

*cit.* p. 110), though it is perhaps hardly distinct from the Peruvian *P. unicolor*. But looking at the bill of *Spodiornis*, with its perfectly straight culmen and gonys, it would, I think, be impossible to place this little bird otherwise than in the neighbourhood of *Conirostrum*. There can be no doubt, however, to my mind, of the close connexion of the *Cærebidæ* with the *Tanagridæ*, and through them with the *Fringillidæ*.

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June 12, 1866.

Dr. J. E. Gray, F.R.S., V.P., in the Chair.

Mr. A. D. Bartlett made some observations on the singular bird of prey described by Mr. J. H. Gurney on the 14th of November, 1865, before the Society under the name *Stringonyx anderssoni*\*, and suggested its identity with the *Machaerhamphus alcinus* of Westerman, Bijdr. t. d. Dierk. i. p. 29. Mr. Westerman had given the locality of this bird as "Malacca," which had, no doubt, prevented Mr. Gurney from recognizing it in a specimen coming from Damaraland.

The following papers were read:—

1. Synopsis of the Birds of Ilha do Principe, with some Remarks on their Habits and Descriptions of New Species.  
By Dr. H. DOHRN, C.M.Z.S.

(Plate XXXIV.)

Two of the islands in the Bight of Benin have been pretty well explored by ornithologists. Mr. Fraser has given large accounts of the birds of Fernando Po; and during several years' stay in San Thomé, Mr. Weiss has collected a number of birds sufficient to show the peculiarities of the ornithological fauna of that island. During six months' stay in Ilha do Principe I have collected birds, and notes upon their habits, which, I hope, will not be without interest, the more because this island forms an intermediate link between the two above-mentioned localities.

It seems to me the most remarkable feature in the fauna of Ilha do Principe is that not a single bird of prey exists on the island, whilst they are abundant on the two other islands and on the nearest part of the continent. I saw hundreds of *Milvus parasitus* in San Thomé; *Gypohierax angolensis* and some other species are not uncommon in Fernando Po; but the whole tribe avoids Principe. The inhabitants

\* See P. Z. S. 1865, p. 618.





Smith lith.

M & N Hanhart imp

CUPHROPTERUS DOHRNI.





of the latter place and of San Thomé assert that there is a deadly hatred between the Grey Parrots (*Psittacus erythacus*) of Principe and the Kites of San Thomé, and that, if ever a *Milvus* visits the neighbouring island, hundreds of Parrots fall upon him and kill him, and that the Kites take revenge if perchance a Parrot should venture a trip to their kingdom. There must be some family reason for this strange degree of enmity, for they seem to live in tolerable peace together on the coast.

I observed and collected the following birds :—

1. CYPSELUS ABYSSINICUS, Licht.

Common in the neighbourhood of the town.

2. COTYLE EQUUS, Hartlaub, n. sp.\*

*Notæo toto cum alis et cauda fuscis; tectricibus caudæ superioribus pallidioribus: subtus alba, abdomine subflavescente; fascia pectorali lata dorso concolore; subalaribus albidis; rectrice extima pallida, apice late albo, macula pogonii interni brunnea notato; rostro nigricante, pedibus plumbeis; iride nigra.*

Long. circa 0·14, rostr. a fr. 0·09, alæ 0·12, caudæ 0·06, tars. 0·013 m.

Very rare; I saw only a few specimens near the sea-shore, and got one female for my collection.

3. HALCYON DRYAS, Hartlaub.

The manner of life of this bird reminded me of our Owls. I often observed them in the daytime sitting motionless on a branch, as if they were fast asleep, in dark shady localities. The small birds strongly dislike them; I suppose that sometimes their children are not refused by the *Halcyones* for a meal. As soon as they are discovered in their retreat, lots of *Nectarineæ*, *Zosteropes*, &c., are around them and amuse themselves with abusing them; finally the *Halcyon* leaves the place with a short shrieking outcry. If not annoyed, he has a soft melancholic tune, which sometimes appeared to me like soft and weeping cries of a child. They usually feed upon big insects; and I found often in their stomach pieces of snails, especially of *Columna flammea*.

They live in the woods, in the neighbourhood of small streams. Their name on the island is "Chocho."

4. ALCEDO CÆRULEOCEPHALA, Gmel.

Common on the shore; in a few instances I saw single specimens flying about in the interior of the island. The colour of the young bird is little different from that of old specimens; the bill is black, and the white spots on the throat and on the sides of the neck are very small.

This species is as lively as *H. dryas* is indolent. The native name is "Pica-peixe."

\* Dr. Hartlaub, our first authority for African birds, has had the kindness to send me descriptions of the new species which I collected.—H. D.



## 5. NECTARINIA HARTLAUBI, Verreaux.

Not uncommon; the male birds seem to occur more frequently than the females. The colouring of adult birds is known; young birds are very much like old females; by-and-by the yellow feathers of the throat and breast are changed into grey, and soon after begin to show blue metallic spots. Having observed these different stages of growth at the same time, I think that the time of hatching and breeding of these birds must be very irregular. According to the assertion of the natives they keep their nests during the whole year. I found great difficulty in getting a specimen; they build it in well-protected spots, hidden among bushes; it hangs down from a branch; and it is egg-shaped, with a small circular aperture on one side somewhat above the centre. It is 7-8 inches long, the diameter of the centre about 4 inches, of the aperture only  $1\frac{1}{2}$  inch. Its outside is woven of grass and pieces of dead leaves; inside it is well fitted with a thick and soft layer of cotton collected from different plants.

I doubt if this species has been found in Angola, mistakes in locality in these parts being very common; for cruisers and merchant vessels usually touch at several places of the coast and the adjacent islands, and, if special care be not taken, collections from different places are easily mixed up together.

## 6. NECTARINIA FRASERI, Jard.

This species lives in higher regions than *N. hartlaubi*, and frequents the branches of trees. The male bears a strong resemblance to the female of the former species, with the exception of the yellow axillary feathers, the greyish-brown legs, and the rather grey breast. Also the iris is less dark than in *N. hartlaubi*. The female is smaller, without the yellow feathers. I have not seen the nest, nor young birds, nor eggs.

The name for these two species in the island is "Beixa-flores."

## 7. CUPHOPTERUS DOHRNI, Hartl., nov. gen. et nov. sp. (Pl. XXXIV.)

Char. gen. *Rostrum mediocre, subrotundatum, carinatum, vix emarginatum, tomis pallidis, subpellucidis; culmine apicem versus arcuato, deflexo, gonyde ante apicem adscendente; vibrissis vix ullis. Alæ breves, caudæ basin parum superantes; remige primo spurio, quarto longissimo, quinto vix brevior. Cauda longiuscula. Pedes satis robusti; tarsus longiusculus, scutellatus; digitus externus et internus subæquales; ungues parvi, debiles.*

Char. spec. *Supra obsolete olivaceo-cinerascent, pileo magis cinerascente; uropygio subolivascens; alis et cauda dorso concoloribus, subalaribus et flexura alæ albis; remigum marginibus internis basin versus albis; gutture circumscripte albo; loris obscurius tinctis; abdomine albido-flavescente; hypochondriorum maculis nonnullis longitudinalibus fasciæque pectorali medialiter angustata cinerascentibus; rostro brunnescente, man-*



*dibula pallidior*; *pedibus brunnescentibus*; *iride obscure castanea*.

Long. 0·16–0·17, rostr. a fr. 0·013, alæ 0·071, caudæ 0·068, tars. 0·025 met.

No difference in the colour of the sexes.

These birds build their nests in the beginning of June, among bushes, about 4 to 8 feet high above the ground, like those of some of our *Sylvia*, about 0·1 in diameter and 0·07 met. deep. The female lays two eggs, dirty white, brown-spotted, 0·025 m. long, 0·016 m. large. Their song is like that of *Sylvia cinerea*, but louder and somewhat sharper; when quarrelling they make a noise like *Parus major*.

The native name is "Sibi fixe."

#### 8. PARINIA LEUCOPHÆA, Hartl.

No difference between male and female. The bill of the living bird is uniform dark grey; the feet are greyish brown; the iris sepia-coloured. The nest, composed of fine grasses and attached to two branches with the silk of moths, is comparatively small, no more than 0·09 m. in diameter and 0·06 m. deep. They hatch in June and July; the eggs are two in number, white, 0·019 m. long and 0·016 m. wide.

They live in small flocks in restricted localities.

#### 9. ZOSTEROPS FICEDULINA, Hartl., n. sp.

*Supra dilute olivaceo-virescens, uropygio et supracaudalibus flavioribus: subtus dilute flavida, subcaudalibus lætius flavis, loris pallide flavis; remigibus et rectricibus fuscis, dorsi colore fimbriatis; subalaribus albidis, flavido tinctis; pedibus pallide brunneis; rostro brunnescente, mandibula pallida; iride brunneo-flavescente.*

Long. 0·13, rostr. a fr. 0·09, alæ 0·052, caudæ 0·04, tars. 0·014 m.

Very different in colour from all congeneric species; its colour and voice bear some resemblance to *Phyllopneuste trochilus*. Lives in the hilly parts of the interior.

#### 10. DICRURUS MODESTUS, Hartl.

Young specimens are uniform black, without a white spot on the abdomen; the older they grow the more the tops of the feathers of the abdomen and breast are white-bordered. They build their nest in September, when the rainy season sets in. Its shape is like that of *Oriolus galbula*.

The native name is "Maria Palu, feiticeira" (translated, Maria Palu, the sorceress). The bird is black, with red eyes; seems very indolent in daytime, and shows a great ability in the imitation of some other birds' voices. Of course there must be some "feiticeira" in it: therefore, sitting on the roof of a house and singing in its melancholy manner, it prophecies the death of one of the inhabitants; and this, of course, takes place, but often a long time after this prophecy.



## 11. LAMPROCOLIUS IGNITUS, Nordm.

The female is about 2 or 3 inches smaller than the male, and a little less brilliant in colour. The metallic lustre in the plumage of the young bird begins at the tips of the feathers on the back, the breast and abdomen being greyish brown; the upper side being nearly finished, the feathers of the throat and the breast begin to change, but not in the same way as those of the back. These feathers change from the base up to the tip.

These birds live in high trees, and are very common in the high parts of the interior, where they are seldom disturbed. They are said to hatch in January and February, which I suppose to be true, judging from the development of young birds which I got.

## 12. LAMPROCOLIUS SPLENDIDUS, Vieill.

Very rare, in the same localities with the last species.

## 13. BUSERINUS RUFILATUS, Hartl., n. sp.

*Supra in fundo fulvo-rufescente, longitudinaliter fusco varius; capitis maculis minoribus; uropygio et supracaudalibus vix maculatis; remigibus et rectricibus fuscis, illis dorsi colore limbatis: subtus lætius fulvo-rufescens, pectore indistincte maculato; subalaribus et subcaudalibus concoloribus; pedibus et rostro brunnescentibus, mandibula pallidioribus; iride brunnea.*

*Fœm. vix diversa, minus nitide tincta.*

Long. 0.14, rostr. a fr. 0.014, alæ 0.08, caudæ 0.038, tars. 0.016 m.

I found a few specimens of this rare bird in a very restricted locality of the large western bay, living in bushy uncultivated places. The wings cover half the tail. They are very nice singers.

## 14. NIGRITA BICOLOR, Hartl.

Uncommon. The iris is red. My female specimens do not quite agree with Dr. Hartlaub's description, the throat, breast, and abdomen being slightly brown, and not whitish. I suppose that Dr. Hartlaub has been misled by a young specimen; at least one of those I collected, which begins to change its plumage, exhibits, besides chestnut-brown feathers on the breast, many which are greyish white.

## 15. SYMPLECTES PRINCEPS, Bonap.

Adult males are olivaceous on the back, with some darker spots; the head is brownish orange, less dark at the sides, with a yellow ring round the eyes; throat, breast, and abdomen light orange; the feathers of the wing blackish, bordered with yellow, those of the tail olivaceous, with a straight yellow border; the bill is black; the feet light brown.

Adult females differ in the olivaceous colour of the head and the yellow colour of the throat and breast; their abdomen is dirty white, and their bill of the colour of the feet. The iris of both sexes is yellow.



Young males are very much like the females; but as soon as the bill is full-grown it is much darker than that of the other sex, and from that moment they begin to change in plumage.

They are very zealous for the multiplication of their race; I observed them building nests and hatching in May and again in June, and I conclude from my specimens that they are also occupied with the propagation of their family in February. Their nest is always attached to the end of long and thin branches, or leaves of a palm tree. It forms a cone, 15 to 18 inches long and about 9 or 10 inches in diameter at the base; the small aperture is underneath, and just large enough for the old bird. It is very thick, and constructed of a flat kind of grass in such a manner that not a drop of rain can pass through the roof. The eggs are two in number, light blue.

16. *FOUDIA ERYTHROPS*, Hartl.

Swarms of from thirty to eighty specimens of this widely spread species are common. They usually live together with

17. *AMADINA CUCULLATA*, Swains.

This species hatches from May to July; builds a large nest between the branches of small trees, 6–8 inches in diameter and 5–6 inches deep; the eggs (four to seven in number) are white, very oblong, of the size of the eggs of *Sylvia trochiloides*.

18. *PSITTACUS ERYTHACUS*, L.

Exceedingly common; usually flying about in odd numbers, sometimes three or five together. When in town I observed them daily about half an hour before sunset crossing the northern part of the island in a southern direction; and early before sunrise they used to return to the northern district, I do not know for what purpose, large quantities of food as well as of trees, well fitted for sleeping-places, being in every part of the island.

19. *PSITTACULA PULLARIA*, L.

Said to occur on the island. I never observed it.

20. *CHRYSOCOCYX SMARAGDINEUS*, Swains.

These birds live during the dry season (from April to September) in the southern mountainous parts. They vary in size and in the colour of the tail. It seems to me that *C. intermedius*, Verr., is not different from this species.

Their name in San Thomé and Principe is "Sobo."

21. *TRERON CALVA*, Temm.

Very common all over the island. Hatches in September. The young bird exhibits no remarkable difference. The iris of this species is light blue.

22. *COLUMBA CHLOROPHÆA*, Hartl., n. sp.

*Supra obscure nigricanti-virescens, nitore viridi; nucha, collo*  
PROC. ZOOL. SOC.—1866, No. XXII.



*postico et interscapulio pulchre viridi-smaragdineo resplendentibus; sincipite dilute cinereo; cauda ardesiaco-nigricante; subtus unicolor cinerea; subcaudalibus ochraceo irroratis; collo antico nitore nonnullo virente; subalaribus ardesiacis; capitis lateribus cinereis; rostri dimidio basali nigricante, apicali flavido; pedibus carneis.*

Long. 0.30, rostr. a fr. 0.02, alæ 0.18, caudæ 0.10, tars. 0.02 m.

Very rare; I saw only a few specimens, the skins of which were with one exception spoiled by humidity and insects.

23. *PERISTERA PRINCIPALIS*, Hartl., n. sp.

*Supra brunnea, nitore cupreo-rubente et virescente; sincipite cano; nucha vinaceo-purpurascens; remigibus fuscis, 2<sup>o</sup>-5<sup>m</sup> valde emarginatis; subalaribus ardesiacis; mento niveo; pectore vinaceo-rubente; abdomine sensim albicante; subcaudalibus canis; colli lateribus late rubentibus; rectricibus, 2 mediis exceptis, nigris, apice late et dilute cinereis; rostro nigro, pedibus nitide rubris.*

Long. 0.26, rostr. a fr. 0.018, alæ 0.156, caudæ 0.08, tars. 0.03 m.

Uncommon; nearly allied to *P. simplex* from San Thomé.

24. *GLAREOLA NORDMANNI*, Fisch.

One specimen, not different from Russian specimens.

25. *ARDEA GULARIS*, Bosc.

Common on the rocks of the shore. Breeds in March and April. Young birds are not white, as Hartlaub asserts, but dark grey; their head is adorned with a crest of hairy feathers, which disappear in older specimens. Adult birds exhibit white feathers on their wings, varying sometimes on the right and left wings of the same bird, and show a tendency to grow white. I got one specimen, a very old one, nearly quite white; in some parts of the body the colour is somewhat greyish and dirty white, and some feathers are as dark as usual in this species.

26. *ARDEA ATRICAPILLA*, Afzel.

Less common than the preceding species; not different from coast specimens.

27. *GERONTICUS OLIVACEUS*, Dubus.

Soon after my arrival on the island I was informed by some natives that there was a very remarkable bird in the island called "Corvaõ." One told me that it was a kind of raven with splendid metallic wings; another described the bird "with the head of an owl and the feet of a duck, climbing up and down trees;" and others gave me other extravagant descriptions of it; but all of them agreed that the bird lived in almost inaccessible rocky and wooded localities of the southern district, and that if ever a specimen passed over the town it was a bad omen for the white inhabitants, who in such case were exposed to heavy disease or death. Of course I was very curious



to see this species, and settled for a fortnight in a negro's hut in those desert parts of the island. Whoever has visited those large tropical forests knows the difficulty of proceeding there. I enjoyed the special favour of heaven in arriving there when the rains set in a month before they usually do, and it was very hard work to run after these birds. I saw them daily at great distances, and heard them crowing like a Raven; but as soon as I entered the forests the monkeys made so much noise, barking and howling, as to alarm all the animals in the neighbourhood. Thus I was finally very glad when one of my native hunters appeared with a female specimen of the Corvaõ, which turned out to be *Geronticus olivaceus*.

My specimen is not different from those described by Dr. Hartlaub; the naked parts of the head are black; the feet are dirty yellowish; the long feathers of the head are not metallic; under the eye is a spot with very light-brown feathers; the iris is dark brown. The measurements are—Long. circa 0·60, rostr. a fr. 0·95, alæ 0·37, caudæ 0·17, tars. 0·07 m. They feed upon snakes, snails, and large worms and insects.

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|-------------------------------|---|
| 28. NUMENIUS ARQUATUS, Linn.  | } |
| 29. TOTANUS GLOTTIS, Linn.    |   |
| 30. ACTITIS HYPOLEUCUS, Linn. |   |
| 31. TRINGA SUBARQUATA, Gm.    |   |

These four species all live in the swamps in the neighbourhood of the town. They are not common; the last, killed in June or July, exhibits winter plumage.

32. STERNA MELANOPTERA, Swains.

Rare. I observed this species in Bahia d'Oeste, and never saw it in any other part of the island.

33. PHAËTHON ÆTHEREUS, L.

I saw this bird a few times flying about the coast of the island.

34. SULA FIBER, L.

Common on the west coast of the island, where some rocks are quite white with their excrement.

These are the birds which I observed during my stay (from April to September 1865) in the island. A typical collection of all my birds is in the possession of the Museum at Stettin. I have no doubt that there are a few more species, especially *Sylviadæ*, *Turdidæ*, and water birds; but I am sure that the following birds mentioned by Lopez de Lima and Erman do not occur in Prince's Island. These are—

- Neophron pileatus*, Burch. (Lopez de Lima.)  
*Nectarinia splendida*, Shaw. (Erman.)  
 — *senegalensis*, Linn. (Erman.)  
*Lamprotornis æneus*, Linn. (Erman.)  
*Pogonias vieillotii*, Leach. (Erman.)



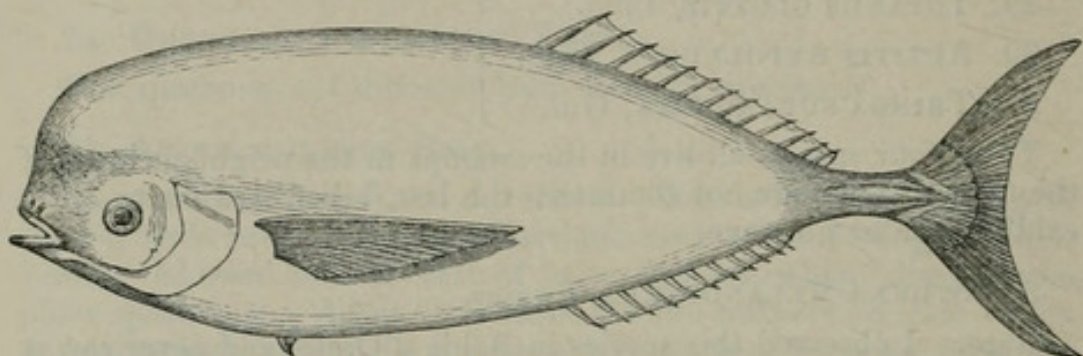
Lopez de Lima has written a book on the statistics of San Thomé and Principe, in which he gives a short account of the natural history of the two islands; but he never visited them. Erman received some skins of birds from Bissao and Principe from a Brazilian, and ran the risk of mentioning those from Bissao as having been collected in Principe, and *vice versâ*. Their notes are therefore without value.

2. On the Occurrence on the Coast of Cornwall of an Example of the Fish called Cuvier's *Ausonia* or Luvaru. By JONATHAN COUCH, F.L.S., C.M.Z.S., &c.

*Ausonia cuvieri*, Günther's Catalogue of Fishes in the British Museum, ii. p. 414.

*Luvarus imperialis*, Rafinesque, Caratteri di alcuni Nuovi Generi e Specie di Animali della Sicilia, p. 22.

*Proctostegus*, Nardo, Inaugural Dissertation in Prodrömus Observationum Ichthyologiæ, Patavii, 1827.



*Ausonia cuvieri*.

This fish is now for the first time known in the British islands; and it is of the rarest occurrence even in the districts where it has been met with, as may be seen from the scattered notices we have of it in the writings of the Italian naturalists above referred to, as also in the volume of Dr. Günther, where we find a description, communicated by the Rev. R. T. Lowe, of an example, supposed to be of the same species, obtained in Madeira.

The circumstances under which our example of this fish was met with in Cornwall appear to include a portion of its natural history, since something similar is related of one which formed the subject of Nardo's observations; and as our specimen has been added to the collection in the British Museum, after it had incurred considerable risk of being lost to science, it may be of some interest to relate a portion of the particulars, the more especially as they will account for the injury which it received at the time of its capture, and which would have been greater but for the skill bestowed on its preservation by Mr. William Laughrin, A.L.S.

On the last day of April in the present year (1866), whilst the



wind was strong from the east and waves rough, this fish was thrown on shore alive, on a small beach near the Dodmen, on the south coast of Cornwall; and besides some bruises which it then received, and wounds from the attack of a Gull, a further and more formidable danger was encountered from a fisherman who offered a price for it, that it might furnish bait for his crab-pots—an ignoble fate, from which the Sturgeon has not always escaped, and which I have reason to believe that other things of no small esteem to naturalists have not unfrequently suffered. It happened, however, in the present instance that a fisherman of greater intelligence was able, in my behalf, to offer a higher price; and I had the gratification of receiving this fish in a condition in which I was able to perceive that it had suffered nothing in its shape, its general condition, or colour.

The length of this example was, in a straight line to the fork of the tail, 3 feet 9 inches, which may be regarded as about the usual length of this fish, since, while the specimen described by Rafinesque is said to have measured 5 feet, that which is described by Nardo did not exceed  $2\frac{1}{2}$  feet, with a weight of 20 pounds, and that of Rafinesque 110 rotuli. Of our fish, the depth where greatest was 14 inches; the body and head much compressed, smooth, without the slightest appearance of scales; and where portions of the surface have been described as rough, as if sprinkled with bran, nothing like it appeared, except slightly on the underside near the tail; but the absence of this may have been produced by the rough usage it had received when thrown on shore by the waves. No mark of a lateral line; the gape restricted, but for its size the mouth capacious within; the jaws injured by violence, the lower a little protruded; mystache short and wide; teeth none, either in the jaws or palate. Eye large, round, low on the side of the head, in a line with the opening of the mouth; nostrils close to the front, near the upper jaw, and above them a falling in of the outline; a shallow depression running backward from it along the border of the gill-covers, and continuous with it a depression on the side, in which the pectoral fin may be received. Gill-covers smooth, firm, shutting close, the hindmost border elliptical, and not reaching to the root of the pectoral fin. Above the falling in of the front the outline rises steeply in a circular form, and is carried back in a moderately thin ridge to the dorsal fin, which is behind the middle of the body, and opposite the anal. The line of the belly is also firm and thin; the vent far forward from the anal fin and under the pectoral, where it is covered with a valve which moves on a hinge. Behind the dorsal and anal fins the body becomes narrow and broader; and on each side of this, near the root of the tail, is a prominent carination, and slightly beyond this a lower elevation on each side of it, resembling what is found on the tail of the Mackerel. The termination of the body is a little expanded, and at the insertion of the caudal fin slightly crenated. The dorsal and anal fins have each thirteen stout rays; the pectoral, whose origin is at a foot from the front, measures 10 inches in length, narrow towards the end, with twenty rays, of which the lower are short and slight; caudal fin forked, with twelve rays above and



below, and between these portions a pair widely apart and more fan-shaped.

Colour along the upper line of the head and body dark, with a cast of blue; all besides bright silvery; and I was informed that when first obtained, as the sun shone upon it, the brilliancy was such as to dazzle the eyes. Pectoral fins, caudal, and for the most part the anal brilliant red, the first ray with its membrane of the latter thicker than the others; the dorsal also a brilliant red, but the first three rays of this fin, with their membrane, firmer and redder than the others; the membrane between the other rays of this fin bordered with dark. The upper pharyngeal bones were numerous, hooked, slender, sharp, projecting, in, as usual, two pair of beds. Air-bladder large. Nothing in the stomach; but its inner surface studded over with projecting fleshy processes. I was not able to ascertain the weight of this fish; but while by the fisherman who obtained it it was judged to be about forty pounds, by others it was believed to be at the least double that weight.

In the account which Rafinesque gives of his example of this fish he makes the absence of a lateral line to be a character of the genus, with the vent situated under the pectoral fin, and having on its anterior border a valve to cover it. His specimen was obtained in the middle of June, in the year 1808, near Solanto, in Sicily; and in describing it he especially notices the absence of teeth and the limited extent of the mouth; the branchial rays four; rays of the dorsal and anal fins fourteen, of the pectoral twelve, in which probably he did not count such as were of small size, or they might have been lost. And he adds that it was called by the people "Luvaru Imperiale," from the resemblance of its colour in some particulars to that of the fish Luvaro, which is the local name of the *Sparus pagellus*; but whether this name was imposed on it at the moment or from long usage he does not say.

Dr. Gulia, in his enumeration of the fish of his native island Malta, says nothing of this species, except in a MS. note written in a copy of the work kindly presented to me by himself (*Tentamen Ichthyologiæ Melitensis*); but in another work (*Repertorio di Storia Naturale*, 1864) he mentions it on the authority of Professor Terafa, who appears to have seen even more than one example in that island.

But it is to Nardo, in his Inaugural Thesis, that we are indebted for a more extended account of this fish, as well of its external as of its internal structure, together with a figure, which, if not in the best style of art, is sufficiently exact to assure us of the form of the species. It appears, however, to have been drawn after the specimen had passed under the hands of the preserving artist; but in referring to his description I shall notice only those prominent particulars which throw some light on my own description and observations. It was in September 1826 that his example was caught, by some boys with their hands as it wandered among some rocks close to the shore in the harbour of Palestrina; and at the time when he wrote, it was preserved in a private museum at that



place. As it was entirely unknown (as far as he could learn) to all naturalists, he assigned to it the generic and specific name of *Proctotegus*, from Greek words which are expressive of the remarkable valve that covers and conceals the vent—a character which seems to be singular in this family of fishes. It was observed that this valve or covering was raised or let down by a voluntary action of the fish. The shape of the fish he compares in some degree to that of the *Coryphæna*, which is the Dolphin of sailors: the body without scales, but with some roughness on the surface; the mouth small and half circular, and without teeth; branchial rays three or four. He assigns to it, both in his description and figure, a lateral line, which became more distinct when the skin was dry; and he notices a rosy tinge on the lower surface of the body. The anal fin had fourteen rays, pectoral sixteen, and the vertebræ were counted as twenty. The inner surface of the stomach was studded with fleshy processes such as I have described; and in its cavity was found seaweed mingled with slime, a circumstance which explains the nature of its food. The substance of this fish is said to resemble beef, and to be of delicious flavour.

In Dr. Günther's 'Catalogue,' already referred to, there is a lengthened description of a species of this genus, which is supposed to be the same as that described by the Italian naturalists, and consequently as the Cornish example; but between the latter and that which had come under the observation of Mr. Lowe there are some important differences, which appear to point to a difference of species. Thus in the fish of Madeira, in front of the dorsal fin a separate spine was seated in a groove, into which it could be received, and there is also mention of a spine in front of the anal; but neither separate spine nor groove existed in our fish. Also, instead of a single and somewhat thickened cover, which, perhaps, in its ordinary condition lay flat on the vent (which portion of its body, from its apparent tenderness, seemed to require protection), in Mr. Lowe's fish this covering was double, being formed of "two short bony triangular prismatic spines, covering the vent like a pair of folding-doors." There were also "perfectly distinct" teeth in a single row in both jaws, and the hindmost rays of the dorsal fin were feebly branched.

Variation of colour is less to be regarded when occurring in fishes from different regions; but in this case the specimen is described as of a uniform iridescent pale steel or lead, reflecting rosy, lilac, or purple tints towards the back, silvery towards the belly and about the head; the dorsal and anal fins black in the membrane, with vermilion rays; pectoral fin 7 inches long, bright vermilion, as also the caudal; ventrals, as they are termed, flesh-coloured; the spine in front of the dorsal and anal fins whitish. The patches of the crust of the body were of a pale pink or dirty white tint; inside of the mouth purplish or dark mulberry-red. In none of these particulars did it resemble our fish.



3. Remarks on the Skeleton of *Ausonia cuvieri*.

By ALBERT GÜNTHER, M.A., M.D., Ph.D., F.Z.S.

Several years ago, when on a visit at Frankfort to examine typical specimens of the Senckenbergian Museum, my attention was directed to a skeleton of *Ausonia cuvieri*, perhaps the only osteological example of this fish existing in a Museum of Natural History, for which, as for most of its zoological treasures, Frankfort is indebted to the indefatigable zeal of Rüppell. Not only did Dr. Rüppell allow me to make notes from the specimen, but gave me, besides, a drawing of the skeleton, which is reproduced in the accompanying woodcut, and his notes on the splanchnology. The latter, however, do not contain anything not previously observed in Nardo's memoir "De Proctostego."

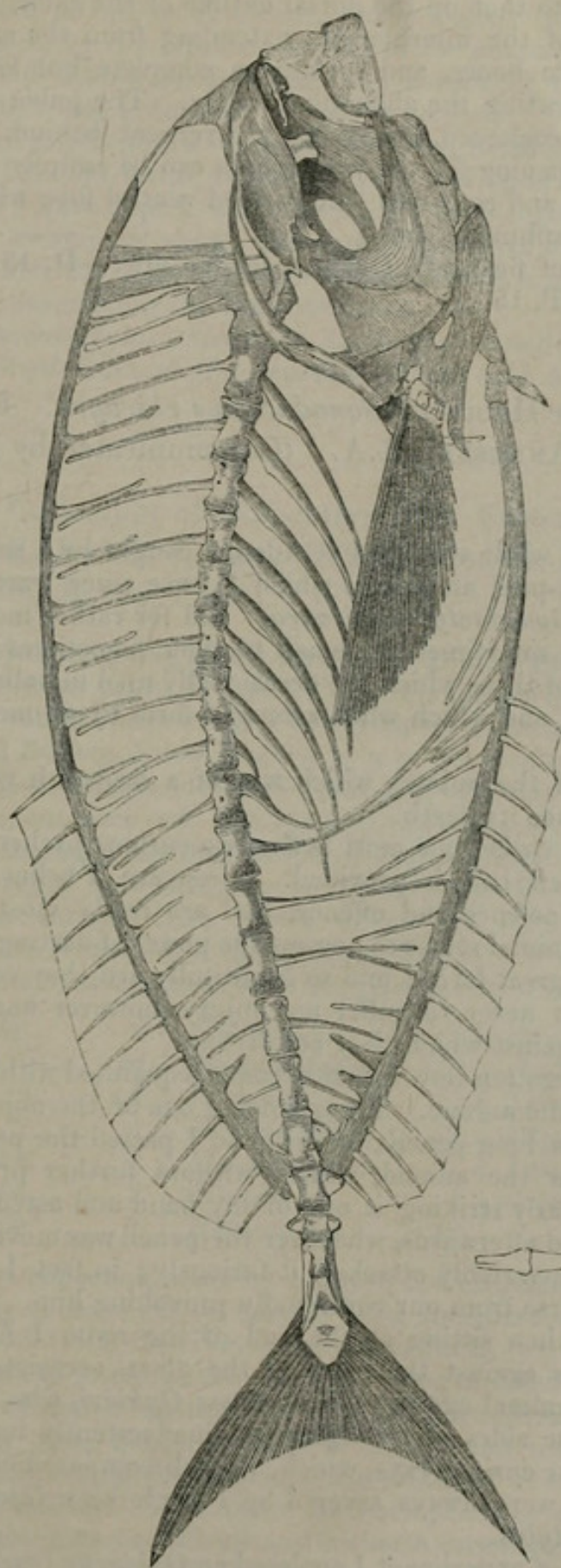
As I am not aware that any notice of the osteology of this unexpected visitor to the British seas has been published, I think it right not to pass by this occasion of appending my notes to the preceding paper of Mr. Couch.

I infer, from the feeble development of the whole osseous structure, and particularly from the relatively small quantity of inorganic substance, that *Ausonia* is a deep-sea fish, inhabiting not that deeper zone in which *Plagyodus* (Steller, = *Alepidosaurus*, Lowe) and other carnivorous fishes live, and where a vegetable-eater, such as *Ausonia* evidently is, could not subsist, but a zone at a depth of perhaps a hundred fathoms, perhaps in company with *Centrolophus* and *Pomatomus*\*.

The configuration of the bones of the skull will be seen from the accompanying figure. The prefrontal is elongate, straight, extending from the upper margin of the orbit to the extremity of the snout, where it terminates in a slight swelling which is the union with that of the other side. The fronto-parietal crest is subtriangular, and commences immediately behind that swelling; it is slightly thickened. Maxillary extremely feeble. Vertebrae 11/11. The first interneural spine is very strong, much longer and stronger than the others (which are thin and styliform), flat, sabre-shaped, and descends to above the occipital foramen, in front of the first neural spine, which is still stronger than the bone just described. The second neural spine has a broad basal portion which passes abruptly into the upper thin and styliform portion. One interneural generally corresponds to a neural. All the interneurals are so much dilated above that their upper extremities appear to be united by one semiossified ligament, which extends from the parietal crest to the end of the dorsal. The first rib is attached to the third vertebra, the tenth vertebra is without rib; all the ribs are anchylosed with the centra of the vertebrae, opposite to the base of the neural spines. The hæmal of the eleventh vertebra is extremely long and slender, arched forward, and passing into a semiossified ligament

\* Dr. Rüppell has also presented to the Senckenbergian Museum a skeleton of *Pomatomus telescopium*; it has 13/13 vertebrae.



Skeleton of *Ausonia cuvieri*.



which, similarly to that on the dorsal outline of the skeleton, unites the extremities of the interhæmals, extending from the end of the anal to the pubic bones, and forming a complete but feeble ring round and supporting the abdominal cavity. The pubic bones are very short and coalesced, but slightly divergent behind, so as to leave a narrow opening for the vent, which can be entirely closed by the rudimentary and coalesced but ossified ventral fins, which serve in this fish as a sphincter ani.

The formula of fin-rays of this specimen are:—D. 13. A. 14. C. 7 + 16 + 6. P. 15.

4. Notes on the Habits of *Gonodactylus chiragra*. By Lieut. O. F. T. ANNESLEY, R.A. (Communicated by Dr. J. E. GRAY.)

In May 1865, while stationed at Aden, I caught by a small hand-dredge in a rock-pool an animal which I have since learnt is most probably the "*Gonodactylus chiragra*," and for rather more than a month I kept it, sometimes in a small tumbler, sometimes in a large glass lamp, one of those which are occasionally used in halls, hanging from the ceiling, and which when arranged form by no means a bad aquarium.

The colour of the animal, which was of a brownish yellow, has greatly faded since its death.

Perhaps what strikes one most is the two curious prehensile claws with which the creature is provided. These are, I believe, used as instruments of defence and offence, and are really most powerful weapons. The animal seems to possess the power of darting them forward with very great force; and so beautifully are they constructed that they appear never to suffer any injury, however hard may be the substance against which they are driven.

I have not forgotten how I first became acquainted with the fierce propensities of the animal. I was moving one of the objects in the aquarium with a long pencil; in doing so I passed the pencil along the bottom near the animal, which, without further provocation, darted at it, nearly striking it out of my hand and astonishing me not a little. And afterwards, whenever the pencil was moved towards it, the animal invariably attacked it furiously; in fact I think his temper grew worse from our continually provoking him.

Frequently when sitting at the end of the room I have heard repeated knocks against the sides of the glass, occasioned by the attacks of this animal against the harmless *Ophiuri*, who, when travelling round the sides of the aquarium, inadvertently touched him with one of their curious rays, which, though composed of hard calcareous matter, were always severed by a single blow from the claw of the *Gonodactylus*.

For the sake of experiment I enclosed an *Ophiurus* (each of whose rays measured about 4 inches) and the animal in a tumbler, when the



former had no means of escape, and in a short time it was literally cut to pieces by the repeated attacks of the animal.

I do not believe he fed upon any portion of the *Ophiurus*, but merely destroyed it because it came in its way.

Though possessing a voracious appetite, feeding greedily on *Actiniæ* and similar forms, it can live very well upon animalcula in the water, as I have kept it without food for days together.

When swimming about, the fins or gills, five rows of which are placed under the belly of the creature, present a most beautiful appearance, resembling the finest feathers.

The *Gonodactylus chiragra*'s death was caused by the poisonous gases evolved from a *Holothurium* which died one night in the aquarium.

5. On a Collection of Coleoptera from Formosa, sent home by R. Swinhoe, Esq., H.B.M. Consul, Formosa. By H. W. BATES, F.Z.S.

Mr. Swinhoe having kindly forwarded to me a collection of Coleopterous Insects made by himself in different parts of the island of Formosa, with a request that I would report upon its contents to the Zoological Society, I now proceed to give the results of my examination. The collection, although consisting of a very large number of specimens, contains only 285 species; the materials therefore cannot afford us so ample an illustration of the Coleopterous Fauna of the island as could be wished, seeing that a region so varied in its physical conditions and lying partly within the tropics must nourish many thousand species of this order of insects. The following is an enumeration of the representatives of the different families;—

<i>Cicindelidæ</i> . . . .	8	<i>Histeridæ</i> . . . .	1	<i>Rhynchophora</i> . .	27
<i>Carabidæ</i> . . . .	18	<i>Lamellicornes</i> . .	47	<i>Anthribidæ</i> . . . .	3
<i>Dyticidæ</i> . . . . .	6	<i>Lucanidæ</i> . . . . .	7	<i>Longicornes</i> . . . .	34
<i>Gyrinidæ</i> . . . . .	1	<i>Serricornes</i> . . . .	16	<i>Phytophaga</i> . .	62
<i>Brachelytra</i> . . . .	1	<i>Malacodermes</i> . .	7	<i>Languriæ</i> . . . . .	1
<i>Dermestidæ</i> . . . .	2	<i>Cleridæ</i> . . . . .	4	<i>Coccinellidæ</i> . .	7
<i>Bostrichidæ</i> . . . .	1	<i>Heteromera</i> . . . .	32		

In a first collection made by a person not especially occupied with entomology there must necessarily be a considerable proportion of common and widely distributed species, as these, in tropical countries, are such as are found in the neighbourhood of dwellings and plantations, and therefore are the first to attract attention. This is so in the present case, about one-half of the species sent being already known as inhabiting the neighbouring continent or the islands of the Malay archipelago. The other half are probably new; but many of them belonging to difficult and hitherto unworked groups, cannot be at present satisfactorily decided upon. I do not find in the collection, what I had hoped for, any traces of great peculiarity in the



Formosan fauna as regards the Coleoptera. Of thirty-eight new species which I have to describe (excluding for the present the obscure groups as already mentioned), sixteen are closely allied to known Chinese specific forms, fourteen to species more widely distributed over Eastern Asia, two to Philippine Island forms, and six only are not very closely allied to any known species; these latter, however, are not strikingly peculiar, and have their nearest allies in Tropical Asian forms. The relations of the known species are not very different from those of the new ones. Thus, out of the sixty-nine known species which I have determined with the help of a few entomological friends who study special groups, no less than forty-seven are Chinese, twenty-six of wider distribution, or found in other parts of Tropical Asia, but not in China, and three Japanese or Japanese and Chinese. It must be borne in mind that we are at present very imperfectly acquainted with the insects of China; and consequently the relations of the two faunas may be still more intimate. In the letter which accompanied the collection, Mr. Swinhoe mentioned a species of *Damaster*, a highly peculiar Japanese generic form, as contained in the boxes. I have not succeeded in finding this insect in the collection, and am afraid it is lost, as the boxes were opened in transit. The discovery of a *Damaster* in the island of Formosa would have been the most interesting fact to record in a paper on the Coleoptera of the island.

The friends who have assisted me in the determination of the new species are Major F. J. S. Parry in the *Lucanidæ*, Mr. J. S. Baly in the *Phytophaga*, and Mr. Janson in the *Elateridæ*. All these gentlemen kindly allowed me to examine the type specimens of described Chinese and Asiatic species in their collections.

#### CICINDELIDÆ.

##### CICINDELA KALEEA.

*Gracilis, thorace angustato, subcylindrico, medio paulo latiore; capite thoraceque minutissime crebre punctatis, opacis, obscure cupreis; elytris nigris, opacis, leviter viridi-æneo tinctis, sparsim punctatis, macula parva humerali, tribus discoidalibus quarum duabus posterioribus interdum connexis, lineola marginali alteraque apicali virguliformi albis; capite inter oculos modice depresso, multistrigoso; labro testaceo (♂), medio producto et sinuato-truncato, dente parvo acuto; antennis modice elongatis; corpore subtus pedibusque elongatis, viridi-æneis.*

Long.  $4\frac{1}{2}$  lin., ♂.

A slender species, allied to the group to which *C. argentata* (Fab.) belongs, but of a more elongate form, with head more depressed between the eyes, and thorax more elongate and cylindrical. The colours are obscure, and the surface of the elytra very opaque. The labrum (in the male) is transverse, produced in the middle, with the front edge of the produced part sinuate truncate, and having a small tooth in the middle of the truncature; but the lateral angles of the truncature are not dentiform. The elytra have a sutural spine; their



surface is marked with a number of shallow scattered punctures, having a brassy greenish tinge. The white spots are sometimes more and sometimes less developed; the anterior discoidal spot is sometimes linear, and clavate at its posterior end; it is the hinder portion of what in other species is the humeral lunule; the lateral line is sometimes absent; the apical virgula narrows off, and does not reach the sutural angle.

#### CICINDELA PSILICA.

*Gracilis, thorace cylindrico, angusto; capite thoraceque tenuiter strigosis, aureo-cupreis, late cyaneo marginatis; elytris obscure cupreis, sutura viridi, lateribus cyaneo limbatis, æqualiter distincte punctatis, lunula humerali brevi, macula parva transversa laterali apud medium alterisque duabus apicalibus albis; capite inter oculos valde depresso, utrinque multistriato; labro utroque sexu testaceo, medio dente valido, margine anteriore recto, angulis lateralibus distinctis; antennis gracilibus, elongatis; elytris dente suturali acuto; subtus pedibusque elongatis viridi-æneis.*

Long.  $4\frac{1}{2}$  lin., ♂ ♀.

Closely allied to *C. craspedota*, Schaum, from Celebes, differing in being rather more elongated, with the elytra opaque instead of shining, and in having a humeral lunule and a spot at the sutural apex of the elytra. The thorax is elongate, narrow, and almost perfectly cylindrical. The head is strongly depressed between the eyes; the labrum has in both sexes a longish central tooth, and its front edge forms a straight line from the tooth to the lateral angles, which are distinct. The antennæ are long and slender; the palpi pale yellow, with the terminal joints brassy green. The head and thorax are of a rather bright coppery hue with a golden tinge, and with their sides broadly margined with greenish blue. The elytra are dull copper, and uniformly covered with largish and distant punctures; the suture is shining green, and the lateral borders dark greenish blue; the humeral lunule is short and slender, the marginal spot in the middle is broader than long, the subapical marginal spot is small and reniform.

#### COLLYRIS FORMOSANA.

*Cyanea, nitida, elytris viridi-cæruleis, capite et thorace læte violaceis, labro chalybeo; antennis subelongatis, articulis basilibus cyaneis, 3<sup>o</sup>-7<sup>m</sup> rufo-piceis (cætera desunt); capite pone oculos subquadrato, angulis rotundatis, fronte bisulcata, interstitio longitudinaliter elevato; thorace capite paulo longiore, prope apicem et basin modice strangulato, parte media rotundata; elytris æqualiter usque ad apices punctatis, apice (♀) flexuoso-truncatis, angulo suturali producto; femoribus anticis et intermediis rufis, geniculis cum tibiis et tarsis piceis; pedibus posticis nigris, femoribus basi rufis, trochanteribus omnibus rufis.*

Long. 7 lin., ♀.

Similar in shape to *C. filiformis*, Chaud. (Ann. Soc. Ent. Fr. 1864,



pl. 8. f. 9); head distinctly longer behind the eyes, but similar in outline; thorax rather more abruptly narrowed anteriorly, smooth and glossy violet (together with the head), and having very few punctures, with sides greyish hirsute. Elytra gradually widening from base to apex, clear dark blue, becoming greenish towards the suture, uniformly closely and distinctly punctured; apex transversely sinuate truncate, rounded exteriorly and sinuated near the suture; sutural angle forming a distinct tooth.

The other species of *Cicindelidæ* in the collection are—

*C. PUNCTATISSIMA*, Schaum.

Found also at Amoy.

*C. NIVEICINCTA*, Chevr.

A Hong Kong species.

*C. AURULENTA*, Fab.

A widely distributed species in South-eastern Asia.

*C. SEMIVITTATA*, Fab.

Also widely distributed, from India to Celebes and the Philippines.

*C. SEXPUNCTATA*, Fab.

Found also in India and the Philippines.

#### CARABIDÆ.

*CHLÆNIUS* (DIAPHEROPSOPHUS) SWINHOEI.

*Robustus, supra niger opacus, creberrime punctatus; elytris singulis paulo ante medium macula magna transversa fulva, striatis, striis vix distincte punctatis; antennis medio dilatatis, articulis tribus basalibus rufis; tibiis anticis et intermediis basi extus flavo-testaceis.*

Long.  $8\frac{1}{2}$  lin., ♂.

Robust, and with stout, moderately short legs. Head large, contracted behind, the eyes (which are prominent) closely punctured, slightly shining, black; labrum, palpi, and antennæ, except the three rufous basal joints, black. Thorax quadrate, with the sides regularly rounded and hind angles indistinct, as wide in the middle as the base of the elytra, very closely and coarsely punctured, dull black; longitudinal line distinct anteriorly; basal depressions elongated and shallow. The elytra are striated, and the striæ scarcely perceptibly punctured, except near the base. The fulvous spot of the elytra has its posterior edge in the middle of the elytra, and extends from the eighth to the third interstice inclusive, widest on the sixth, and very narrow on the third. Body beneath shining black, coarsely punctured on the sides; legs black, basal half of anterior and middle tibiæ on the outside flavescent.

This species differs from *C. (Diaph.) mellyi* (Chaudoir), an Indian



species, in the striæ of the elytra being scarcely punctured; the punctures are visible only with a lens, and chiefly near the base. The elytra are also more elongated than in *C. mellyi*. I do not know whether it may not be the *C. planicornis* (Laferté), also an Indian species; but the author has never published its characters.

#### LAMELLICORNES.

##### ANOMALA CORRUGATA.

*Oblongo-elongata, prope apicem paulo dilatata, supra viridi-ænea testaceo marginata, passim grosse creberrime confluentem punctata; clypeo marginibus elevatis, testaceo; thorace antice vix angustato, medio longitudinaliter impresso; elytris utrinque costis quatuor angustis lævibus; corpore subtus pedibusque rufo-testaceis; abdomine fusco-æneo; tarsis piceis.*

Long.  $6\frac{1}{2}$ – $7\frac{1}{2}$  lin.

An elongate species, widest close to the apex of the elytra; above fine light brassy green and shining, notwithstanding the coarse confluent punctuation with which the surface is covered, with the exception of the suture and ribs of the elytra. The borders of the clypeus, lateral margins of the thorax, and deflexed edges of the elytra are yellowish testaceous. The body beneath and legs are reddish testaceous, with the abdomen darker and brassy, and the tarsi pitchy.

##### ANOMALA INCONCINNA.

*Oblonga, postice dilatata, sordide rufo-testacea æneo tincta, capite thoraceque medio æneis; clypeo reflexo-marginato, grosse confluentem punctato, marginibus rufo-testaceis, vertice minus dense confluentem punctato; antennis piceo-rufis, clava (♀) parva; thorace crebre punctato, nitido, linea dorsali leviter impressa; scutello lateribus grosse punctatis; elytris oblongis (♀), striis 13 fortiter impressis, grosse punctatis, stria secunda a sutura latiore multipunctata, striis 5<sup>ta</sup> et 8<sup>va</sup> minus profunde impressis, interstitiis punctatis, colore sordide rufo-testaceis, æneo leviter micantibus; corpore subtus pedibusque passim punctatis, sordide rufo-testaceis, parce pilosis; abdomine æneo micante; unguiculis majoribus, anticis et intermediis apice fissis.*

Long. 6 lin., ♀.

##### EUCHLORA EXPANSA.

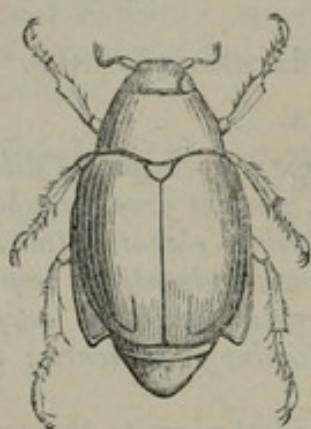
*Magna, ovata, convexa, supra viridis leviter aureo micans, minute punctata, glabra; infra viridi-ænea, lateribus tenuiter pubescens, pedibus violaceis, elytris utrinque margine postico in lobum foliaceum reflexum expansis. 12'''.*

Large, ovate, and convex; above green, with a slight golden tinge, finely punctulate, less densely so towards the suture of the elytra, and the longitudinal lines very faintly indicated. Beneath the colour is dark brassy green, glabrous, except a few hairs on the sides; legs



violet, tinged here and there with brassy. The hind margin of each elytron, before it curves to the apex, is expanded into a thin reflexed lobe, the underside of which is black.

Fig. 1.

*Euchlora expansa.*

#### EUCHLORA CASTANEOVENTRIS.

*Oblonga, supra viridis paulo micans, infra cum pedibus fusco-castaneis; capite subrugoso-punctato; thorace crebre punctulato; elytris grossius punctatis, hic illic plicatis, lineis longitudinalibus distinctis.*

Long. 8-9½ lin.

Distinguished from the allied species by the under surface of the body and legs being of a chestnut hue without any trace of metallic lustre, the tarsi and sometimes the tibiæ being darker. The shape of the body is more oblong than ovate; the pygidium is of the same green colour as the whole of the upper surface. The surface of the elytra is somewhat uneven, the punctures irregular and interrupted here and there with transverse wrinkles, the longitudinal lines of punctures and the ribs which they form are rather distinctly marked.

#### EUCHLORA TRACHYPYGA.

*Elliptica, vix convexa, viridis paulo nitens, crebre æqualiter sed haud grosse punctata; thorace antice valde angustato; elytris a medio distincte angustatis, margine membranaceo latissimo; pygidio magno, fere plano, obliquo, densissime subtiliter punctato-rugoso, opaco; segmento dorsali penultimo nigro; corpore subtus cupreo, pectoris et abdominis lateribus tomentosis; pedibus supra viridibus, infra cupreis.*

Long. 10½ lin.

Judging from the description, this species seems to be closely allied to *E. albopilosa* (Hope, Burm.), a Japanese insect; but this is represented as having distinct costæ on the elytra and a hairy pygidium: the remarkable form and sculpture of the pygidium, too, is not noticed. The general form is elliptical and flattened above; the elytra are narrowed from before the middle, and from this point commences the membranous border, which is very broad in this species.



## MIMELA SIMPLEX.

*Ovata, omnino æneo-olivaceo-viridis, nitidissima; clypeo creberrime, vertice cum thorace minus dense, elytris sparsim punctulatis; elytris interstitiis linearum punctorum lævibus, plicis nonnullis lateralibus; thorace lateribus trifoveolatis.*

Long.  $9\frac{1}{2}$  lin.

An ovate species, broader than *Mimela splendens*. The entire body and legs uniform olivaceous brassy green, brightly shining. The whole surface is minutely punctured; but the punctures are few and scattered on the elytra, and the spaces between the pairs of longitudinal lines of points are quite smooth; a few transverse wrinkles exist near the sides.

## MIMELA IGNICAUDA.

*Breviter ovata, supra viridi-ænea nitens, elytrorum marginibus præcipue apicalibus aureo-cupreis; clypeo maris angustissime, fæminæ late testaceo marginato, minute punctulato; thorace lateribus irregulariter late foveolatis, sulco utrinque basali profunde impresso, maris unicolori, fæminæ testaceo marginato; elytris grosse, parum profunde et subsparsim punctatis, interstitiis angustioribus lævibus, latioribus interdum transverse plicatis; corpore subtus obscure æneo-piceo; pedibus maris obscure æneis, femoribus testaceis, fæminæ pedibus testaceis æneo tinctis.*

Long.  $5-5\frac{1}{2}$  lin.

A small species, broadly ovate in the male, more elongate in the female, with the elytra, in both, dilated near the apex. The colour is dark brassy green, passing gradually into coppery on the sides of the elytra, and of a brilliant golden copper below the apical callus. The thorax is very minutely punctured; but the sides are occupied with a number of shallow irregular depressions, and there is a deep sulcus running obliquely near the hind margin on each side. The male has scarcely any trace of pale-testaceous margins; and, beneath, the femora are only sometimes of this colour; the female, however, has broadish pale margins to the clypeus and sides of thorax, and the under surface and legs are in large part of the same hue. The pygidium is brassy green and sparsely punctured.

## MIMELA CHRYSÆIS.

*M. splendenti colore similis, sed in utroque sexu oblongior, grossius punctata, oblonga, testacea; capite thoraceque viridi vel aureo-viridi micantibus, nitidissimis; elytris auratis; clypeo densissime rugoso-punctato; thorace grosse subsparsim punctato; elytris grossius punctatis, singulis sutura et costis (non dum elevatis) quatuor lævibus lineis punctorum marginatis; pygidio glabro, splendente, convexo, grosse distincte punctato, punctis rotundis; corpore subtus et pedibus testaceis, viridi-aureo micantibus, pectore lateribus coxisque posticis dense rugoso-punctatis, abdomine interdum cupreo.*

Long.  $7\frac{1}{2}-9$  lin.



Very similar in general colour and other characters to *M. splendens*, but much more oblong in figure and more coarsely punctured; the punctures of the elytra are large and distinct; the pygidium is convex and covered, but not closely, with large round punctures, its sides are distinctly sinuated, and its surface glabrous and brilliant. The male is relatively shorter and broader behind than the female.

I have compared this species with type specimens of *Mimela chinensis*, Kirby (= *splendens*, Sch.), in Major Parry's collection.

#### PECTINICORNIA.

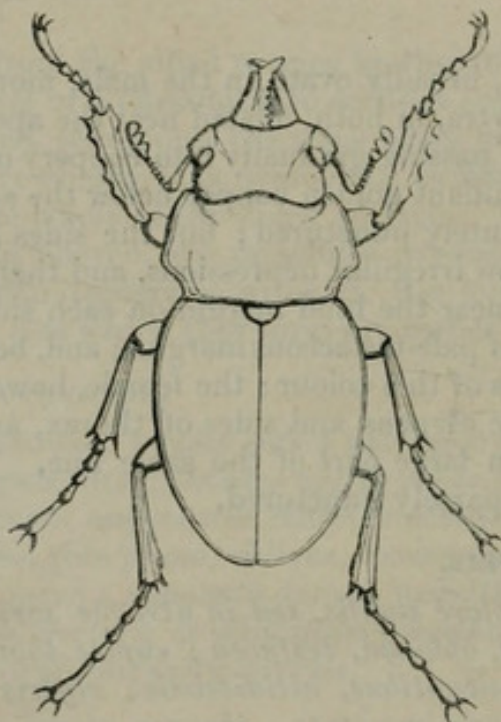
##### NEOLUCANUS SWINHOEI.

I am indebted to Major F. J. S. Parry for the following diagnosis and description of this fine insect:—

“*Latus, lævis, niger; mandibulis capitis longitudine arcuatis, interne irregulariter serratis, supra ante apicem dente parvo suberecto armatis; capite ad angulos anticos subquadrato; prothoracis angulis posticis subtruncatis; elytris castaneo-fulvis, basi extrema et scutello nigris; tibiis anticis latis, denticulatis, quatuor posticis inermibus.* ♂.

“Long. ♂ (mandib. excl.) 1" 4'''–1" 6'''.

Fig. 2.



*Neolucanus swinhoei.*

“Closely resembling *N. castanopterus* of Northern India; its general form, however, is somewhat broader, the elytra more elongated, of different convexity, and less rounded at their extremity. The prothorax is wider in proportion, more depressed; head broader, with subquadrate angles more produced, less polished; the form of



mandibles (in well-developed males) is totally different, the apical suberect tooth resembling that of other species found in China, such as *N. sinicus* and *N. championi*."

To this description I will add that the feebly developed males have scarcely any trace of the erect tooth, and therefore do not much differ from the same form in *N. castanopterus*; the side of the head before the eyes remains, however, always much more dilated laterally than in *N. castanopterus*. The convexity of the elytra culminates at one-third of their length, and then gradually slopes to the apex; in *N. castanopterus* the elytra are convex to about three-fourths of their length, and then dip rather abruptly to the apex.

The female resembles the male in colour and form; but the sides of the head are much more dilated exterior to the eyes, and angulated.

#### ÆGUS FORMOSÆ.

*Ego lævicolli simillimus, differt tantum (♂) elytris ad basin anguste et apud latera late crebre punctatis, interstitio tertio a margine etiam multo latiore.*

This apparently common Formosan species is so closely similar to *Æ. lævicollis* of China that it can scarcely be considered more than an insular modification of it. In the punctuation of the elytra it is almost identical with *Æ. capitatus* of Malacca and Borneo; but it differs much from that species in the shape of the thorax, position of the mandibular teeth, and in other points, in which it agrees exactly with *Æ. lævicollis*.

#### NIGIDIUS PARRYI.

*Oblongus, niger, nitidus; capite quam thorax paulo angustiore, lateribus ante oculos rotundato-dilatato haud angulato, fronte depressa sparsim minus grosse punctata; mandibulis (♂) porrectis, apice recurvatis, supra rugoso-punctatis absque dente erecto, intus obtuse dentatis; thorace angulis anticis obtusis, margine laterali antice incrassato, medio valde emarginato, angulis posticis late rotundatis, supra lævi, nitido, sulco dorsali abbreviato rugoso, plaga parva utrinque laterali punctata: elytris late punctato-sulcatis.*

Long. (mand. excl.)  $11\frac{1}{2}$  lin., mand.  $1\frac{1}{2}$  lin. ♂.

A more elongated insect than the other two continental Asiatic species (*N. cornutus* and *N. obesus*), and differing from all the allied species in entirely wanting the erect tooth or horn-shaped dorsal apophysis of the mandibles. The sides of the head are rounded before the eyes, and not produced into a point. The thorax has the lateral margin excavated in the middle. The sulci of the elytra are wide and deep, and have a chain of foveæ, but are destitute of the lines of fine punctures seen in *N. lævicollis*; the interstices are narrow, polished, and impunctate.

#### NIGIDIUS FORMOSANUS.

*Oblongo-elongatus, niger; capite ante oculos dilatato, angulis*



*acutis, supra lituris parvis curvatis impresso, lateribus rugosis; mandibulis brevibus, intus bidentatis, supra cornu suberecto curvato obtuso armatis, dense foveolatis; thorace lateribus medio emarginatis, supra passim punctato; elytris præsertim dorso minus profunde sulcatis, sulcis fundo serie punctorum ocellarium impressis, interstitiis punctulatis.*

Long. (mand. excl.) 6 lin., mand.  $\frac{1}{2}$  lin.

Much more slender and proportionally narrower than *N. lævicollis*; head very similar in shape, but the lateral dilatation not so much prolonged or retrocurved, the hind edge from the acute apex being transverse to the axis of the body; surface of the head covered with small semicircular impressions; mandibles thickly, coarsely, and deeply pitted; the dorsal apophysis is directed obliquely forward, curved inwards, and obtuse at the apex. The sulci of the elytra are wide and shallow towards the suture, the foveæ in their bottoms are ocellated and distinct one from the other; the sides of the interstices have a row of fine punctures.

The other species of *Lucanidæ* are:—

ODONTOLABIS CARINATUS, Linn.

A Silhet or North-east Indian insect.

CLADOGNATHUS INCLINATUS, Motschoulsky.

Hitherto known only from Japan.

EURYTRACHELUS PLATYMELUS, Saund.

A Chinese species.

#### SERRICORNES.

LACON FORMOSANUS.

*L. bipapulato simillimus quoad formam et colorem; thorace antice latiore magis rotundato, ante basin magis sinuato angulisque posticis productis quasi lobatis; corpore toto brunneo, tomento fulvo-brunneo plagiatis vestito; capite thoraceque grosse crebre punctatis; elytris grosse striato-punctatis, interstitiis crebre punctulatis.*

Long.  $8\frac{1}{2}$  lin.

Much resembling *L. bipapulatus* (Candèze, Monogr. Elatérid. Suppl. p. 11), a Chinese species, and differing almost solely in the form of the thorax, which is more rounded on the sides anteriorly, more sinuated towards the base, with the hind angles more produced; the latter form almost lobular projections, truncated at their apices.

LACON SETIGER.

*Elongatus, postice subabrupte attenuatus, corpore supra setis brevibus erectis brunneis dense vestito; capite grosse et profunde punctato, nigro, fulvo squamoso; antennis rufis, articulis quatuor basalibus piceo-nigris, articulis 2º et 3º subæqualibus*



quam 4<sup>tus</sup> multo minoribus: thorace elongato-quadrato, medio vix dilatato, angulis anticis et posticis late truncatis, supra convexo, profunde punctato, nigro, fulvo-griseo squamoso, maculis duabus rotundatis et vitta abbreviata longitudinali nudis; elytris a medio subabrupte angustatis, striato-punctatis, interstitiis punctulatis, rufo-castaneis, fulvo-griseo nebuloze squamatis; corpore subtus fuliginoso, rugoso, griseo squamato; pedibus piceis.

Long. 9 lin.

This species is remarkable in the genus to which it belongs for the setose clothing of the upper surface of the body. It is one of the most peculiar insects in the collection.

#### MELANOTUS UMBER.

*Modice elongatus, convexior, fuliginosus, subnitens, pube aureo-fulva subdecumbente minus dense vestitus; capite parvo, supra convexo, crebre punctato, nitido, carina frontali fortiter curvata; antennis piceo-rufis; pedibus pallide rufis; thorace valde convexo, dense nec grosse punctato, lateribus antice modice rotundatis; elytris minus nitidis, aspere punctulatis, fortiter punctato-striatis; corpore subtus concolori.*

Long. 7 lin.

#### MELANOTUS TAMSUYENSIS.

*Elongatus, depressus, piceo-fuliginosus, subnitens, pube grisea suberecta minus dense vestitus; capite supra grosse crebre punctato, carina frontali late rotundata, epistomate cum labro fuliginosis, palpis piceo-rufis; antennis omnino fusco-piceis; pedibus piceo-rufis; thorace lateribus subrectis, antice paulo angustato, supra vix convexo crebre punctato; elytris striato-punctatis, interstitiis punctulatis; corpore subtus piceo-fuliginoso.*

Long.  $7\frac{1}{2}$  lin.

#### SILENIS MUTABILIS.

*S. absimili vicina, colore variabilis, testacea cum thoracis disco nigricante, vel brunneo-testacea, vel obscure fusca thoracis angulis posticis solum obscure testaceis, vel denique tota nigro-fusca; pube grisea decumbente vestita, nihilominus nitida; capite thoraceque dense punctatis; elytris punctato-striatis, interstitiis punctulatis; pedibus rufo-testaceis; antennis piceis, articulis basalibus rufis.*

Long.  $2\frac{1}{2}$ –3 lin.

Much resembles *S. absimilis* (Cand. Mon. Elatér.), a Hong Kong species; differs in being more slender and very variable in colour. There are a dozen specimens in the collection, no two of which are alike in respect of colour. The pubescence is not very dense; and the surface is shining, especially the disk of the thorax, which is very glossy.



The following Chinese species of *Elateridae* are also contained in the collection :—

CAMPTOSTERNUS FULGENS, Fab.

AGRYPNUS POLITUS, Candèze.

AGONISCHIUS OBSCURIPES, Gyll.

All three found also in Cochin China, the Himalayas, &c.

HEMIOPS FLAVUS, Laporte.

Also Malay archipelago, Himalayas, &c.

MELANOXANTHUS MELANOCEPHALUS, Thunb.

Widely distributed over the tropical parts of the Old World.

#### LONGICORNES.

##### PHILUS PALLESCENS.

*Elongatus, subcylindricus, pallide fusco-cervinus, pube pallida subdecumbente vestitus; capite pone oculos elongatulo et leviter angustato, supra creberrime punctato; oculis magnis; tuberculis antenniferis incrassatis; antennis leviter serratis, rufo-cervinis, articulis 3<sup>to</sup>—11<sup>mo</sup> subæqualibus, maris corpore multo, fæminæ paulo, longioribus; thorace parvo, subrotundato, supra inæquali, crebre punctato; elytris subcylindricis, maris apice subacuminatis, supra minute crebre punctatis, carinulis indistinctis dorsalibus duabus; corpore subtus pedibusque obscure rufo-cervinis, articulo ultimo tarsorum tenui.*

Long. 8–9 lin., ♂ ♀.

Differs from the North China *Philus inconspicuus* (Saunders) by its paler colour, much less hirsute body, and longer and slenderer antennæ, especially in the female.

##### ERYTHRUS FORMOSANUS.

*E. championi simillimus, multo magis elongatus, scutello nigro; capite supra, antennis, corpore subtus (capite prothoraceque rufis exceptis) et pedibus nigris; thorace tuberculis duobus solum nigris; elytris elongatis, apice serratis, angulo suturali spiniformi, medio unicastis.*

Long. 9 lin.

Closely allied to *E. championi* (White, Cat. Long. Brit. Mus. p. 142, pl. 4. f. 4) of Hong Kong, but much more elongated, and the scutellum black instead of red. The face is clothed with reddish hairs.

##### PRAONETHA BINODOSA.

*Elliptica, convexa, cinerea, fusco varia; capite dense cinereo-cervino tomentoso; antennis corpore multo brevioribus, obscure fuscis, articulis basi cinereis, articulis 3<sup>o</sup> et 4<sup>o</sup> elongatis infra curvatis; thorace cylindrico, elytris multo angustioribus; dorso*



*paulo convexo, punctato, cinereo, lateribus late fuscis; elytris subtrigonis, convexis, apice truncatis, supra lineatim grosse punctatis, bicostatis, prope basin tuberculo magno compresso apice cristato, fusco et cinereo variis, prope apicem macula magna communi cinereo; corpore subtus pedibusque fusco et cinereo variegatis.*

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

The species which the present one most resembles in this extensive genus is *P. bigibbera* (Newman) of the Philippine Islands.

#### PRAONETHA KALEEA.

*Elongato-elliptica, modice convexa, fusca, elytris lateribus plaga magna et disco pone medium macula transversa cinereo-albis; capite tomento fulvo vestito, vertice late depresso; antennis corpore multo brevioribus, cinereo et fusco maculatis, articulo basali infra valde planato, tertio et quarto rectis; thorace parvo, quadrato, fusco-cinereo nebuloso; elytris oblongis, prope apicem angustatis, apice ad suturam breviter oblique truncatis, supra grosse et crebre sublineatim punctatis, bicostatis, tuberculo basali paulo elevato nigro; corpore subtus pedibusque fuscis, cinereo variegatis.*

Long. 3 lin.

#### ROPICA FORMOSANA.

*Elongato-elliptica, capite et thorace elytris angustioribus, cinereo-fulva, passim punctata; thorace lateribus paulo rotundato, fulvo bivittato; elytris oblique breviter truncatis, pone medium utrinque macula discoidali pallide cinerea.*

Long. 4 lin.

More elongate than the typical species, but of the same elliptical general outline; head and thorax of equal breadth and narrower than the elytra. Closely punctured; elytra more coarsely so, and clothed with dingy ashy-fulvous tomentum, with two clearer tawny stripes along the dorsal surface of the thorax, and a rounded discoidal ashy spot on each elytron, a little after the middle. The elytra are elongate-elliptical, and have the apical margins abruptly flattened out, with the apex obliquely truncated. Antennæ a little longer than the body; joints gradually diminishing in length from the fourth, and of a uniform ashy brown. Body beneath and legs dingy ashy. Claw-joint of the tarsi long and strong, with claws semidivergent.

#### SYBRA PUNCTATOSTRIATA.

*Elongata, sublinearis, depressa, capite thoraceque grossissime subdense punctatis, elytris punctato-striatis, stria suturali valde impressa; sordide cinereo-fusca, thorace fulvo indistincte quadrivittato; elytris lateribus fulvo strigatis, apice valde oblique subsinuato-truncatis.*

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

Belongs to the second section of the genus, as divided by Mr. Pascoe, in which the elytra have the apex "wedge-shaped, with the



sutural side concave." The body above is covered with very large punctures, which are irregular and rather close together on the head and thorax, and arranged in regular, slightly impressed rows on the elytra; the sutural row deeply sunk. The elytra are dingy ashy brown, with dull fulvous streaks along the interstices, and a few rounded scattered ashy spots. Body beneath, legs, and antennæ dull ashy brown.

#### SYBRA BACULINA.

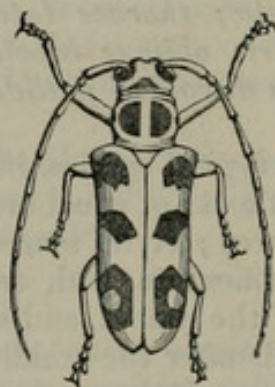
*Elongata, apicem versus attenuata, depressa, fusco-cinerea, vitta lata thoracis alteraque suturali elytrorum obscure fuscis; capite sparse punctato, fulvo-cinereo tomentoso, tuberculis antenniferis elevatis intus aculis; antennis fuscis, articulis basi cinereis; thorace subcylindrico, supra postice depresso, grosse crebre punctato; elytris apices versus attenuatis, apice breviter oblique truncatis, supra regulariter striato-punctatis, cinereo-fuscis, vitta lata suturali a basi usque pone medium obscure fusca; corpore subtus pedibusque sordide fusco-cinereis.*

Long.  $2\frac{3}{4}$  lin.

#### PARAGLENEA, nov. gen.

*A Glenea differt hoc genus novum elytris apice rotundatis, simplicibus. Typus Glenea fortunei, e China septentrionali.*

Fig. 3.



*Paraglenea swinhoei.*

#### PARAGLENEA SWINHOEI.

*Elongata, parallelogrammica, supra depressa, tomento læte viridicinereo vestita, maculis duabus thoracis, et tribus elytrorum, scilicet una transversa laterali subbasali, altera obliqua ante medium alteraque magna annuliformi ante apicem, nigris; corpore subtus pedibusque læte viridicinereis; antennis filiformibus, nigris, articulis basalibus viridicinereo maculatis.*

Long.  $6\frac{1}{2}$ –8 lin.

This species is very distinct from *P. fortunei* (Saund. Trans. Ent. Soc. 2nd ser. ii. pl. 4. f. 1), the only other as yet known of the genus, both in its form of body and markings, although there is a great general resemblance, and the colours are clear pale ashy green and



black in both. The antennæ in both sexes of *P. swinhoei* are longer than the body; the thorax is scarce perceptibly narrowed behind; and the elytra taper towards the apex extremely little in either sex; the spots on the disk of the thorax are large and nearly semicircular, being separated by a narrow line; the deflexed margins of the elytra have a black streak between the second and third black spots. There is a small black patch on the occiput; otherwise the head is wholly light green.

#### PHYTOPHAGA.

##### LEMA POSTREMA.

*Oblonga, ferrugineo-flava; antennis (articulo basali excepto), tibiis apice et tarsis nigris, elytris cæruleis; thorace medio valde angustato, sulco dorsali obsoleto, foveola prope marginem posticum impresso, supra sparse distincte punctato; elytris oblongis, pone scutellum transverse depressis, lateribus subplicatis, punctis validis in seriebus decem ordinatis, interstitiis lævibus; corpore subtus nudo.*

Long.  $3\frac{1}{2}$  lin.

##### LAMPROSOMA ALIENUM.

*Parvum, breviter ovatum, modice convexum, nigrum, nitidum, glabrum, supra regulariter haud profunde punctatum; occipite paulo convexo; fronte subplana, lævi, linea longitudinali impressa; antennis prothorace brevioribus, nigris, articulis duobus basalibus magnis, 3<sup>to</sup>–6<sup>um</sup> tenuibus, cæteris gradatim incrassatis; thorace ante scutellum producto acuto, scutello latiusculo triangulari; corpore subtus pedibusque nigris nitidis, prosterno medio angustato.*

Long.  $1\frac{1}{3}$  lin.

This is one of the most interesting insects in the collection, being the only Asiatic species at present known of a genus almost peculiar to America. The only exception to the purely American range of the genus hitherto made known was the European *L. concolor*. The present species is more nearly allied to the typical forms of *Lamprosoma* than that insect, having the median projection of the hind margin of the thorax more pronounced and pointed. The scutellum, however, is broader than in the *Lamprosomæ*, forming nearly an equilateral triangle, and plane on the surface. The antennæ are shorter than the prothorax, and gradually clavate from the sixth joint. The prosternum is formed as in the *Lamprosomata*, but is much narrower than is customary.

##### CHLAMYS FORMOSANA.

*Parva, breviter oblonga, castanea, corpore subtus nigro opaco; capite crebre grosse punctato, fulvo; antennis basi fulvis; thorace elevato, elevatione simplici, rotundata, utrinque a limbo postico-laterali distincte separata, crebre grosse punctato, disco antice lineis nonnullis brevibus elevatis, colore nigro, fulvo et rufo-castaneo variegato; scutello nigro; elytris grossissime punctato-rugulosis, costis transversis flexuosis irregularibus utrinque circa 8, colore rufo-*



*castaneis, partibus depressis obscurioribus, sutura nigra; corpore subtus nigro opaco, creberrime foveolato; abdomine castaneo maculato; pedibus rufo-castaneis; pygidio vage punctato, lineis elevatis longitudinalibus tribus.*

Long.  $1\frac{1}{2}$  lin.

#### CRYPTOCEPHALUS SWINHOEI.

*Breviter oblongus, niger, parum nitidus, subtus pilis brevibus argenteis subsparsim vestitus, antennarum articulis tribus basalibus, labro et palpis rufo-testaceis nitidis; capite punctis grossis sparsis, ad margines densioribus et in rugis confluentibus, medio fovea oblonga; thoracis marginibus antico et lateralibus stria profunda impressa, angulis posticis longe productis, dorso lævi, limbo laterali leviter punctato; elytris striato-punctatis, punctis postice subobsoletis, interstitiis planis lævibus.*

Long. 2 lin.

#### AORIA QUINQUEMACULATA.

*Subquadrata, convexa, castaneo-rufa, pilis cinereo-argenteis vestita; capite thoraceque grosse et dense punctatis, hoc medio macula magna nigra; elytris striato-punctatis, interstitiis (maculis posticis exceptis) punctatis, maculis quinque (scilicet una utrinque medio basis, altera communi medio suturali alteraque utrinque subdiscoidali pone medium) nigris; pedibus valde elongatis, rufis; antennis pallide rufis; pectore, lateribus, coxis posticis et maculis abdominis nigris.*

Long.  $2\frac{3}{4}$  lin.

Mr. Baly has received this species also from the north of China.

#### LINA FORMOSANA.

*Oblonga, postice vix dilatata, paulo convexa, læte viridi-ænea, antennis (articulis apicalibus fuscis exceptis) pedibusque flavis; capite medio late depresso, irregulariter subruguloso-punctato; thorace supra inæquali, irregulariter (lateribus grossius) punctato; elytris dense punctatis; corpore subtus æneo, nitido, lævissimo, abdominis margine testaceo.*

Long. 3 lin.

Allied to the European *L. ænea*; but distinguished by the yellow legs and base of antennæ.

#### HISPA CALLICANTHA.

*Oblonga, nigra, elytris chalybeo-nigris subnitidis; capite subtiliter ruguloso, opaco, medio canaliculato; antennis subclavatis, nigris opacis, articulo basali supra prope apicem spina longa flexuosa armato; thorace crebre fortiter ruguloso, medio sulco longitudinali brevi sublævi, postice transverse impresso, antice spinis duabus a basi furcatis, lateribus spina antica furcata alteraque posteriore simplici; elytris foveolis magnis seriatim ordinatis, marginibus spinis ocutis porrectis in serie regulari ordinatis, disco spinis*



*utrinque circa 25 a tuberculis orientibus ; corpore subtus pedibusque nigris opacis.*

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

#### ADORIUM CHRYSOMELOIDES.

*Ovatum, flavum, antennis pedibusque piceis, capite maculisque quatuor thoracis transverse ordinatis nigris ; elytris viridi-æneis nitidis, dense punctatis.*

Long. 4 lin.

Ovate, yellowish shining ; middle of breast and abdomen darker, reddish ; the abdomen with a row of black spots down each side ; femora and base of antennæ pitchy red ; the rest of the antennæ, tibiæ, and tarsi darker and blackish. Head shining black, with a very few punctures in a depression between the eyes. Thorax glossy and very faintly punctured, with four large black spots arranged in a row across the middle, and having a smaller spot behind between the two middle ones. Scutellum glossy, dark red. Elytra ovate, not much wider than the thorax at the base ; epipleuræ narrow and plane, thickly but not coarsely punctured, shining dark brassy green.

#### SEBÆTHE BALYI.

*Breviter ovata vel suborbicularis, testacea, glabra ; elytris macula supra callum humeralem, altera prope scutellum alteraque majore subapicali nigris (macula scutellari interdum majore et per suturam continuata, vel absente) ; antennis longitudine corporis, nigris, articulis duobus basalibus rufo-piceis ; capite sulco transversali inter oculos ; thorace impunctato, limbo laterali explanato ; margine reflexo, ad angulos anticos incrassato ; elytris subtilissime punctulatis.*

Long.  $2-2\frac{1}{2}$  lin.

The genus *Sebæthe* (subfam. *Halticinae*) was described by Mr. Baly in the 'Annals and Magazine of Natural History' for December 1864.

#### 6. List of Lepidopterous Insects collected at Takow, Formosa, by Mr. Robert Swinhoe. By ALFRED R. WALLACE, F.Z.S., and FREDERIC MOORE.

This small collection comprises forty-six species of diurnal, and ninety-three of nocturnal Lepidoptera, and bears internal evidence of having been chiefly formed in a cultivated district. It cannot, therefore, be taken as furnishing any adequate idea of the productions of the island of Formosa in this order of insects. The large majority of the species are those which are widely spread over the Eastern Tropics, and they generally present no striking differences from specimens collected in India or the Malay islands. There are not wanting indications, however, that a rich harvest of these beautiful insects could be obtained in the forests of the interior ; for the only two



species which occur in the collection belonging to the forest-haunting genera *Euplœa* and *Pontia* appear to be quite distinct from any yet described. There is also a *Pieris* which exhibits sufficient departure from the allied Indian and Malayan forms to deserve a separate specific name, and a small *Lycæna* which seems quite new. It is probable that at least four times as many species as are here given exist in Formosa; and it is to be hoped that Mr. Swinhoe may yet have an opportunity of continuing his researches. Some notes on the habits of the various species sent by that gentleman have been incorporated in the accompanying list; and the five new species of Butterflies which the collection contains have been described as a first instalment towards the insect-fauna of a new and most promising region. The new species are *Pontia niobe*, *Pieris formosana*, *Terias vagans*, *Euplœa swinhoei*, and *Lycæna nisa*. Mr. Frederic Moore, who has paid much attention to the nocturnal Lepidoptera (*Heterocera*), has furnished the list of that part of the collection, in which, however, it has not yet been possible to determine all the obscurer species.

#### Section RHOPALOCERA.

##### 1. PAPILIO DIPHILUS, Esper (*polydorus*, Bd.).

A common Butterfly in India, the Philippines, and the Malay islands. The Formosan specimens most nearly resemble the Indian form.

Mr. Swinhoe says, "Found near villages; I have not observed this species in China."

##### 2. PAPILIO ANDROGEUS, Cr.

The Formosan specimens of this very variable species are nearly the same as some from India and China.

"Very variable; two seldom seem alike. Some females have no tails."—*Swinhoe*.

##### 3. PAPILIO PAMMON, L.

"Found in gardens; not common."—*Swinhoe*.

##### 4. PAPILIO ERITHONIUS, Cr.

Agrees with Chinese specimens.

"Very common."—*Swinhoe*.

Mr. Swinhoe mentions seeing a tailed species like this, which he supposes to be *P. machaon*. It is more likely it would be *P. demolion*, Cr., or perhaps a new species altogether.

##### 5. PIERIS FORMOSANA, n. s.

*Male*. Above, exactly as in *P. hippo*, Cr. (*eleonora*, Bd.). Beneath, the apical spot on the upper wings is larger; the disk of the lower wings is white washed with yellow, which is deepest at the base and outer angle; and the marginal dusky band is narrower.

*Female*. Above, like *P. hippo*, Cr., but the hinder wings dusky,



with diffused whitish stripes, and powdery yellowish marks between the nervures along the hinder margin. Beneath, differs from *P. hippo* in the under wings being white, with dusky nervures and band on outer margin, and a yellow edging at the base and the outer angle.

This is a local modification of the Indian *P. hippo*.

Expanse  $2\frac{1}{2}$ – $2\frac{3}{4}$  inches.

*Hab.* Formosa.

"Frequents banyan trees."—*Swinhoe*.

6. *PONTIA NIOBE*, n. s.

Form and size of *P. nina*. Wings whiter; the apical patch entirely absent; the discoidal spot very small, as in some specimens of *P. nina*. Beneath paler and less irrorated, and the transverse posterior band interrupted and less distinct than in the allied species. Extreme tip of the antennæ orange.

Expanse  $1\frac{5}{8}$  inch.

*Hab.* Formosa.

"Found in the dark shade of groves and lanes. Flies low, with a slow dodging flight."—*Swinhoe*.

7. *CALLIDRYAS PYRANTHE*, L.

"Abundant among rank overgrown herbage."—*Swinhoe*.

There is one specimen of a very small form of this species ( $1\frac{3}{4}$  inch expanse), which Mr. Swinhoe seems to consider distinct. It is, however, identical in form and marking with the larger specimens.

8. *CALLIDRYAS ALCMEONE*, Cramer.

"Scarcer than the last, wilder flight."—*Swinhoe*.

9. *TERIAS HECABE*, L.

"Common among grass."—*Swinhoe*.

A variety occurs much smaller than usual, and in which the black margin of the upper wings is hardly sinuated, indicating a transition to *T. drona*, Horsf.

10. *TERIAS VAGANS*, n. s.

Wings with the anterior angle nearly square, but slightly rounded; hind wings subangular. *Male*: pure yellow, with a black border on the uppers, nearly as in *T. læta*, stopping abruptly before reaching the outer angle; hind wings with a very faint mark at the outer angle; beneath yellow, with an indistinct dusky transverse band across the middle of the hind wings. *Female*: pale yellow, faintly powdered with dusky scales; dark border as in the male; a very minute dark mark at the end of the discoidal cell of the uppers, a dusky patch at the outer angle of the lower wings, and the ends of the nervures between it and the anal angle each with a transverse black mark; beneath nearly as above in colour, but without markings, except the mark at the end of the cell of the uppers, a black



dot near the base between the costal and subcostal nervures of the hind wings, and a very minute black dot at the end of each nervure on the hind margin.

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

*Hab.* Formosa; North India.

A single female specimen of this insect was sent from Formosa, and one male exists in the British Museum Collection from India, showing it to be a very distinct species, which is probably widely distributed, but rare and local. It comes very near *T. venata*, Moore, from Northern India.

11. *DANAIS PLEXIPPUS*, Godart.

“Scarce in Formosa.”—*Swinhoe*.

12. *DANAIS CHRYSIPPUS*, Linnæus.

Mr. Swinhoe notices the resemblance of this species in appearance and habits to the female of *Diadema bolina*, L.

13. *EUPLÆA SWINHOEI*, n. s.

Above—brown black, velvety, with a dark purple gloss; hind wings near the anterior margin and anal angle browner; upper wings with a submarginal row of six white oval spots edged with blue, the second from the top largest and nearly touching the first; two dead-black stripes parallel to the lower margin. Hind wings with the anterior margin ashy white; a row of eight small round white spots close to the hinder margin, not reaching the anal or outer angles, and a submarginal row of four blue-edged spots, the largest near the outer angle. Beneath—deep brown; upper wings with three spots on the disk, the two upper ones blue (the smallest in the cell), the lowest larger and ashy white; a marginal row of eight small round white spots beginning at the outer angle, and within it a row of five spots, commencing opposite the space between the third and fourth of the marginal row; the four first very small; the last elongate, situated below the apex. Hind wings with the marginal row as above, but of nine or eleven spots; the submarginal row of three small white spots, and four small bluish spots arranged in a curve outside the extremity of the cell. Wings all finely white-edged between the nervures. The body beneath is white-spotted, and there are five white spots on the base of the wings, close to it, on each side. Abdomen blue black, with a group of bluish-white scales at the base of each segment.

Expanse  $3\frac{1}{4}$  inches.

*Hab.* Formosa.

A single specimen was taken by Mr. Swinhoe at the foot of a hill a few miles inland. It most resembles a new species from Celebes, near *E. doleschalii*, Felder.

14. *MESSARIS ERYMANTHUS*, Drury.

“A solitary species: frequents flowers.”—*Swinhoe*.



## 15. JUNONIA LEMONIAS, Linnæus.

This agrees in markings with Indian specimens, but in form makes an approach to the Malayan species, *J. aonis*, L.

"Common in grassy places and hedgerows."—*Swinhoe*.

## 16. JUNONIA ORYTHIA, L.

This more resembles the Malayan than the Indian form of the species.

"Common where stones abound and the grass is short."—*Swinhoe*.

## 17. JUNONIA ASTERIA, Linnæus.

"Most abundant in rank and marshy places."—*Swinhoe*.

## 18. DIADEMA AUGE, Cramer.

"Suns itself about hedges, and has a stately sailing flight."—*Swinhoe*.

## 19. DIADEMA BOLINA, Linnæus.

"The male is a very lively creature, basking on plants and stones, flitting about and taking long excursions, and fighting with all Butterflies that come near its beat. The female appears to be much scarcer, or rather perhaps shows herself less. In habit she is quite distinct, lazing all day about bushes, and seldom flying far. When a female is observed, several males rush at her at once. Before I learnt the sexes I was sorely scandalized to see a blue-black and a red *in copulâ*. I thought I had discovered a libertine among Butterflies. But I have seen the thing so frequently now that I am convinced the two are merely sexes of the same species. I have never observed the males on flowers, though I have seen some hundreds."—*Swinhoe*.

## 20. HESTINA ASSIMILIS, Cramer.

"Not uncommon, but very local and difficult to capture."—*Swinhoe*.

A Chinese species.

## 21. NEPTIS ACERIS, Esper.

A widely distributed species.

"Common about tall grass and sides of grass-grown streams."—*Swinhoe*.

## 22. ATHYMA LEUCOTHÖE, Linnæus.

"Common on bushes and grassy places, fluttering and sailing through the air. Suck the sap of wounded trees. Males fight for the females."—*Swinhoe*.

## 23. MELANITIS UNDULARIS, Fabricius.

"Loves shaded lanes, sluggish and never flies far."—*Swinhoe*.



24. *ERGOLIS CORYTA*, Cramer.

"Frequents hedgerows and places overgrown with rank herbage. Has a slow floating flight."—*Swinhoe*.

25. *CYLLO LEDA*, Linnæus.

"Common; frequents trunks of trees and the ground in dark shady places."—*Swinhoe*.

26. *DEBIS EUROPA*, Fabricius.

"Loves to cluster on bamboo joints."—*Swinhoe*.

27. *MYCALESIS DRUSIA*, Cr. (? *mineus*, L.).

28. *MYCALESIS SAMBA*, Moore, Cat. Mus. E. I. C. p. 233 (*lassis*, Hew.).

29. *MYCALESIS OTREA*, Cramer.

This differs from Cramer's figure in having a whitish band on the underside; but these insects vary so much that it would not be safe to describe it as distinct. Mr. Swinhoe says the species of *Mycalesis* are common about grassy places in Formosa.

30. *LYCÆNA ELPIS*, Godart.

One specimen only of this species was sent by Mr. Swinhoe.

31. *LYCÆNA CNEJUS*, Fabricius.32. *LYCÆNA KANDARPA*, Horsfield.33. *LYCÆNA PLUTO*, Fabricius.

"Rather plentiful; very desultory and dodging in flight."—*Swinhoe*.

34. *LYCÆNA PLINIUS*, Fabricius.

"About long grass."—*Swinhoe*.

35. *LYCÆNA PARRHASIUS*, Fabricius.

36. *LYCÆNA VARUNANA*, Moore, Proc. Zool. Soc. 1865, p. 772, pl. xli. f.  $\beta$ . 6

37. *LYCÆNA SANGRA*, Moore, Proc. Zool. Soc. 1865, p. 772, pl. xli. f.  $\phi$ . 8

38. *LYCÆNA KARSANDRA*, Moore, Proc. Zool. Soc. 1865, p. 505, pl. xxxi. f. 7.

39. *LYCÆNA NISA*, n. s.

Small; wings rounded; in the male violet-blue, with broad dusky margins; in the female pale ash-colour, with faint golden and violet iridescence and a few traces of azure scales; the upper wings with dusky, the lower wings with white ciliated fringe. Beneath, in both



sexes, ashy white with a golden gloss; a fine dark line on the edge of the outer margin, and within it an obscure band of very faint brown lunules; on the lower wings a small round black spot on the lunulate band between the second and third median nervules. Antennæ black-and-white ringed.

Expanse 10 lines.

*Hab.* Formosa.

A pair only of this species was sent by Mr. Swinhoe.

40. *PTERYGOSPIDEA FOLUS*, Cramer (*cicero*, Fab.).

41. *ISMENE LADON*, Cramer.

42. *HESPERIA DIVODASA*, Moore, Proc. Zool. Soc. 1865, p. 791.

43. *HESPERIA AGNA*, Moore, Proc. Zool. Soc. 1865, p. 791.

44. *HESPERIA CINNARA*, Moore, MS.

This species will, I believe, shortly be described by Mr. Moore. It is closely allied to the last, but has larger and more numerous transparent spots, eight on the upper and three on the lower wing. Like all the other *Hesperidæ* in this list, it is a common Indian species.

45. *PAMPHILA AUGIAS*, Linnæus.

46. *PAMPHILA MÆSA*, Moore, Proc. Zool. Soc. 1865, p. 509.

#### Sect. HETEROCERA.

This section is represented in the collection by examples pertaining to 72 genera, all the species of which that have been determined being found also either in China, North-eastern India, or Ceylon. The total number of species is 93, these occurring in the several tribes as follows:—

<i>Sphingites</i> . . . . .	3 genera	3 species.
<i>Bombycites</i> . . . . .	9 „	13 „
<i>Noctuities</i> . . . . .	23 „	31 „
<i>Pyalites</i> . . . . .	15 „	22 „
<i>Geometrites</i> . . . . .	9 „	10 „
<i>Crambites</i> . . . . .	2 „	3 „
<i>Tortricites</i> . . . . .	7 „	7 „
<i>Tineites</i> . . . . .	4 „	4 „
	—	—
	72	93

#### Sect. HETEROCERA.

##### Tribe SPHINGITES.

1. *LOPHURA HYAS*, Walker, List Lep. B. M. Het. pt. viii. p. 107.

2. *ACHERONTIA SATANAS*, Boisd. Spéc. Gén. Lep. i. pl. 16. f. 1 (*Acherontia lethe*, West. Cab. Orient. pl. 42. f. 2).

PROC. Zool. Soc.—1866, No. XXIV.



3. *CHÆROCAMPA SWINHOEI*, Moore, n. sp.

*Male*. Ochreous brown: fore wing suffused with greenish ochreous, and slightly black-speckled, with a greyish-brown exterior band, which is minutely black-speckled and with an inner speckled border and a slight posterior black spot, an indistinct small black discal spot; cilia alternate ochreous and black. Hind wing dull cupreous black, slightly ochreous along the exterior border; cilia ochreous. Abdomen ochreous at the sides, and with a series of subdorsal paler short streaks. Underside of the wings reddish testaceous, minutely black-speckled; base and exterior band of fore wing dusky brown.

Exp.  $2\frac{1}{4}$  inches.

## Tribe BOMBYCITES.

## Fam. LITHOSIIDÆ.

4. *HYPSA ALCIPHON*, Cram. t. 133. f. E.
5. *HYPSA EGENS*, Walk. Cat. Lep. Het. B. M. ii. p. 453.
6. *HYPSA PLANA*, Walk. ib. p. 450.
7. *HYPSA INTACTA*, Walk. ib. p. 451.
8. *UTETHESIA PULCHELLA*, Linn. (Cram. t. 109. f. E).

## Fam. CHALCOSIIDÆ.

9. *CLELEA SAPPHIRINA*, Walk. Cat. Lep. Het. B. M. Suppl. p. 465.
10. *PHALANNA POLYMENA*, Linn. (Cram. t. 13. f. D).
11. *SYNTOMIS ATEREUS*, Cram. t. 400. f. A.
12. *NYCTEMERA VARIANS*, Walk. Cat. Lep. Het. B. M. ii. p. 400.
13. Gen. undetermined.

## Fam. LIPARIDÆ.

14. *LYMANTRIA*, sp.

## Fam. ARCTIIDÆ.

15. *ALOA LACTINEA*, Cram. t. 133. f. D.
16. *ALOA BIFRONS*, Walk. Cat. Lep. Het. B. M. iii. p. 705.

## Tribe NOCTUITES.

## Fam. GLOTTULIDÆ.

17. *CHASMINA CYGNUS*, Walk. Cat. Lep. Het. B. M. ix. p. 147.

## Fam. XYLOPHASIDÆ.

18. *PRODENIA RETINA*, Guen. Noct. i. 163.



## Fam. HELIOTHIDÆ.

19. HELIOTHIS ARMIGERA, Hübn. Noct. pl. 79. f. 370.

## Fam. ACONTIDÆ.

20. XANTHODES TRANSVERSA, Guen. Noct. ii. p. 211.  
21. XANTHODES INTERSEPTA, Guen. ib. p. 212.  
22. ACONTIA MACULOSA, Walk. Cat. Lep. Het. B. M. xii. p. 795.

## Fam. ANTHOPHILIDÆ.

23. ANTHOPHILA ROSEIFASCIA, Walk. Cat. Lep. B. M. Suppl. p. 803.

## Fam. PLUSIDÆ.

24. PLUSIA VERTICILLATA, Guen. Noct. ii. 344.  
25. PLUSIA FURCIFERA, Walk. Cat. Lep. B. M. xii. p. 927.

## Fam. CALPIDÆ.

26. ORESIA EMARGINATA, Fabr. (Guen. Noct. ii. 363).  
27. ORESIA RECTISTRIA, Guen. Noct. ii. p. 363.

## Fam. GONOPTERIDÆ.

28. ANOMIS FULVIDA, Guen. ii. p. 397.

## Fam. TOXOCAMPIDÆ.

29. TOXOCAMPA METASPILA, Walk. Cat. Lep. B. M. xiii. p. 1032.

## Fam. HOMOPTERIDÆ.

30. HOMOPTERA INFLIGENS, Walk. Cat. Lep. B. M. xiii. p. 1068.

## Fam. CATEPHIDÆ.

31. ANOPHIA ACRONYCTOIDES, Guen. Noct. iii. 47.

## Fam. OPHIDERIDÆ.

32. OPHIDERES FULLONICA, Linn. (Cram. t. 77. f. C).  
33. OPHIDERES CAJETA, Cram. t. 30. f. A.  
34. OPHIDERES SALAMINIA, Cram. t. 174. f. A.

## Fam. OPHIUSIDÆ.

35. OPHIODES TRIPHÆNOIDES, Walk. Cat. Lep. B. M. xiv. 1358.  
36. OPHIUSA ARCTOTÆNIA, Guen. Noct. iii. 272.  
37. OPHIUSA STUPOSA, Fabr. (Cram. t. 273. f. E).





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