obtuse end, with reddish brown and light purple spots.

ANOUS CINEREUS (Neb.); F. & H. *op. cit.* p. 239.

I fancy I have seen this species up to windward; and eggs have been brought from an island to the N.W., called Nuku Levu, of a bird the men on it call the "Snowy Petrel," said to be this species. Colour a pale cream, profusely dotted with dark red-brown and lighter purple spots; axis 1" 5", diam. 1", rather pointed at the small end.

ANOUS LEUCOCAPILLUS, Gould; F. & H. *op. cit.* p. 237.

Found in flocks on the open seas between the islands. During gales it approaches the land; and several have been brought to me picked up exhausted on the beach in Ovalau. One was seen by me, very tired and hardly able to fly, the day after the hurricane of January 7th, 1875; and one was brought in by Mr. Winchcomb on the 9th, picked up on shore, very thin and exhausted. Bill black; legs and webs dirty orange and black; iris brown; tongue yellow. Eggs, from Wailangilala, are like those of *S. panaya*, only smaller (axis 1" 9", diam. 1" 3"), and spots fewer and larger.

THALASSIDROMA MACGILLIVRAYI, G. R. Gray; F. & H. *op. cit.* p. 242.

PUFFINUS NUGAX (Solander); F. & H. *op. cit.* p. 242.

PROCELLARIA CÆRULEA, Gmel.; F. & H. *op. cit.* p. 246.

Neither of these three species has been seen by me during my residence here.

PHAETON ÆTHEREUS, Linn.; F. & H. *op. cit.* p. 250.

I have seen tails of *P. rubricauda* in the hair of the natives on the Windward Islands (Loma Loma); but they may have been brought from Tonga. I fancied, however, I saw a Phaeton at a distance, far out to sea, when we were on the north coast of Vanua Levu.

DYSPORUS SULA (Linn.); F. & H. *op. cit.* p. 260.

Seen about Mango and the Windward Islands. A young bird driven on shore at Levuka during the hurricane that swept over the Jasawas.

TACHYPETES AQUILA (Linn.); F. & H. *op. cit.* p. 265.

Seen about the Windward Islands in February and October. During gales it is invariably seen about Levuka; and during the hurricane which prevailed in the New Hebrides, and of which we felt the tail here in November last, the Frigate-birds sought the

shelter of the island. January 10th, 1875: During the hurricane that has just prevailed here, the Frigate-birds again came in.

Drs. Hartlaub and Finsch do not include this bird in the Fijian avifauna. It is, however, I find, a constant resident, though I cannot hear of its nesting.

9. Descriptions of some new Operculated Land-Shells from Southern India and Ceylon. By Lieut.-Col. BEDDOME.

[Received May 19, 1875.]

(Plates LII. & LIII.)

DIPLOMMATINA CANARICA, n. sp. (Plate LII. fig. 1.)

Shell dextral, broadly ovate, scarcely or very inconspicuously rimate, flesh-coloured; whorls $6\frac{1}{2}$, convex, all except the apical obtuse one closely, regularly, and sharply costulated; interstices smooth; spire conical; the fifth whorl much the largest, and projecting much more than the penultimate; the penultimate with the constriction just in front of the centre of the circular aperture; peristome shining, continuous round the penultimate whorl, slightly canaliculate in its free portion below; columellar margin much incurved; the tooth prominent, slightly deflexed: total length $\frac{1}{10}$ inch.

North Canara, in moist forests about Yellapore, 2500 feet elevation, 14° N. lat.

Allied to *D. carneola* (Stoliczka); but the columellar margin is very different, and it is a stouter shell.

DIPLOMMATINA GRACILIS, n. sp. (Plate LII. fig. 2.)

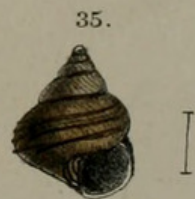
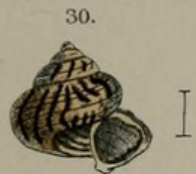
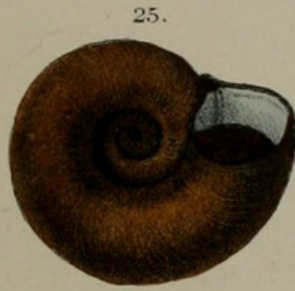
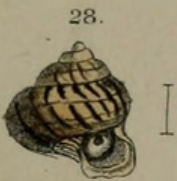
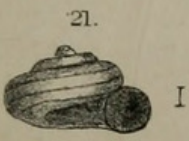
Shell dextral, narrowly ovate, straw-coloured, not rimate; whorls $6\frac{1}{2}$, all except the apical or 2 upper ones rather distantly and prominently costulated, interstices smooth; spire rather slender, the fifth whorl the largest and projecting a little more than the penultimate, the penultimate with the constriction over the centre or right centre of the aperture, aperture reniform; peristome continuous round the penultimate whorl, prominently angled, below the tooth double, the outer lip expanded and reflexed, columellar margin nearly straight, the tooth prominent, a little deflexed: total length $\frac{1}{8}$ inch.

Gudam hills, Vizagapatam, 3000 feet elevation, 17° N. lat.

DIPLOMMATINA MINIMA, n. sp. (Plate LII. figs. 3 and 4.)

Shell dextral, cylindrical, straw-coloured, not rimate; whorls $5\frac{1}{2}$, convex, all except the two upper ones minutely costulated, sutures deep; spire blunt and tapering very slightly, the antepenultimate whorl not larger than the penultimate, the latter very slightly constricted; the position of the operculum over the centre of the aperture, aperture circular; peristome shining, continuous round the





lower portion of the penultimate whorl, double in its lower free portion, the columellar margin semicircular, the tooth small but plainly visible under the lens: total length $\frac{1}{16}$ inch, $2\frac{1}{2}$ times the breadth.

Gudam hills, Vizagapatam, with the preceding, but very rare. This is the smallest known species of *Diplommatina* true; it is quite a connecting link between Semper's genus *Moussonia* (*Pupa problematica*, Mousson) and true *Diplommatina*.

These are the first species of *Eudiplommatina* discovered in Southern India; the genus does not apparently occur on our western ghats south of 14° N. lat., where its place is taken by *Nicida*. Large tracts of the mountainous country in the Vizagapatam and Ganjam districts are conchologically quite unexplored; and other species will no doubt be some day discovered, particularly as *Nicida* is not found. On the Nallay-Mallay mountains, Kurnool district, 15° N. lat., I could not detect either *Diplommatina* or *Nicida*, though *Opisthostoma* was discovered; these hills, however, have been only superficially searched, and *Diplommatinas* will I think yet be found there.

DIPLOMMATINA (NICIDA) ANAMALLAYANA, n. sp. (Plate LII. figs. 5 and 6.)

Shell scarcely rimate, oblong, the apex suddenly contracted, thin, whitish, shining; whorls 5, convex, the apical one small, obtuse, the second much larger, the three lower all equal in breadth (giving the shell a very oblong form), all smooth except the last, which has a very minute transverse striation, and is furnished with a basal keel; aperture circular; peristome double, externally expanded, and reflexed: total length $\frac{1}{14}$ inch.

Anamallays, in dense moist forests on the banks of the Peringoonda river, 2000 feet elevation, rare.

It is easily distinguished from all the other species by its very oblong form.

DIPLOMMATINA (NICIDA) SUBOVATA, n. sp. (Plate LII. fig. 7.)

Shell not rimate, conico-ovate, smooth, thin, shining, yellowish white, furnished with a subobsolete, very minute, oblique striation; whorls 6, convex, the penultimate the largest, the four upper ones gradually tapering, the apical one obtuse, the lowest whorl furnished with a rather prominent basal keel; aperture obliquely oblong; peristome single, not continuous round the penultimate whorl: total length $\frac{1}{11}$ inch.

South-Canara ghats, moist forests, 1000-3000 feet elevation.

Allied to *Nicida nitidula*, Blanf., but differing in its single peristome and more prominent basal keel.

DIPLOMMATINA (NICIDA) PEDRONIS, n. sp. (Plate LII. fig. 8.)

Shell subcylindrico-ovate, prominently rimate, thin, smooth, of a pale dull olive-colour; whorls 7, convex, the antepenultimate the largest, the four upper ones gradually decreasing, the seventh or

last whorl suddenly ascending and touching the antepenultimate, inconspicuously keeled at its base; aperture oblique, subcircular, white within; peristome continuous, single, black externally, slightly reflexed and expanded: total length $\frac{1}{7}$ inch.

Ceylon, near the summit of Pedrotalle Galle, the highest mountain in the island, rare.

DIPLOMMATINA (NICIDA) CEYLANICA, n. sp. (Plate LII. fig. 9.)

Shell not rimate, subcylindrico-ovate, thin, smooth, white, rather shining; whorls 7, convex, the antepenultimate the largest, the four upper ones gradually decreasing, the last whorl ascending slightly on the penultimate, keeled rather conspicuously at its base; aperture vertical, oblique; peristome continuous, single, scarcely expanded: total length $\frac{1}{10}$ inch.

Ceylon; on Pedrotalle Galle, about halfway up from Newera Ellya, abundant.

These two latter were the first species of this genus detected in Ceylon; and at the same time (1870) I found two other species about Rambaddi, at a much lower elevation—one the common Indian *N. liricincta*, and the other a species allied to my *N. anamallayana*, and which I refrain from describing here as I have since received it from Mr. Neville under the name of *N. chrysalidea* (Neville), and do not know whether he has already described it or intends doing so. That gentleman has also forwarded me a single specimen of a very slender distinct species under the name of *N. depauperata*; and more will, no doubt, be discovered in Ceylon and the western chain of ghats in the Madras Presidency.

OPISTHOSTOMA DECCANENSE, n. sp. (Plate LII. figs. 10 and 11.)

Shell irregularly rhomboidal, pale pink, with an oblique rather distant costulation, prominent on the lowest whorl, but less so on the others; whorls 5, excentric, the two apical ones very small and depressed, and only visible as a single small speck from a side view, the third much larger, convex, the fourth, or penultimate, convex, very large, and much dilated, lowest whorl constricted as usual and in front of the constriction deflected inwards, but not concealing the umbilicus; aperture reversed, circular, quite vertical and parallel with the penultimate whorl; peristome touching the centre of the penultimate whorl, double, both lips slightly dilated, with a broad channel between them: total length $\frac{1}{8}$ inch, breadth $\frac{1}{4}$ inch.

A smaller shell than *O. fairbanki* (Blanf.), and the costulation less prominent; the two apical whorls are much more depressed, the penultimate whorl is much larger, the deflection in front of the constriction is less sharp, and not, or only partially concealing the umbilicus; the peristome is more completely double, with a wide space between the two lips; and the aperture is quite circular.

Nallay-Mallay hills, Kurnool district, common on the Yerra Chalma, about 3000 feet elevation.

I have also a single specimen collected on the Sivagherry hills, Tinnevely district.

OPISTHOSTOMA DISTORTUM, n. sp.

Shell irregularly rhomboidal, pale-coloured, with an oblique rather distant costulation; whorls 4, excentric, the upper one very minute and depressed, not visible from a side view, so that the shell appears as with only three convex whorls, second whorl moderate, third or penultimate much larger than the second or fourth, lowest whorl constricted as usual, and in front of the constriction deflected upwards, but not concealing the umbilicus; aperture subangularly circular, pointing upwards, its apex in a line with the apex of the shell; peristome touching the upper part of the penultimate whorl, double, the lips not much dilated and with little space between them: total length $\frac{1}{28}$ inch, greatest breadth $\frac{1}{18}$ inch.

Golcondah hills, Vizagapatam, $17\frac{1}{2}^{\circ}$ N. lat., elevation 3000 feet, rare; by far the smallest species yet known. Only one specimen was found, and this is now with Mr. Blanford, or has been mislaid; and the description is from notes and a rough drawing made at the time it was collected.

CYATHOPOMA (JERDONIA) NITIDUM, n. sp. (Plate LII. fig. 12.)

Shell inconspicuously umbilicated, pyramidal, turreted, smooth, shining, of a yellowish olive tint, apex rather obtuse, sutures deep, a very minute oblique striation is generally visible under the lens; whorls 5, convex, smooth, the lowest scarcely descending towards the aperture; aperture circular; peristome continuous, single, thin; operculum double, thick, surrounded by a sulcate margin, externally very slightly concave; the nucleus very large, half the diameter of the circle, very thin, transparent, shining, destitute of whorls, the outer portion externally shelly, internally membranaceous, furnished with an exquisitely close spiral sculpture: length of shell varying from $\frac{1}{12}$ to $\frac{1}{8}$ inch, breadth of lowest whorl $\frac{1}{12}$ inch.

Anamallay mountains, 6000 feet elevation. South-Canara ghats, 4000 feet; a shell of very simple structure, closely allied to *Cyclostoma trochlea*, Bens. (*Jerdonia*, Blanford), but without any carinations, and a much smaller umbilicus; the operculum is very similar, but with a larger transparent nucleus and much more closely wound.

The operculum of *Cyathopoma wynadense*, *procerum*, and *kolamaliense*, is very similar to that of this shell, only differing in being a little more concave externally; so I propose that these species should be referred to *Jerdonia*, which, however, can, I think, only be kept up as a subgenus.

The operculum of *Mychopoma hirsutum* and *limbiferum* is quite that of *C. wynadense* and its allies, and only thicker in proportion to the size; there is the same transparent nucleus destitute of spiral whorls, and the same outer calcareous texture; and they must, I think, also be referred to the *Jerdonia* section of *Cyathopoma*.

The operculum of *filocinctum*, the type of *Cyathopoma* and its allies (i. e. *deccanense*, *kalryenense*, *malabaricum*, and *conoorense*), is at first sight very different; the margins of the outer shelly portion are much dilated and partially arched over, leaving a wide

gaping mouth, so that it is externally very concave; they have otherwise the same structure and the same diaphanous nucleus as in *Jerdonia*, and the two are only modifications of the same structure. Further on I describe three species of this section, in which the outer shelly portion is completely arched over, leaving only a small hole in the centre, so that the operculum is very convex, or papilliform, externally.

CYATHOPOMA (JERDONIA) BLANFORDI, n. sp. (Plate LII. fig. 13.)

Shell thin, umbilicated, pyramidal, turreted, straw-coloured, apex attenuated and subacute; whorls 6, sutures prominent, all the whorls, except the two small apical ones, prominently carinated; carinations two to three on the third whorl, three to five on the fourth, five to seven on the lowest, those about the umbilical region rather distant; umbilicus pervious; aperture circular; peristome thin, single, continuous, inconspicuously crenulate; operculum as in the last species: length $\frac{1}{7}$ inch, greatest diameter $\frac{1}{11}$ inch.

Tinnevely mountains, 4000 feet elevation.

I have a closely allied species from Ceylon, *Jerdonia dickoyensis* (Nevill, MS.); it is rather smaller, with a finer carination, and much smoother about the umbilical region; and I think specifically distinct.

CYATHOPOMA (JERDONIA) ALBUM, n. sp. (Plate LII. fig. 14.)

Shell widely umbilicated, depresso-turbinate, furnished with a chalky white or whitish brown epidermis, having a minute vertical striation, which is early deciduous, or only present in patches, the shell beneath being of a peculiar shining white horny texture; spire conoidal, apex subacute; whorls 4-5, spirally lirate, the lowest with four to five, the penultimate with three ribs or lines, more prominent before the loss of the epidermis; the umbilicus prominently spirally ribbed within; aperture circular, oblique; peristome thin, simple, continuous, slightly angled at the inner base at the termination of the first rib round the umbilical region; operculum externally very concave, with the margins of the outer shelly layer much raised but straight and not at all arched, multispiral, with a small transparent nucleus: length $\frac{1}{4}$ inch, breadth $\frac{1}{12}$ inch.

Yellagherry mountains, Salem district, 2500 feet elevation; Sirumallay hills, Dindigal, 3000 feet elevation; also, I believe, in Ceylon, as I have several poor specimens of what appears to be quite the same shell, collected at Dimbola, in the central provinces.

This shell is evidently allied to *Cyathopoma kalamalliense* (Blanford), which I have not seen; and I think that I should have considered it that species, only Mr. Blanford, who has seen my specimens, pronounced it distinct.

CYATHOPOMA (JERDONIA) ANAMALLAYANUM, n. sp. (Plate LII. fig. 15.)

Shell umbilicated, turbinate, with a conical apex, glabrous, with a

very inconspicuous vertical striation; epidermis yellowish, with broad, oblique, bright chestnut, vertical bands, white beneath the epidermis; whorls 6, convex, with deep sutures, and very faint spiral lines, generally visible on the two to three lower whorls under a powerful glass; the lowest whorl somewhat flattened below and keeled round the umbilical region, which is white and striated within, and less open than in *C. malabaricum*; aperture a little oblique, oblong; peristome, when adult, double, not dilated, continuous, before maturity simple, thin, and a little interrupted at the apex, where it touches the penultimate whorl; operculum a little retracted, a little concave externally from the slight elevation of the margin of the outer shelly portion, closely multispiral, with a moderate transparent nucleus: length $\frac{1}{7}$ inch, greatest diameter $\frac{1}{8}$ inch.

Anamallay hills, 6000 feet elevation, in the evergreen woods or sholas; Pulney hills, 6000 feet elevation, a rather smaller variety.

This is a glabrous species, with the same markings as *malabaricum*; it, however, is very much larger and more conical, not at all depressed, less prominently striated, has a differently shaped umbilicus and a different operculum: the spiral liration is very inconspicuous; and I did not detect it till I was very carefully comparing this with *ceylanicum*.

CYATHOPOMA (JERDONIA) OVATUM, n. sp. (Plate LII. fig. 16.)

Shell umbilicated, ovate, spirally lirate, furnished with a light, bright brownish, obliquely striated, thread-like epidermis, and a few hairs along the spiral costulations, white beneath the epidermis; spire conical, apex subacute; whorls 5, the lowest with about eleven spiral costulations continuous down to the umbilicus, the four upper lines nearest the suture less conspicuous, or subobsolete; the penultimate with three to four spiral lines, umbilicus moderately open, spirally lirate within; aperture oblique, oblong, the vertical and spiral lines clearly visible on the inside of the whorl; peristome continuous, or a little interrupted at the apex on the penultimate whorl, double, except on its inner or left margin; the outer lip expanded and reflexed on its outer margin, contracted at its base and again prominently expanded at the base of the columellar margin, the inner one white, shining, and minutely crenulated on its outer and lower margins; operculum as in *C. wynadense*, with a moderate transparent nucleus: length $\frac{1}{9}$ inch, greatest breadth $\frac{1}{13}$ inch.

Yellagherry hills, Salem district.

The epidermis and spiral costulations are very similar to those of *filocinctum* and *wynadense*; it is, however, a smaller species, and ovate, not turbate in form, and with a different operculum. *C. filocinctum* has the inner lip of the peristome furnished with large, prominent, obtuse, white crenations; and the spiral ribs or costulations on the base of the lowest whorl are always continuous up to the umbilical region, there being no intervening smooth space. *C. wynadense* has the inner lip of the peristome smooth; and the spiral costulations on the lowest whorl are generally interrupted by a smooth space

before the umbilical region is entered; but this latter character is not constant, as some of my specimens have the costulations continuous up to the umbilical region, as in *filocinctum*, so that it cannot, in the absence of the operculum, be looked to as a characteristic to distinguish them; but the peristome, where the shell is adult, is a safe character.

CYATHOPOMA (JERDONIA) SIVAGHERRIANUM, n. sp. (Plate LII. fig. 17.)

Shell pyramidal, turreted, thin, umbilicus very small and obscure, straw-coloured, glabrous, spirally lirate, apex attenuated, obtuse; whorls 5, convex, the two lower with five spiral lines scarcely raised, antepenultimate with 2-4 lines, aperture vertical, circular; peristome simple, thin, continuous or slightly interrupted at its apex; operculum double, with a sulcate margin, internally membranaceous, externally shelly, but only a little concave, as the margins are only slightly raised, nucleus central, transparent, moderate: length $\frac{1}{14}$ inch, greatest diameter $\frac{1}{17}$ inch.

Sivagherri mountains, 3000 feet elevation.

This comes nearest to *J. blanfordi*, but is very much smaller.

CYATHOPOMA (JERDONIA) ATROSETOSUM, n. sp. (Plate LII. figs. 18, 18 a.)

Shell umbilicated, ovate to subturbinated, spirally lirate, thin, semitransparent, whitish, furnished with a deciduous brownish vertically but inconspicuously striated epidermis, subobsolete, on some specimens; spire conical; whorls 5, rounded, furnished with numerous close, rather inconspicuous spiral lines, along which are numerous, rather distant, patent or suberect long black lines; umbilicus more or less open, with a more or less prominent keel at its entrance, inconspicuously ribbed or smooth within; aperture subvertical, circular; peristome single, subdouble or double, entire or with the outer margin beautifully crenated; operculum subdouble, externally white and shelly, and a little concave from the margins being raised, multispiral, with a large central transparent nucleus, internally membranaceous, convex, yellowish, shining: length $\frac{1}{10}$ inch, greatest diameter $\frac{1}{10}$ to $\frac{1}{14}$ inch.

South-Canara ghats, 3000 feet elevation; Anamallays, higher ranges.

The peristome, the umbilical region, and even the shape of the shell are very variable, both in the S. Canara and Anamallay specimens.

CYATHOPOMA (JERDONIA) ELATUM, n. sp. (Plate LII. fig. 19.)

Shell narrowly umbilicated, ovato-pyramidal, spirally lirate, epidermis brownish, furnished with distant prominent vertical striæ and a fine very minute striation also present between them; spire conical, apex subacute, sutures deep; whorls 5, rounded, furnished with numerous rather close spiral costulations, continuous down to the ribbed umbilical region; aperture vertical, circular; peristome double, the inner one continuous, quite entire or very inconspicuously crenate, outer more or less expanded and reflexed, continuous all round except at the left apex, where it comes into contact with the

base of the penultimate whorl; operculum as in *C. procerum* &c.: height $\frac{1}{8}$ inch, greatest breadth $\frac{1}{10}$ inch.

Golcondah hills, Vizagapatam district, 3000 feet elevation.

Very near *C. procerum*, but with rather a different epidermis and more ovate, having a broader base.

On the higher ranges of the Anamallays (6000 feet elevation) I collected three poor specimens of a species nearly allied to this and *C. procerum*, but without an umbilicus; it is probably quite distinct.

CYATHOPOMA (JERDONIA) VITREUM, n. sp. (Plate LIII. figs. 21 and 22.)

Shell openly umbilicate, depresso-turbinate, or rather subdiscoidal, the spire scarcely raised, whitish, of a shining glass-like texture, without any epidermis; whorls 4, the lowest terete, not descending angulari-convex, with three spiral prominently raised costulations round the region of the periphery, and one between them and the umbilical region, the upper portion nearest the suture non-lirate, or sometimes a fifth line is there present, penultimate angulari-convex, bilirate, the two apical whorls very small; umbilical region spirally lirate within; aperture a little oblique, subcircular; peristome single, thin; operculum double, with a very small central transparent nucleus, a little concave externally from the margins being slightly raised, outer layer less shelly than usual: greatest diameter $\frac{1}{14}$ inch, height $\frac{1}{22}$ inch.

Sivagherry mountains (Tinnevely district) 1000 feet elevation.

This comes nearest to *C. album*; but numerous specimens of all ages show no signs of any epidermis, and it is of a more depressed form, and of a glassy rather than a horny texture; the operculum is much less concave and scarcely shelly.

CYATHOPOMA (JERDONIA) SETICINCTUM, n. sp. (Plate LIII. figs. 23 and 24.)

Shell moderately umbilicate, turbinate, rather solid, spirally lirate, furnished with a brownish epidermis, which has a minute vertical striation, very hairy along the periphery, and slightly so about the sutures, but otherwise glabrous, white beneath the epidermis; spire conical (not convex or depressed, as in *C. hirsutum*); whorls 6, convex, sutures deep, the lowest terete, descending a little rather suddenly in front, with 12-15 continuous raised spiral costulations between the suture and the keel of the umbilical region, two of which at the region of the periphery are more raised than the others, and furnished with very long patent dark brown hairs, and between these two there are one or rarely two less prominent beardless costulations, penultimate with six to seven costulations, the upper and lower sutures slightly hairy, antepenultimate with five or six, and the whorl above it with two or three less prominent lines, the two apical whorls small and nearly smooth; umbilicus pervious, exhibiting all the whorls, not surrounded with a hairy fringe outside (as in *C. hirsutum*), spirally ribbed within, and there furnished with a strong raised thread-like sinuate or curved sculpture (more prominent than that in the same region of *C. hirsutum*); aperture oblique,

subcircular; peristome thick, double, the inner one pearly white inside and crenated (but less prominently than in *C. hirsutum*), outer one dilated on its outer and lower margins, particularly at its right apex and left base, and somewhat reflexed, more or less sinuate (but not with prominent crenations as seen in *C. hirsutum*); operculum double, externally concave, shelly, with a small transparent central nucleus: height $\frac{1}{4}$ inch, greatest diameter $\frac{5}{16}$ inch.

Anamallay mountains, moist woods on the banks of the Sholayar, a large river, 2000 feet elevation.

Nearly allied to *Mychopoma hirsutum*, but not furnished with the same curious, raised, thread-like epidermis, except within the umbilicus, and without any umbilical fringe; it is, besides, a smaller, differently shaped shell, and differs in other minor points, as indicated above. It has exactly the operculum of *M. hirsutum*, which, as before stated, does not differ from that of *Cyathopoma wynadense*; and some other forms that I refer to this *Jerdonia* section of *Cyathopoma* and *Mychopoma* cannot be kept up.

CYATHOPOMA (JERDONIA) CEYLANICUM, n. sp. (Plate LII. fig. 20.)

Shell prominently umbilicated, turbinate, with a conical blunt apex, inconspicuously spirally lirate, epidermis glabrous, yellowish, with obliquely vertical bright chestnut bands and a very inconspicuous vertical striation; whorls 5, convex or subangular, the lowest with two inconspicuous lines or ribs along the region of the periphery, and sometimes a third still more obsolete between them and the suture; penultimate with two carinations, the lower one almost touching the suture and sometimes obsolete, antepenultimate inconspicuously unicarinate; umbilicus somewhat angled at the entrance, smooth within; aperture nearly vertical, circular; peristome subdouble, continuous, inconspicuously angled or crenated at the exit of the two carinations of the lowest whorl; operculum as in *C. anamallayanum*: length $\frac{1}{9}$ inch, greatest diameter $\frac{1}{8}$ inch.

Ceylon, common in woods about the Rambaddi waterfalls.

Very like *C. anamallayanum*, but distinguished under the lens by its much more prominent though still inconspicuous carination; it is also of greater diameter with reference to its length.

CYATHOPOMA LATILABRE, n. sp. (Plate LIII. figs. 28 and 29.)

Shell deeply and prominently umbilicated, turbinato-globose, glabrous or subglabrous, epidermis of a pale yellowish brown colour, with oblique vertical dark chestnut-coloured bands and a minute vertical striation, white beneath the epidermis; spire conical, apex subacute; whorls five or six, the lowest smooth in its upper half near the suture, in the region of the periphery surrounded with three rather prominent carinations with a smooth space between them and the umbilical region, the penultimate and antipenultimate with generally two less prominent lines or ribs; lowest whorl cylindrical, slightly descending with an inconspicuous swelling followed by a slight contraction just in front of the reflexed peristome; the



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