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Feb. 15 - Dec. 3, 1881.



NOTES

FROM THE

LEYDEN MUSEUM

EDITED



BY

Prof. H. SCHLEGEL,

Director of the Museum.

VOL. III.

LEYDEN
E. J. BRILL.
1881.



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1) Correction: p. 161 line 3 (from top of diagnosis), for „albo-spinosis” read „albo-annulatis”.

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N^o. 2 — April 1881, Note XIV—XXVI.

N^o. 3 — July 1881, Note XXVII—XXXIII.

N^o. 4 — October 1881, Note XXXIV—XXXVIII.

7209 Feb. 15. 1887.

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NOTE I.

ON A NEW SPECIES OF CETONIDE FROM
THE ARU ISLANDS.

BY

C. RITSEMA Cz.

Schizorrhina truncatipennis, sp. n. ♂.

This new species is closely allied to and strongly resembles *Schizorrhina Whitei* Thoms. (= *Emiliae* Thoms. ¹) nec White) of the same locality, but can at once be distinguished by the different shape of the elytra which are broadly truncated posteriorly, and strongly spined at the suture.

Length 18 mm.; breadth at the shoulders 9,25 mm. — Entirely of a bright metallic green, spotted and striped with fulvous-yellow in the following manner, which however will probably prove to vary individually as in the allied species:

on the head: a small spot between the eyes;

on the pronotum: the thickened lateral margins without however reaching the hind margin, a narrow irregularly edged line on each side, more or less parallel with the lateral margins and divided into three spots of which the anterior and intermediate ones are of an elongated shape, the posterior one of a transverse triangular shape, and two square

1) J. Thomson, *Archives entomologiques*. Tom. I (1857). p. 429; pl. 16, fig. 5.

somewhat obliquely directed spots before the median lobe; on the scutellum: two lateral elongated triangular spots touching the base;

on the elytra: three pair of spots close to the suture and lateral margins, the lateral spots more or less confluent towards the base, and less regularly shaped than the sutural ones; moreover three or four rather small spots on the middle of the disk, an elongated narrow basal spot or line between the 4th and 5th striae, and a transverse narrow line close to and parallel with the apical margin;

on the abdomen: two median transverse spots and two lateral points on the segment which precedes the pygidium, and three pair of spots on the pygidium;

on the under surface: the mesosternum and metasternum and the 1st—4th abdominal segments with lateral spots, the 5th segment with two median spots.

Head finely punctured, with an almost smooth space on the vertex, behind which the punctures are larger; the anterior margin of the clypeus upturned and inconspicuously emarginated in the middle. The clypeus with three faint impressions: two at the lateral margins, the third before the middle of the front margin.

The pronotum sparingly punctured towards the sides, the middle of the disk impunctate; the scutellum with some shallow punctures on the extreme base.

The elytra broadly truncated at the apex and strongly spined at the suture; the posterior lateral angles rectangular. The line which accompanies the suture shallow, distinctly impressed however close to the sides of the scutellum; moreover each elytron shows six longitudinal striae of very shallow punctures, the first stria being the most inconspicuous of all, whereas all along the sides behind the shoulders and on the apical portion of the elytra transverse scratches are present. The abdominal segment which precedes the pygidium transversely, the pygidium concentrically aciculated.

Legs and under surface of the thorax as in *Whitei*; the ventral segments of the abdomen less sculptured, showing only a few scratches towards the sides.

The male here described has been sent over from the Aru Islands by Baron C. B. H. von Rosenberg, together with a variety (♀) of *Schizorrhina Whitei* Thoms. which has a dark steel blue color with shades of green and purple.

Leyden Museum, October 1880.

P.S. The description of my *Schizorrhina truncatipennis* was already printed when I received Dr. Kraatz's *Genera Cetonidarum Australiae*¹⁾ containing a revision of the Australian Schizorrhinidae in which the genus *Poecilopharis* is established in behalf of *Schizorrhina buruensis* Wall. (considered as the *type* of the new genus) and its allies. In the enumeration of the species of this genus (three in number) Dr. Kraatz regards *Whitei* Thoms. (= *Emiliae* Thoms.) as a variety of *Buruensis* Wall. and places *Emilia* White between this and *Aruana* Wall.

I am however of a somewhat different opinion and regard *Aruana* Wall. and *Buruensis* Wall. as varieties of *Whitei* Thoms. Thus we come to the following synopsis of the genus *Poecilopharis* Kraatz:

I. Anterior margin of the clypeus nearly straight, scarcely emarginated; mesosternal process slightly curved.

A. Elytra with the posterior lateral angles rounded and the suture inconspicuously spined.

spec. 1. *Whitei* Thoms. (= *Emiliae* Thoms.). Aru.

var. *Aruana* Wall. Aru.

var. *Buruensis* Wall. Buru.

var. *laevipennis* Rits., with almost entirely smooth elytra, showing only some faint traces of rows of extremely small punctures. Buru

1) *Deutsche Entomologische Zeitschrift*. Bd. XXIV (1880). S. 177.

- B. Elytra with the posterior lateral angles rectangular and the suture strongly spined.
spec. 2. *truncatipennis* Rits. Aru.
- II. Anterior margin of the clypeus broadly emarginated; mesosternal process strongly curved.
spec. 3. *Emilia* White New Hebrides, and, according to the Collection of the Leyden Museum, van Diemensland (Frank) and Aru Islands (Dohrn).

November 1880.

NOTE II.

DESCRIPTION OF A NEW SPECIES OF THE LONGI-CORN GENUS CEREOPSISUS, THOMS.

BY

C. RITSEMA Cz.

Cereopsius apicalis, sp. n.

Length 21 mm., breadth at the shoulders 8 mm.; length of the antennae 27 mm.

Glabrous; brick red, with the labrum, apical joint of the palpi, apex of the mandibles, eyes, antennae, apex of the thoracical spines, legs (except the coxae and the intermediate and posterior trochanters), scutellum and extreme apical margin of the ventral segments, black, and the apical fourth of the elytra dark steel blue with a faint violet hue; the under surface of the base of the third and following joints of the antennae with a spot of whitish pubescence.

The head with a few scattered punctures and a raised narrow line, which extends from the middle of the anterior margin of the clypeus up to the prothorax, taking its course through a longitudinal impression on the clypeus and through a similar one on the vertex; another impression is present between the base of the eyes and the mandibles. The apical joint of the antennae extremely acute at the top.

The pronotum a little more short than broad at the base,

with a transverse groove near the front- and hind margin, the posterior groove shorter and less distinct than the anterior one; the lateral spines placed on the middle of the sides, very acute and slightly bent backward at the top. The disk strongly punctured (the punctures partially confluent) and provided with five very indistinct gibbosities. The mesosternum not perpendicular anteriorly but distinctly protruding. The scutellum broadly rounded at the top and covered with a black velvety pubescence.

The elytra strongly punctured, the punctures smaller and more widely spread towards the suture and the apex; the base between the shoulders and the scutellum very prominent; the apex rounded; moreover each elytron shows two slightly elevated longitudinal costae, one from the middle of the basal prominence and joining the suture at about the middle of the steelblue coloured portion, the other from between the shoulder and the basal prominence and disappearing in the steelblue region.

Under surface and legs glossy and impunctate.

A single specimen of this somewhat aberrant species from East Java (Scheepmaker).

Leyden Museum, October 1880.

NOTE III.

A NEW SPECIES OF THE LONGICORN GENUS
BACCHISA, PASC.

DESCRIBED BY

C. RITSEMA Cz.

Bacchisa nigriventris, sp. n. ♂.

Length 9,25 mm., breadth at the shoulders 3 mm.; length of the antennae 14,5 mm.

Fulvous-yellow, the head, thorax and legs somewhat darker than the elytra; the apical third of the mandibles, the eyes, the antennae (except the basal third of the scape, the base of the 2nd joint and the extreme apex), the metasternum and the abdomen, black, the segments of the latter however faintly margined with fulvous.

The head glossy, impunctate, with a narrow median dark line which extends from the front margin of the clypeus up to the pronotum. On the middle of the front margin of the clypeus a sharp tooth is present, which is directed forward, whereas the head between the upper divisions of the eyes is raised and distinctly produced into a tubercle on the forehead. A large rounded impression may be observed on the vertex. Moreover the head is provided with four tufts of long fulvous hairs, one on the tooth of the clypeus, another on the vertex between the frontal tubercle and the impression the remaining two between the inferior divisions of the eyes and the antennary tubers; of the lastmen-

tioned tufts the hairs gradually decrease in length towards the antennary tubers. The antennae glossy at the basal half, becoming opaque towards the tip, thinly covered with rather long erect yellow hairs, especially on the under surface. The scape a little longer than the 2nd and 3rd joint taken together, somewhat constricted in the middle, its apical half thicker than the basal half; the 3rd, 4th and 5th joints slightly swollen at the top and gradually decreasing in length; the following joints cylindrical and of about equal length.

The prothorax slightly constricted anteriorly and posteriorly; the pronotum glossy, showing a few punctures and some erect yellow hairs; before the hind margin there is a transverse groove, which is provided with a transverse ridge. The scutellum transverse, abruptly declivous at the top which make it appears broadly truncate.

The elytra parallel, rounded at the apex, covered with a sericeous pubescence of the same color of the tegument, and spread all over with erect yellow hairs; they are provided with punctures which are of a dark color at the bottom and larger and deeper on the basal half; the impressed line parallel with the suture shows similar punctures; on each elytron a vestige of two longitudinal costae may be observed.

The under surface covered with a thin greyish pubescence and some erect hairs, the legs with erect yellow hairs.

The specimen here described was among a small collection of Coleoptera from the island of Sumbawa, presented to the Leyden Museum by his Excellence J. W. van Lansberge.

In the same collection there was also a female specimen which differs from the above described male by its somewhat different coloration (the fulvous-yellow color being clear yellow, the posterior fourth of the elytra black; the antennae almost entirely black with only the extreme base

of the scape and the extreme apex of the last joint yellow, and the sides of the mesosternum spotted with black), by the somewhat different punctuation of the elytra (the punctures disappear almost entirely towards the apex, and the impressed line which accompanies the suture is impunctate), by the scutellum which is impressed, not declivous, at the top, and, moreover, by the following differences which however are no doubt sexual, viz: larger size (length 11 mm., breadth at the shoulders 3,5 mm), thicker and shorter antennae (of the length of the body), unarmed head (neither toothed, tuberculated nor tufted, but very broad and flat between the antennary tubers) and large somewhat swollen apical ventral segment (as long as the 2nd, 3rd and 4th taken together). — Perhaps this specimen will prove to be a variety of the female of my *Bacchisa nigriventris* for which I propose the name *apicalis*, which name might also be retained if further investigations show that the described female belongs to a distinct species.

Leyden Museum, October 1880.

NOTE IV.

SYNONYMICAL REMARKS ABOUT TWO SPECIES
OF LONGICORN COLEOPTERA IN THE
COLLECTIONS OF THE LEYDEN MUSEUM.

BY

C. RITSEMA Cz.

1. *Megacriodes ebeninus* Voll. (*Tijdschr. v. Entom.* XIV (1871). p. 111; pl. 5, fig. 11) = *Batocera Roylii* Hope (*Trans. Zool. Soc. London.* I (1835). p. 103; pl. 15, fig. 1).

N.B. The specimens from New Holland considered by the late Dr. Snellen van Vollenhoven (*l. c.* p. 215, n° 14) as belonging to *Batocera Roylii* Hope have nothing to do with the true *Roylii*. Perhaps they will prove to belong to a variety of *Batocera Boisduvalii* Hope.

2. *Megacriodes guttatus* Voll. (*l. c.* p. 110; pl. 5, fig. 10) = *Batocera octomaculata* Thoms. nec. Fabr. (Thomson, *Arc. Nat.* (1859). p. 76, n° 14).

N.B. In the *Revue et Magasin de Zoologie* for 1878 (p. 54) Mr. Thomson rectifies his determination and changes the name of the species which was regarded by him as that of Fabricius to *Fabricii*. This change of name however was superfluous since the species had been described anew under the above mentioned name by the late Dr. Snellen van Vollenhoven.

Leyden Museum, October 1880.

NOTE V.

ON A NEW GENUS OF LONGICORN COLEOPTERA
BELONGING TO THE GROUP OF THE BATOCERIDAE.

BY

C. RITSEMA Cz.

Rosenbergia, g. n.

Characteristics of the genus *Batocera*, but with acutely produced mesosternum, entire scape which is neither incised nor scarred at the tip, and smooth antennae and forelegs. Moreover the apical joint of the antennae is transversely divided behind the middle, although not so distinctly as in the genus *Apriona*.

I have named this genus in honor of the well known traveller in the Malayan Archipelago Baron C. B. H. von Rosenberg, who has brought home one of the two species which will here be described.

1. *Rosenbergia mandibularis*, sp. n. ♂.

Length 50 mm., breadth at the shoulders 17 mm.; length of the antennae 83 mm. — Dark piceous, approaching to black; entirely covered with a close fulvous tomentum, which is finer and thinner along a streak on the lateral margins of the elytra which is therefore of a more blackish tinge; round the eyes the pubescence is ferruginous, on the tarsi it is intermixed with stiff black hairs and on the antennae it is of a more greyish black color, which becomes darker towards the end; moreover the middle of

several of the median joints of the antennae is inconspicuously spotted with a greyish pubescence.

Impunctate. The head very large; the eyes large, subapproximate in front; the mandibles very large and flat knicked at the middle, the outer margin of the basal portion straight and terminating in a small but distinct tooth, the outer margin of the apical portion and the inner margin curved. A naked and glossy somewhat bottle-shaped small spot between the upper lobes of the eyes. The scape of the antennae not quite half as long as the 3rd joint, the 3rd joint one fourth longer than the 4th, the 4th—10th slightly decreasing in length, and the apical joint, which is suddenly pointed at the tip, one third longer than the 10th joint.

Between the lateral spines, which are strong and acute, and obliquely directed upwards, the disk of the thorax shows some sinuated transverse wrinkles, and behind these a few naked very small granules more or less arranged in two groups. The scutellum triangular, broadly rounded and deeply emarginated at the apex.

The elytra much attenuated towards the apex, with a transversely directed acute tooth at the shoulders, and with some widely spread glossy black granules on the basal portion; at the base of the suture, just behind the emargination of the scutellum, two longitudinal granules are present; the elytra are truncated and provided with four spines posteriorly; moreover they show on the disk of the basal half three large although faint gibbosities, just as in *Abatocera leonina* Thoms., one conjointly on both elytra and divided by the suture, the remaining two a little more backwards and placed more laterally.

The lateral posterior angles of the fifth ventral segment are acutely produced.

A single male specimen from Doreh (von Rosenberg).

Obs. This specimen is mentioned by the late Dr. Snellen van Vollenhoven as *Apriona* n^o. 24 in *Tijdschrift voor*

Entomologie. Vol. XIV (1871) p. 217; pl. 9, fig. 4, whereas *Apriona* n^o. 25 of the same Author (*l. c.* pl. 5, fig. β and pl. 9, fig. 5) is a female specimen of *Abatocera leonina* Thoms.

2. *Rosenbergia vetusta*, sp. n. ♂.

Length 40,5 mm., breadth at the shoulders 14 mm.; length of the antennae 51,5 mm. — Black; entirely covered with a close whitish tomentum, more or less fuscous on the tibiae outside, intermixed with stiff black hairs on the tarsi, and of a mouse-grey color on the fifth and following joints of the antennae; the middle of some of these joints however is inconspicuously spotted with a greyish pubescence.

Impunctate. The head large, the eyes large, sub-approximate in front; a naked and glossy bifurcate spot between the upper lobes of the eyes, and some naked and flattened granules along the hind margin of the upper lobes. The scape of the antennae half as long as the 3rd joint, the 3rd joint one third longer than the 4th, the 4th—10th of equal length, the 11th joint one third longer than the 10th.

The pronotum with two raised transverse lines close to the anterior margin, and three similar ones on the middle of the disk, of which the median one is widely interrupted in the middle and the posterior one shortened at both sides; behind these raised lines as well as on the base of the lateral spines which are straight and naked at the tip, some naked flattened granules may be observed. The lateral margins of the scutellum nearly parallel, the apex broadly rounded.

The elytra much attenuated towards the apex, with a short transversely directed tooth at the shoulders, and provided on the basal half with glossy black slightly transverse granules which are very densely set on the shoulders. On the posterior half of the elytra a few similar

although not raised granules are present, and two longitudinal ones on the suture just behind and touching the scutellum; the elytra are truncated and provided with four spines posteriorly; the sutural spines are much more developed than the lateral ones.

The apical margin of the fifth ventral segment very slightly emarginated.

A single male specimen from Doreh (Hoedt).

Obs. This species somewhat resembles the figure of a white variety of *Apriona punctatissima* Kaup from Sanghir, given by R. Oberthür in *Annali del Museo Civico di Storia Naturale di Genova*. Vol. XIV (1879). Tav. I, fig. 3.

Leyden Museum, November 1880.

NOTE VI.

DESCRIPTION OF A NEW SPECIES OF THE
LONGICORN GENUS PRAONETHA, PASC.

BY

C. RITSEMA Cz.

Praonetha Moensii, sp. n.

This new species belongs to Pascoe's § 1 «Elytra scarcely (or not at all) crested, the apex rounded,"¹⁾ and is closely allied to *P. subtineta* Pasc. (*l. c.* p. 170) from Java and *P. Bowringii* Pasc. (*l. c.* foot-note) from Hong Kong, but may easily be distinguished from the first species by the absence of the angular emargination of the anterior border of the prothorax, and from the second by the absence of the small black tufts on the raised lines of the elytra, etc.

Length 12 mm. — Reddish brown, covered with a red pile on the head (on the labrum however the pubescence is of an ashy color), thorax, base and apical third of the elytra, legs (except the dark tarsi) and under surface of the body except the apical segment of the abdomen which is naked but for a few dispersed white short hairs; a very broad band of a greyish pubescence across the middle of the elytra showing on each elytron a large triangular la-

1) F. Pascoe, *Longicornia Malayana*. p. 164.

teral spot of a similar red pile, the top of which is directed inwards and backwards, but does not reach the suture. The antennae dark coloured, the fourth joint spotted with grey and red pubescence, the following joints ringed with ashy pubescence at the base. The pubescence of the scutellum black, with three red dots: two basal lateral ones, the third at the apex. The elytra at the base on each side of the scutellum with a small spot of an ashy pubescence, their basal crest crowned with black hairs. The whole surface of the insect is overspread with small black dots and, especially on the antennae and legs, with white stiff hairs, which are longer and erect on the under surface of the body and on the legs.

Head sparingly, prothorax very densely punctured, the latter subtransverse, the sides straight and parallel, the anterior border not emarginated. The antennae shorter than the body, reaching the base of the apical third of the elytra. The scutellum broadly rounded at the apex. The elytra gradually narrowing on the basal two thirds of their length, more conspicuously on the apical third which is declivous; the apex rounded; the basal crest very small. The punctuation of the elytra consists on the basal third of deep pits, on the apical two-thirds of deep punctures. The costae and sutural margins are distinctly although not strongly raised. The under surface of the body impunctate, with the exception of the sides of the metasternum which show some strong punctures; the apical ventral segment is provided with an impressed longitudinal median line, extending from the basal margin up to the apical one.

Hab. Bandong (Preanger-Districts, Java) (Bernelot Moens).

Leyden Museum, November 1880.

NOTE VII.

ON A POSTTERTIARY FAUNA FROM THE STREAM-TIN-DEPOSITS OF BLITONG (BILITON).

BY

Dr. K. MARTIN.

PROFESSOR OF GEOLOGY.

[November 1880.

Mr. C. de Groot has lately presented to the Museum a collection of beautifully preserved shells etc., which he has brought together among the stream-tin-deposits of Blitong, in the district of Tandjoeng Pandang, mine N^o. 8, Djitjong. Mr. de Groot tells me that these deposits are occasionally regarded as tertiary, and he requested me to give a more exact determination of their age, with the aid of the material collected by himself. I was soon convinced, that the fauna in question belongs to a very recent past, and for this reason it may be more interesting for zoologists than for palaeontologists. In the first place there can be no doubt, that species occurring in posttertiary strata must belong, when representatives of the same species are still living, to the same zoogeographical area of the present time, in which that species is now found. Consequently they may serve to verify the localities from which shells etc. are said to have come, both according to the zoological literature and to the specimens in the musea. A change may however have taken place in the distribution of the animals in these areas with regard to the several islands during

the posttertiary epoch as well. Still when similar faunas, as the one here described from Blitong, will gradually become known from a number of other islands, they can yield interesting results with respect to the distribution of animals at a former period. For this reason I resolved to publish the following list in this journal.

I succeeded in identifying sixty specimens of the sixty-eight contained in the collection of Mr. de Groot with still living forms. A single specimen, *Cerithium montis Selaë Mart.*, has hitherto only been observed in strata from Mount Sela of Java (accompanied by *Cypraea arabica* Lin., also occurring in Blitong), in strata, to which I have assigned the name of „recente Meeresbildungen” (Comp. Die Tertiärschichten auf Java. Allg. Theil pag. 34). As to the remaining seven specimens, which belong to the genera *Balanus*, *Vermetus*, *Pinna*, *Chama*, *Lucina*, *Tellina*, *Trachyphyllia*, the five first represent forms, of which the exact determination can hardly be successful, when only undertaken by the aid of the literature on the subject, and as I have not been able to compare them with recent representatives of allied forms, it is very possible, that they do belong to recent species. As to *Tellina* and *Trachyphyllia* I hold them to belong to new species¹⁾. At all events those seven organisms left undetermined are of no consequence in defining the age of the stream-tin-deposits from Blitong as „posttertiary”, because moreover not one of all the species in question has been observed in the tertiary strata of the Indian archipelago.

This result is further supported by the extraordinary good state of preservation of most of the remains. There is a great number of shells with traces of colour and some of them are only distinguished from the recent representatives by a somewhat fainter coloration. Other specimens,

1) I cannot make it out with certainty, because the zoological literature at hand in Leyden is deficient in many respects.

for example *Bulla naucum*, *Cerithium asperum*, *Cer. vertagus*, *Cer. procerum*, which, as it is known, are only little or not at all coloured, could never have been distinguished from recent individuals, if the locality, where they were found, had remained unknown, because even the polish of the shells is sometimes well preserved.

With exception to *Prionastraea tesserifera* Ehrbg., which has hitherto only been found in the Red sea, all animals mentioned in the following list belong to the fauna of the Indian archipelago according to the statements in the literature on the subject or to the specimens contained in the collections at Leyden and Amsterdam. Moreover the corals of the Indian ocean are very little known, and considering the fact, that a great number of them also occur in the Red sea, *Prionastraea tesserifera* Ehrbg. cannot change our opinion:

That the fauna of the stream-tin-deposits of Blitong agrees ¹⁾ with that of the sea surrounding the island of Blitong in the present time, that therefore these deposits must be regarded as a posttertiary formation, which is equivalent, so far as can be judged by the facts hitherto observed, to strata from Mount Sela of Java.

LIST OF SPECIMENS.

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| <p>CRUSTACEA.</p> <p>1. <i>Balanus amaryllis</i> Darw.</p> <p>MOLLUSCA.</p> <p>a. <i>Cephalopoda</i>.</p> <p>2. <i>Nautilus pompilius</i> Lin.</p> <p>b. <i>Gasteropoda</i>.</p> <p>3. <i>Strombus urceus</i> Lin.</p> | <p>4. <i>Strombus isabella</i> Lam.</p> <p>5. <i>Strombus canarium</i> Lin(?)</p> <p>6. <i>Pteroceras lambis</i> Lam.</p> <p>7. <i>Terebellum subulatum</i>
Lam.</p> <p>8. <i>Murex adustus</i> Lam.</p> <p>9. <i>Murex crassispina</i> Lam.</p> |
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1) There is even a great conformity in the varieties, both of the species from the Blitong-sea and the species from the Blitong stream-tin-deposits.

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|---|---|
| 10. <i>Murex haustellum</i> Lin. | 37. <i>Cardium angulatum</i> Lam. |
| 11. <i>Pyrula vesperilio</i> Lam. | 38. <i>Circe undatina</i> Lam. |
| 12. <i>Cassis glauca</i> Lam. | 39. <i>Cardita phrenetica</i> Lam. |
| 13. <i>Oliva textilina</i> Lam. | 40. <i>Venus Listeri</i> Gray. |
| 14. <i>Conus marmoreus</i> Lin. | 41. <i>Venus marica</i> Lin. |
| 15. <i>Voluta scapha</i> Gmel. | 42. <i>Cytherea erycina</i> Lam. |
| 16. <i>Cypraea arabica</i> Lin. | 43. <i>Cytherea picta</i> Lam. |
| 17. <i>Natica mamilla</i> Lam. | 44. <i>Tapes litterata</i> Lin. |
| 18. <i>Natica chinensis</i> Lam. | 45. <i>Tellina lingua felis</i> Lin. |
| 19. <i>Cerithium asperum</i> Brug. | 46. <i>Tellina virgata</i> Lin. |
| 20. <i>Cerithium vertagus</i> Brug. | 47. <i>Solen brevis</i> Hanl. |
| 21. <i>Cerithium procerum</i> Kien. | 48. <i>Solen corneus</i> Lam (?) |
| 22. <i>Cerithium montis Selae</i>
Mart. | 49. <i>Selecurtus candidus</i> Quoy
et Gaim. |
| 23. <i>Trochus maximus</i> Koch. | 50. <i>Aspergillum annulosum</i>
Desh. |
| 24. <i>Trochus maculatus</i> Lin. | 51. <i>Septaria arenaria</i> Lam. |
| 25. <i>Trochus acutus</i> Lam. | |
| 26. <i>Bulla naucum</i> Lin.
<i>c. Conchifera.</i> | ECHINODERMATA. |
| 27. <i>Ostrea crista galli</i> Chemn. | 52. <i>Salmacis sulcata</i> Ag. |
| 28. <i>Placuna sella</i> Lam. | 53. <i>Laganum depressum</i> Less. |
| 29. <i>Pecten senatorius</i> Lam. | 54. <i>Peronella decagonalis</i> Ag. |
| 30. <i>Pecten radula</i> Lam. | 55. <i>Arachnoides placenta</i> Ag. |
| 31. <i>Spondylus aculeatus</i>
Chemn. | 56. <i>Brissus carinatus</i> Gray. |
| 32. <i>Arca antiquata</i> Lin. | CORALLIA. |
| 33. <i>Arca navicularis</i> Brug. | 57. <i>Galaxea fascicularis</i> Oken. |
| 34. <i>Arca fusca</i> Brug. | 58. <i>Prionastraea tesserifera</i>
Ehrbg. |
| 35. <i>Cardium rugosum</i> Lam. | 59. <i>Cycloseris cyclolites</i> E. H. |
| 36. <i>Cardium papyraceum</i>
Chemn. | 60. <i>Pavonia crassa</i> Dana. |
| | 61. <i>Madrepora appressa</i>
Dana (?) |

Remarks upon certain of the above mentioned remains.

Ad 5. There is one individual with partly restored shell. The restored part, which is separated by a distinct furrow both from the spire and from the old part of the body-

whorl, shows rather strong varices. These varices, which have not been observed in *Str. canarium* L. might be regarded as abnormal, were it not for a similar varix, which, though rather inconspicuous, is nevertheless present on the uninjured part of the bodywhorl. For this reason the determination of *Str. canarium* L. remains somewhat doubtful.

Ad 8. Both the extremes of variation of this species, *macro-* and *micro-phyllus*, are represented in the collection of Blitong, strictly agreeing with similar specimens from the Indian ocean.

Ad 22. When I established this species (*Die Tertiär-schichten auf Java. Palaeontolog. Theil p. 66*), I was not able to compare its internal structure with that of *C. telescopium* Brug. The specimen from Blitong, which is open on one side, shows a columella with a strong, flat, bandlike fold, provided with a very distinct longitudinal furrow; in *C. telescopium* Brug. the fold is more sharp-edged than flat and the furrow very inconspicuous. This affords a new proof for the specific distinctness of *C. montis Selae Mart*, even if one might be inclined to regard the specimens designated by this name as identical with such of *C. telescopium* Brug, of which the ridges had been worn out. The good state of preservation of the javanese specimen affords another argument against this view.

The strong prominent fold however, which may be observed internally on the anterior surface (when the animal is placed in its normal position) of the whorls, is no characteristic difference, as it is present in both species. Moreover it is not visible in complete specimens, being absent in the latter half of the bodywhorl.

Ad 26. Amongst the Blitong specimens I also find the variety, which is distinguished by having a smooth band on the middle part of the shell, a variety, which was already mentioned by Lamarck (*Hist. nat. des anim. sans vert. VII p. 670*) and which is also found in the collections of the Leyden Museum.

Ad 30. Both specimens have only 9—11 ribs; the recent ones generally have 12. This reduced number, constituting a variety, which is often recorded for other species as well, is no objection to their identification with *P. radula* Lam.

Ad 38. All the specimens belong to the variety „*depressa*” (Conf. Roemer. Monographie der Molluskengattung Venus).

Ad 48. The identification remains doubtful, as the right valve, which alone is available, is relatively a little less high than the valves of *Solen corneus* Lam., which I had occasion to compare.

Ad 50. Only a part of the tube is present and was separated from *A. javanum* Lam. because of the strongly marked annulation.

Ad 59. A series of specimens of this species entirely corresponds with recent specimens from Blitong now in the Leyden Museum. One specimen measures 70 mm. in length, 36 mm. in height and has moreover a very concave undersurface. This is an extreme of variation, towards which the *Fungia glans* figured by Dana (Zooph. p. 290 tab. 18 fig. 2) forms the transition. H. Milne Edwards has already noticed, that *Fungia glans* Dana would eventually prove to be synonymous with *Cycloseris cyclolites* E. H. (Corall. III p. 50).

Ad 60. As far as could be made out from Dana's figure and description, certain recent specimens from the Indian archipelago, contained in the collections of the Leyden Museum, belong to *Pavonia crassa* Dana. With these recent specimens the one from the stream-tin-deposits could be identified with certainty, and so at all events the species of Blitong is one, which still occurs in the Indian ocean.

NOTE VIII.

ON THE WINTERNEST OF THE DWARF-MOUSE
(MUS MINUTUS).

BY

H. SCHLEGEL.

December 1880.

The mode of nidification of the Dwarf- or Harvest-Mouse, essentially different from that of its congeners, is a fact well known to naturalists, and so singular in its nature, that it must attract the curiosity of every one.

Little, however, is known about the varieties which the nests present and nothing at all about the very different kinds of nests, which the little animal builds in certain localities for its retreat in the cold season.

Although spread over a great part of Europe as far as Western Asia, the Dwarf-Mouse is generally reputed a species of rare occurrence. This fact finds its explication in several circumstances. The little creature easily escapes the attention of man on account of its diminutive size and the rapidity of its motions. In other instances it is taken, notwithstanding the difference in colour, for the young of the common wild mouse (*Mus sylvaticus*). The nests are generally regarded by the people as bird's nests, and this goes so far, that even experienced hunters could not be convinced of the contrary. When I called the attention of some mowers to these nests, they assured me, that they had occasionally seen them in the fields,

but had always looked upon them as a mere conglomeration of dry grass. The greatest difficulty to observe these little animals lies in the particular mode of their distribution over the country. In general, they occur in isolated couples in brushwood, cornfields and meadows, but nobody will be aware of their presence, unless he detects one of their nests; and if he has the rare luck to find one, he will soon conclude, that the species is spread over the country in single couples living at great distances from one another. It is indeed an exceptional case, when they are found forming a colony, and such a one is sometimes restricted to a locality of little extent. When surprised by inundation of the meadows, they are sometimes seen flocking together in considerable numbers, trying to save themselves by climbing up to the crown of grass and plants.

The system of colonisation of this animal is, however, not permanent, the colony being often reduced in the following year to a small number of couples. No doubt, that the increased number produced by a favourable multiplication in certain years, contributes to the fluctuation observed in the distribution of these animals.

I now purpose to enter into some details about a colony of the Dwarf-Mouse I met with in the summer of the year 1868, in a locality, not examined before that time in its whole extent, and of which colony only a small number of couples remained in the following years. This locality is situated at the distance of about two miles from the town of Leiden, in the neighbourhood of the castle of Endegeest, celebrated for having served as a refuge to the philosopher Descartes, after his exile from France. There exists, on the right side of the road, leading to the neighbouring village of Rynsburg, not less celebrated for its Abbey and as the residence of the freethinker Spinoza, a ditch of about a quarter of a mile in length and six paces in width, intersecting a field planted with vegetables. Its right border was for one half of the length, grown with high reed, the other

longitudinal half showing no vegetation. The ditch, however, being blind at the end, became partly dry, by evaporation, during the hot season. It was in the reeds of this ditch, that a part of the colony of the Dwarf-Mouse had settled and had built their nests, also making use, for this purpose, of the herbs growing near the border side.

After having detected the colony, I gave my orders to a man, who for more than forty years has been in the service of the Museum, and who has no other charge than accompanying myself or our sportsmen when out in the field, a man who catches birds, fishes and other animals, seeks nests and eggs of birds and gathers all sorts of objects from the sea-shore. During the whole year, he was to go to the spot every week, in order to observe the little mice in question, and to extend his excursions, in search for others, for several miles in the neighbourhood, whereas I myself from time to time visited the field of our observations.

It soon appeared, that the reeds of the ditch contained about fifty nests of the Dwarf-Mouse, that isolated nests were found in the neighbouring lanes, scattered here and there in herbs growing amongst the brushwood, and that a small part of the colony had established itself, likewise in herbs amongst brushwood, at the distance of about a mile from the principal colony, occupying the reeds of the ditch. The nests of this smaller colony were likewise scattered in places fit for the purpose, and their number observed did not exceed about twenty.

The discovery of so considerable a number of the curious nests of the Dwarf-Mouse, in a comparatively limited space, afforded great satisfaction, the more so as a previous and active search after them during forty three years had led to no other result than the discovery of two such nests: the one found, in the year 1853, among the branches of a shrub of *Hippophaë rhamnoides*, in the downs to the north of the village of Noordwijk upon Sea; the other, found in the year 1854, placed in one of the

oakshrubs growing southward of the aforesaid locality, about a mile distance from the seashore.

Wishing to preserve from destruction the colony of the interesting little animal, established in the neighbourhood of my residence, I selected for our collection no more than about twenty nests, showing the different modes of variation, which they present in general.

I must state beforehand, that the ditch, concealing the largest number of nests of the Dwarf-Mouse, was also inhabited by a couple of *Calamodyta arundinacea* and by an other couple of *Calamodyta phragmitis*, that two couples of *Calamodyta palustris* had established themselves in the herbs of the immediate outside border of the reeds, and that the nests of all these birds were found and collected.

The nests of the Dwarf-Mouse are in general of a globular form, of the average size of a man's fist, and show, on one side, somewhat towards the top, a circular opening, sufficiently wide for the entrance of the little animal. The nests, found in the ditch, were commonly placed towards the top of the reeds; for those, built on the outside of the water and in the shrubs, the animals had chosen gramineous plants and all sorts of herbs, especially *Rubus fruticosus*, *Rumex acetosa* and *Epilobium*. It happens even, that our little animal, probably pressed by the necessity of bringing forth its progeniture, accommodates for this purpose one or the other bird's nest within its reach, by covering these nests with a cap of grass. In the two instances observed of this kind, one of the nests belonged to *Calamodyta arundinacea*, the other to *Sylvia cinerea*, the latter one still containing the broken eggs of the bird.

Several nests contained the still naked young mice. As to the old mice, there was no other way to get hold of them than catching them with the hand, while they are in their nest or about to enter it. And even in this way, chance alone could insure success, the movements of the little creature being performed with sur-

prising agility, even whilst climbing, their tail partly twined about the reeds or branches, a particularity, also observed by Pallas with respect to *Mus vagus* and *Mus betulinus*. It was in vain that we set out traps of different structure and provided them with all kind of bait, — *Mus sylvaticus* and *M. musculus* were from time to time caught in those traps, but never a single *M. minutus*.

I think it worth while, to mention here the singular fact of a specimen of *Mus minutus*, observed in the year 1851, as a straggler in the middle of the town of Leiden. A living specimen of this mouse, having been caught in a trap of iron network, placed in a room, was brought to one of the inhabitants, then a student at the University. This gentleman, Mr. R. T. Maitland, as an experienced naturalist at once recognized the species, and seeing that the specimen was a pregnant female, he shut it up in a bird's cage, at the same time putting into it a quantity of papershreds, cotton and other soft matter. The little animal soon afterwards began to build a nest in the wonted globular form, and to deposit in it two young ones.

I now return to our colony of mice in the ditch. After the breeding season, the reed of the ditch was cut down, with the exception of a small patch of reed, in the middle of the ditch and beyond the reach of the mowers. We then saw to our great astonishment, that our little mice established between these reeds nests of a very different character from those, destined to receive their progeniture. They were composed of different watermoss (*Hypnum*), covering the surface of the bottom of the ditch, which for want of water had almost become dry, and attached between several stems of reed, exactly like the nests of most of the reed-warblers, but of a fusiform shape, from one half to one foot high and from three to four inches in diameter about their middle. These nests, placed at the height of one foot above the level of the water, showed no inlet. The animal, when trying to make use of this refuge, removed that part of the upper covering of

the nest, which is less densely interwoven and is soon entirely concealed between the moss. This part of the nest serves at the same time as a store-house for some winter-provision, as was proved by some remnants of coleopterous and a few other insects.

The Dwarf-Mouse choosing, in dry parts, heaps of grass or straw for a winter-retreat, or concealing itself among shrubs and herbs, it is evident that the building of the peculiar sort of winter-nests, such as we have described, is owing to a just calculation of being safe against the danger of drowning.

NOTE IX.

DESCRIPTION OF A NEW SPECIES OF THE COLEOPTEROUS FAMILY ELATERIDAE.

BY

C. RITSEMA Cz.

Agraeus constrictus, sp. n.

Length 6 mm.; breadth at the shoulders 2,5 mm. — Black; the antennae, with the exception of the basal joint, and the palpi, pale ferrugineous; the basal joint of the antennae, the margins of the prothorax, the under surface of the body, and the legs, dark brown-red. — Rather elongate, strongly punctured all over, the punctures on the prothorax and on the under surface of the body somewhat smaller than those on the head and on the elytra.

The head with a large, somewhat pear-shaped longitudinal impression. The prothorax slightly transverse; the lateral margins flattened, and, a little behind the middle, angularly constricted; the sides of the anterior portion strongly and regularly rounded, those of the posterior portion divergent and minutely sinuated before the acute posterior angles, which are directed backwards. The middle of the disk raised towards the anterior margin so as to form a conical gibbosity which is emarginated at the top and covered with erect fulvous hairs; on both sides of this gibbosity an oval patch of a long and dense pale

yellow pubescence is present. On the middle of the posterior margin, opposite to the scutellum, a small although very distinct tubercle may be observed. The scutellum of a somewhat elongate pentagonal shape.

The elytra strongly and regularly convex, and as broad as the thorax, although a little broader just before the middle; the apical half narrowed in a curvilinear manner; the apices conjointly rounded. The elytra are sparingly covered with erect hairs, either black or fulvous according to different lights, and provided on the middle of the basal half at some distance from the suture with two tufts of similar hairs; moreover they show, especially on the apical half, some small spots of a white scale-like pubescence.

A single specimen from West Java (Batavia; Dr. C. de Gavere).

Leyden Museum, November 1880.

NOTE X.

NEW SPECIES OF PACHYTERIA, A GENUS OF
LONGICORN COLEOPTERA.

DESCRIBED BY

C. RITSEMA Cz.

Pachyteria rugosicollis, sp. n. ♂ and ♀.

Length of the male 28 mm., of the female 32 mm.; breadth at the shoulders in the male 8,5 mm., in the female 10 mm.

The head (labrum and mandibles excepted), the prothorax and a streak on the apical half of the elytra along the suture metallic green, the remaining portion of the apical half of the elytra, the scutellum and the under surface of the body cyaneous, the latter tinged with faint shades of green and purple; the mandibles, the upper surface of the scape and of the extreme base of the 3rd joint, and the 2nd, 9th, 10th and 11th joints of the antennae as well as the legs (except the basal three-fourths of the tibiae) black; the labrum, the anterior margin of the clypeus, the under surface of the scape of the antennae and the basal three-fourths of the tibiae brown, the 3rd-8th joints of the antennae and the basal half of the elytra luteous.

The head strongly punctured, the punctures confluent on the vertex which moreover is provided with a smooth raised longitudinal line; the punctuation on the labrum,

on the outside of the mandibles and on the space between the eyes and the mandibles is much finer; the front surface of the mandibles is smooth, impunctate. The longitudinal groove between the antennary tubers, which are slightly pubescent, is continued down to the anterior margin of the clypeus, and crossed by a transverse groove between the lower lobes of the eyes. The scape of the antennae, which are stouter and comparatively shorter in the female than in the male, is finely rugose in consequence of a dense punctuation; the third joint is about as long as the two following joints taken together.

The prothorax distinctly longer than broad at the base, armed on the middle of the sides with a short tooth-like angle; the anterior and especially the posterior margin strongly upturned; the upper surface transversely rugose, the intervals provided with large punctures. The scutellum elongate-triangular, sub-acute at the apex and covered with a black velvety pubescence.

The elytra gradually narrowing from the base, their apices slightly emarginate; the luteous coloured basal half and the green streak along the suture on the apical half strongly and rather closely punctured; the remaining blue portion of the apical half finely and most closely punctured, and moreover covered with a black velvety pubescence.

The under surface of the thorax covered with a silvery pile, except on the sides of the metasternum, where it has a black color; the under surface of the abdomen naked, with the exception of transverse lateral patches of a very dense silvery pubescence on the apical half of the segments. The metasternum is provided with a longitudinal impressed line, and as well as the abdomen, sparingly covered with punctures of different size. The apical margin of the fifth ventral segment is bisinuated in the female, broadly emarginated in the male; in the latter sex the apical (6th) ventral segment shows a horseshoe-shaped emargination, whereas the apical dorsal segment is narrowly

emarginated on the middle of the hind border. The femora are strongly, the tibiae very finely and densely punctured.

The described couple of this species has been captured in East Java (Mount Ardjoeno) by Mr. W. E. J. Hekmeyer

Pachyteria puncticollis, sp. n. ♀.

Much resembling the foregoing species and of the same locality, but distinct from it at a glance by the different sculpture of the pronotum which is punctured and not transversely rugose, by the absence of the longitudinal groove on the clypeus and of the transverse one between the eyes, by the rounded apex of the elytra, by the more slender antennae and legs, etc.

Length 30 mm.; breadth at the shoulders 9 mm.

Cyaneous, faintly tinged with green on the head and on the apical half of the elytra, and tinged with purple on the hind tibiae. The 3rd—6th and the base of the 7th joint of the antennae, as well as the basal half of the elytra luteous, the 7th and following joints of the antennae (the base of the 7th excepted) black; the anterior and intermediate tibiae inconspicuously spotted or striped with brown.

The head rather densely punctured, with a large more or less heart-shaped smooth impression on the face; the longitudinal groove between the antennary tubers is continued through a smooth space on the vertex. The scape of the antennae is densely punctured on the upper surface, almost impunctate on the under surface; the 3rd joint rather slender, not quite as long as the two following joints taken together.

The prothorax very broad on the middle in consequence of the strongly angular sides, transversely sulcated anteriorly and abruptly depressed and constricted posteriorly; the anterior margin not at all, the posterior one slightly upturned. The disk remotely covered with large, deep punctures; the depressed posterior portion provided with an indistinctly raised transverse line. The scutellum velvety black, elongate-triangular, with acute apex.

The elytra gradually narrowing from the base, their apices conjointly rounded; the suture impressed from a little before the blue coloured apical half down to a little before the apex; another although slight longitudinal impression is present on each elytron between the sutural impression and the lateral margin, and extends from a little before the blue coloured apical half as far as the apical fourth of the elytra. The luteous coloured basal half of the elytra is covered with large and closely set punctures, which however become fine and dispersed towards the base and the suture. The punctuation on the blue coloured apical half and on the small impressed portions of the basal half is very fine and extremely dense, except on the streak between the sutural and lateral impression where the punctures are larger and wider apart. The impressed regions are moreover covered with a velvety pubescence, which has a black color on the blue portion and a luteous color on the luteous portion of the elytra.

The under surface of the thorax partially covered with a thin silvery pile; the under surface of the abdomen naked with the exception of a little transverse patch of a silvery pubescence on the sides of the four basal segments. The metasternum is provided on the middle with a longitudinal impressed line and covered on the posterior half with some large punctures; the ventral segments of the abdomen are densely covered with almost imperceptible punctures intermixed with a few larger ones; the 5th ventral segment shows a broken pro-apical margin which is preceded by a semilunar impression; the apical margin is slightly emarginated.

The legs are slender, especially the posterior pair, the femora of which are almost linear, whereas the metatarsus of the same pair is distinctly longer than the two following joints taken together. The femora are strongly, the tibiae very finely and densely punctured.

Hab. East Java (Mount Ardjoeno). — Mr. Scheepmaker of Socrabaya has presented two female specimens of this species

to the Entomological Collections of the Zoological Garden „Natura Artis Magistra” at Amsterdam; one of these specimens however is now in the Collection of the Leyden Museum.

There is another *Pachyteria* in the Collection of the Leyden Museum which I believe to belong to a distinct species, although it is most closely allied to my *P. puncticollis*.

For this species, which was regarded by the late Dr. Snellen van Vollenhoven as *P. bicolor* (Dej.) Parry ¹⁾, I propose the name of

Pachyteria affinis, sp. n.

As was mentioned above, this species is so closely allied to *P. puncticollis* Rits. that it will be sufficient to point out the differences. It is a pity that the single specimen which I have before me and of which the locality is unknown is mutilated: of the antennae the two basal joints and the base of the third joint only are present, of the abdomen the three basal segments and the base of the fourth only.

The present species is somewhat broader than *puncticollis* and has the legs much stouter. The head, the thorax, the scutellum, the streak on the apical half of the elytra between

1) In volume V (p. 182) of the *Transactions of the Entomological Society of London*, Mr. J. F. S. Parry gives the following short description of his *Pachyteria bicolor*:

„Nigra, elytrorum dimidio anteriore, antennarum articulis septem primis, tibiis anterioribus tarsisque flavis, elytrorum dimidio posteriore obscure viridi nitido. — Long. 1½ inch. — Habitat Java”.

Moreover Mr. Parry says: „This beautiful insect is one of the numerous undescribed species to be found in the catalogue of the late Count De Jean’s collection, and having been assured by a letter lately received from my friend Dr. Schaum, from Paris, of the identity of the species, I have thought it not unworthy of a place in our *Transactions*.”

I wrote to Mr. Parry whether I might be allowed to compare the type specimen of this species, but I received the following disappointing answer: „I parted with my Longicorns many years ago, but cannot say who possesses the species you attach to,” and so I have been obliged to make use of the description only, which however neither corresponds with my *Pachyteria affinis*, nor even with the accompanying figure (*l. c.* pl. 18, fig. 5).

the sutural and lateral impressions, and the anterior and intermediate femora of a metallic green color; the two basal joints of the antennae, the entire anterior tibiae, and the intermediate and posterior tibiae with the exception of the apex, bright brown; moreover a chestnut-coloured stripe on the under surface of the femora towards the base. The impressed smooth space on the face not so well defined. The prothorax comparatively less transverse, the anterior margin distinctly upturned, the disk with a short but distinct longitudinal impression on the middle, just behind the anterior transverse groove; of this impression however a faint trace may be observed in *puncticollis*. The under surface of the body more equally covered with a silvery pile, which is not restricted to lateral patches on the ventral segments.

Sex and habitat unknown.

Pachyteria parallela, sp. n. ♀.

Length 21 mm.; breadth at the shoulders 5,25 mm.

Black, with the basal half of the elytra and the seven apical joints of the antennae luteous, the 4th joint of the antennae with a brown spot on the outside; the black coloured portions tinged with blue, green and purple. The apical half of the elytra, and the 2nd, 3rd and 4th joints of the antennae covered with a black velvety pubescence, the legs with a thin black pubescence, the under surface of the body with a sericeous pile, denser and with a brilliant silvery gloss on the apical half of the four basal ventral segments; the 5th segment is almost naked.

The head and the scape of the antennae rugose in consequence of a very dense punctuation which is however more dispersed on the anterior half of the clypeus, on the labrum and on the outside of the mandibles, and very fine on the space between the eyes and mandibles; the front surface of the mandibles and a transverse streak just above the clypeus and extending up close to the inner

orbit, impunctate; the longitudinal groove between the antennary tubers is not continued on the clypeus; a raised longitudinal line is present on the middle of the vertex. The 3rd joint of the antennae is distinctly longer than the 4th and 5th joints taken together.

The prothorax armed with a rounded tubercle on the middle of each side, sharply and transversely carinated anteriorly and posteriorly, transversely bisulcated anteriorly, unisulcated posteriorly, the anterior and posterior margins strongly upturned; the upper surface rugose and opaque, with the exception of the transverse sulci and a small smooth spot on the lateral tubercles. The scutellum elongate-triangular, with thickened margins and narrowly rounded tip.

The elytra parallel, conjointly rounded at the apex. The luteous coloured basal half sub-opaque, strongly and densely punctured, with three faint longitudinal costae; the greenish-black coloured apical half velvety, quite differently and very minutely sculptured, showing a trace of the median costa only.

The femora are strongly, the tibiae finely punctured. The metasternum rather densely punctured, with a longitudinal smooth line on the middle. The 5th ventral segment sub-conical, finely punctured, broadly rounded at the apex.

The described specimen has been collected many years ago by Prof. Blume, probably in Java.

The species is remarkable for its parallel shape and opaque (apparently velvety) pronotum.

In the Entomological Collections of the Zoological Garden at Amsterdam, there is a female specimen of a *Pachyteria* from East Java (Mount Ardjoeno) presented to those collections by Mr. Scheepmaker, which corresponds pretty well with the description and figure of *Pachyteria dimidiata* Westw. ¹⁾ (nec Guérin ²⁾) stated as inhabiting

1) J. O. Westwood, *The Cabinet of Oriental Entomology*. (1848). p. 60; pl. 29, fig. 8.

2) A. Delessert, *Souvenirs d'un voyage dans l'Inde*. (1843). Hist. nat. p. 57; pl. 14, fig. 1.

Assam. The latter species is considered in the *Catalogus Coleopterorum* of Messrs. Gemminger and von Harold as a variety of *Pachyteria fasciata* Fabr., although the elytra, which are conjointly rounded posteriorly in *fasciata*, are described and figured as having the outer apical angle dentated.

I propose to call this Ardjoeno-species

Pachyteria Scheepmakeri, sp. n. ♀.

It may be distinguished from *P. fasciata* Fabr. by its somewhat different coloration, the upper surface being black, with a slight metallic hue near and on the scutellum only, the 6th joint and the apical half of the apical joint of the antennae not being black but of the same luteous color of the 7th and following joints, and the fascia on the elytra being broader and of a more luteous color; by the black velvety pubescence on the pronotum and on the head between the antennae and on the vertex; by the different sculpture of the anterior half of the clypeus which is not longitudinally grooved but slightly emarginated on the middle of the front margin; by the thicker and shorter 3rd, 4th and 5th joints of the antennae; by the comparatively longer prothorax and finer lateral thoracical spines; by the punctuation of the luteous fascia of the elytra, which is finer and more densely set; by the narrowly emarginated apex of the elytra, and by the lateral transverse patches of silvery pubescence on the ventral segments of the abdomen. The apical (5th) ventral segment is broadly rounded posteriorly.

Leyden Museum, November 1880.

NOTE XI.

DESCRIPTION OF A NEW SPECIES OF THE LONGI-CORN GENUS MELANAUSTER, THOMS.

BY

C. RITSEMA Cz.

Melanauster Medenbachii, sp. n. ♀.

Length 36—40 mm. — Black, with steel-blue elytra; body and legs covered with a grey pubescence, which is interrupted on the elytra so as to form four transverse regular bands; moreover the space between the eyes and mandibles, the hinder portion of the pronotum and the shoulders and extreme base of the elytra are naked; the antennae ringed with a grey pubescence on the base of the 3rd and following joints.

The head and the prothorax very sparingly punctured, the former provided with a smooth line extending from the anterior margin of the clypeus up to the prothorax, the latter with three transverse grooves, one anteriorly, the two others near the base and preceded by a post-median rather indistinct tubercle. The lateral thoracical spines straight, strong and acute. The scutellum broadly rounded at the apex.

The base of the elytra is provided with granules, which are gradually replaced by punctures becoming less and less marked towards the apex; the granules are very rare near the scutellum, but very densely set and large on the shoul-

ders which are distinctly prominent; moreover the granules form two longitudinal rows, a very short one between the scutellum and the shoulders, and another which reaches the hinder margin of the first naked band on the inside of the shoulders.

The under surface and legs finely punctured.

A single specimen of which the habitat is unknown was presented to the Museum by the late Mr. A. B. van Medenbach de Rooy. I therefore attach his name to the species. Another female example is in the Collections of the Amsterdam Zoological Garden, and of this specimen the locality is likewise unknown.

Leyden Museum, December 1880.

NOTE XII.

ON CERTAIN TORTOISES IN THE COLLECTIONS
OF THE LEYDEN MUSEUM.

BY

Dr. A. A. W. HUBRECHT.

Günther's splendid monograph on the gigantic landtortoises, which appeared a few years ago, induced me to compare the specimens belonging to this group, which form part of the Leyden collections. Among these is the original specimen of *Testudo indica vosmaeri* Schoepff as it was first described and figured by this author in 1792 in his *Historia Testudinorum* (page 103, Pl. 22). Fitzinger, Duméril & Bibron and others have since introduced this species into science under the name of *Testudo vosmaeri*, without however being able to decide anything with certainty as to the locality where the species was to be sought for. Other authors such as Schlegel and Gray united all the gigantic landtortoises into one species to which the name of *Testudo indica* was applied: for them *T. vosmaeri* was a mere synonym.

Günther was the first to clear up the confusion with the aid of extensive material collected both in the Indian ocean and on the Galapagos islands. He succeeded in definitely settling that *T. vosmaeri* was a distinct species, which in former centuries had inhabited the island of Rodriguez, where however it had become exterminated in the beginning of this century. The species never occurred any-

where else but in this isolated spot, and the only remnants of it which, according to Günther, are preserved for posterity are two carapaces in the Paris Museum (from which Duméril & Bibron took their description after having identified them with Schoepff's figure) and five partially mutilated carapaces, together with numerous parts of the endoskeleton of a great number of individuals, now forming part of the collections in the British Museum, which have been collected by the naturalist of the Expedition for the observation of the Transit of Venus, stationed in 1876 on Rodriguez.

Günther incidentally mentions Schoepff's specimen which in the former century formed part of the collections of the Prince of Orange, stadtholder of the United Republic, which at that time were under the care of A. Vosmaer who gave a description of the specimen to Schoepff, adding that it had come from the Cape of good Hope. Günther rightly concludes that this specimen must have reached Europe at the time when the species was not yet extinct but does not mention where this type specimen may be looked for, apparently not being aware of the fact that Schlegel in the „Reptiles” of the »Fauna Japonica” (p. 74) draws attention to the very specimen, which together with numerous other objects had passed from the stadtholders' collections into those of the Leyden Museum.

There can be no doubt that this specimen is really the one from which Vosmaer's description and Schoepff's figure were taken. Not only do the measures correspond (length of the carapace in straight line 81 cm.; the same over the curve 93 cm.; width of the same over curve $88\frac{1}{2}$ cm.; length of the sternum 58 cm.); but the figure is a direct copy from the original, as is still more conclusively shown by the particular circumstance of the remnants of the sacral vertebrae, which were not entirely removed when the carapace was first prepared, being exactly reproduced in Schoepff's figure, such as they are there now.

The carapace is larger than either the Paris or the Lon-

don ones and extremely well preserved, never having been exposed to the deteriorating influence of climate as has been the case with the carapaces brought home by the Transit-of-Venus-expedition. The concentric striae on the scutes are very distinct, especially towards their margins; the anterior and posterior margins of the shell are somewhat upturned, though perhaps not quite so strongly as might be concluded from Schoepff's figure. The sternum is concave and so the carapace has in all probability belonged to a male individual. That it came from the Cape must be explained for in the same way as must so often be done for the other gigantic Testudinata, viz. that it had first been imported into that country from its original habitat Rodriguez, without any special importance having been attached to this latter fact.

The other gigantic landtortoises are very scantily represented in the Leyden Museum, which is deficient in all the species from the Galapagos islands.

There are four specimens of *Testudo elephantina*, one stuffed carapace, and three other carapaces with complete skeletons. Their respective sizes are

	A	B	C	D
Length over curve	85	64 $\frac{1}{2}$	79 $\frac{1}{2}$	57 $\frac{1}{2}$
Width » »	82	64 $\frac{1}{2}$	81	60
Length of sternum	52	43	49	38

I have moreover compared the skeletons with Günther's detailed description, with which they correspond in every respect.

Finally our spirit collections contain a young specimen, which will have to be referred to *Testudo gigantea* D. & B., a species not personally examined by Günther and having a general resemblance to *Testudo elephantina*, from which it is however distinguished by the caudal plate being divided in the middle.

After the Paris specimen this would be the second on

record. The division of the caudal plate is too regular to be looked upon as purely accidental.

The locality from whence the specimen was brought is sharply fixed. Dussumier himself on his travels in the tropics collected it in the island of Aldabra (N.W. of Madagascar) the chief dwelling place of the closely allied *Testudo elephantina*.

A careful investigation of the tortoises still inhabiting this group of small islands is however necessary definitely to settle the question whether really two distinct species of gigantic tortoises inhabit it or whether *T. elephantina* and *gigantea* are merely varieties of the same species. The young specimen in the Leyden Museum does not suffice to make out whether any other corresponding difference either in the endo- or exoskeleton really justifies us in looking upon the two specimens of *T. gigantea*, which are as yet on record, as specifically different from *Testudo elephantina*, both having in that case developed into distinct species by the fact of their being possibly isolated on two different islands of the Aldabra group.

The following enumeration of oriental Emydæ, represented in the collections of the Leyden Museum, may here be inserted because several authors still appear to retain doubts as to the specific independence of some of them, whereas at the same time the localities from whence they were brought may be worth recording. One of them was noticed and figured by Giebel, who however failed to recognize it as a distinct species, uniting it with *Clemmys dentata*. It is here described under the name of that naturalist.

Cyclemys oldhami.

One adult stuffed specimen from Burma.

Cyclemys dhor.

Five adult stuffed specimens, four of them from Java, one from the Malayan Peninsula; one young and two very

young specimens from Java in spirits, another very young one in spirits from Sumatra. In the latter island *C. dhor* appears to be much less numerous than *C. ovata*.

***Cyclemys ovata*.**

Two adult specimens from W. Sumatra, stuffed; one nearly adult, one very young and four young specimens in spirits from the same locality. Gray was the first to distinguish this species from the foregoing. In addition to the characteristics mentioned by him (Suppl. to the catal. of shield reptiles p. 28, 29), it may generally be distinguished from *C. dhor* by the black radiating lines on the sternal plates being much broader and more conspicuous. Moreover the anterior borders of the two anal plates meet in the median line of the sternum under an angle which is much less acute than that which they form in *C. dhor*. In numerous specimens of *C. ovata* these anterior borders even merge into each other by a very gentle curve.

Gray's specimens were from Borneo.

Appended to *C. ovata* Gray mentions the tortoise from Banka described by Giebel (Zeitschr. f. d. ges. Naturwissensch. 1866, p. 15) under the name of *Cl. dentata* as requiring further elucidation.

As the Leyden Museum possesses a specimen which was brought from Borneo by Schwaner in 1844 and which exactly corresponds to Giebel's description I may here be allowed to redescribe the species under the name of

***Cyclemys giebelii* n. sp.**

Shell rather depressed, serrated both anteriorly and posteriorly, the posterior serrature being very strong, as in young specimens of *C. dhor*. A continuous ridge along the median line of the back, the sides of the shell sloping downwards very evenly on both sides of the ridge, which has not the appearance of a raised keel. Nuchal plate rather large, triangular, broadly truncated in front. Mar-

ginal plates twelve on each side. There are *seven* vertebral plates; the fifth and sixth smallest and regularly trapezoidal, broader than long. The areola of each of the costal plates has a distinct brown spot; of the vertebral plates the four anterior ones have each a pair of similar brown spots just before the posterior border of the scale, one on each side of the vertebral ridge.

Paralel longitudinal yellow lines on the neck; a much broader longitudinal yellow patch commences above the eye and runs along the margin of the upper surface of the head. The front margin of the gular plates more or less denticulated having three prominences on each side. Length of the carapace over the curve $7\frac{1}{2}$ cm.

Habit. Borneo.

The four specimens of this species, which Giebel received from Banka, were all characterized by one or more supernumerary vertebral shields, but some of them were remarkably assymetrical. Our specimen is very symmetrically built and best corresponds with Giebel's upper figure, only the caudal plates are less prominent and more correspondent in shape with the adjacent marginals.

Geoemyda spinosa.

One adult stuffed specimen from Poeloe Tello on the Batou islands, W. of Sumatra; another adult in spirits from W. Sumatra.

Geoemyda depressa.

This species which was first described by Anderson from Arracan (Ann. & Mag. of Nat. Hist. 1875; vol. XVI. p. 384) appears to inhabit Sumatra as well. So at least would I conclude from an adult stuffed example preserved in the Leyden Museum which, as far as Anderson's diagnosis goes, appears to be identical with his species. The second, third and fourth vertebral offer a nearly flat surface, each of them being about twice as broad as long. The length of the shell over the curve is 22.5 cm. The claws are stronger than in *G. spinosa*.

The specimen was captured in a river in the hilly district near Padang by S. Müller and has been confounded in our collections with specimens of *Notochelys platynota*.

Batagur borneensis.

As might be presumed from the remarks made upon this species by its authors, Schlegel and Müller, when they described it (*Verhandelingen over de Nat. Gesch.*; *Schildpadden*, p. 30) under the name of *Emys borneensis* and found close relationship to *Tetraonyx longicollis*, this species is a true *Batagur*. The closer specific affinities however lead more towards the *dhongoka*, than they do towards the *baska*.

Still it appears that the Bornean specimens really belong to a distinct species, differing in certain constant characters from the Indian Batagurs. For this reason the following redescription may not prove superfluous.

Form of the shell rather convex, its hind edge slightly serrated in young specimens, the serrature becoming nearly obsolete with age. A continuous keel along the middle of the vertebrals in young specimens, which is reduced to knobs on the posterior half of the vertebrals in old ones. Sternum flat with very distinct lateral keels in young specimens. Nuchal plate triangular, broadest behind. The first, second and third vertebrals broader than long in young, but longer than broad in old individuals. *Gulars considerably broader than long, the suture between them being about one third of the length of the suture between the postgulars.* The hind margins of the postgulars form an obtuse angle in young and a faint curve in old examples. In an adult example the postgulars are shorter than either the pectorals, abdominals or praeanales, the sternum is of a more or less uniform yellow, on the back there are three broad longitudinal dark bands, whereas the marginals are provided with a black blotch near the anterior margin and situated partly on the superior, partly on the inferior surface of the animal.

In a young specimen the black bands on the back are much less distinct, whereas each of the sternal plates carries a large dark blotch closer to the posterior than to the anterior margin, each of these blotches being surrounded by a thin blackish line.

The Leyden Museum is at present in possession of two specimens of this species, one adult, the carapace of which measures 30.5 cm. over the curve, one young individual of about 12 cm.

Emys subtrijuga.

Synon. *Geoclemys macrocephala*, Gray, P. Z. S. 1849, p. 478. pl. 21; 1861, p. 139; 1869, p. 194.

Damonia macrocephala, Gray, Suppl. to the Cat. of Sh. Rept. 1870.

Emys macrocephala, Günther, Rept. of Br. India. p. 31.

With respect to this species considerable confusion has persisted up to the present day, which by the following lines I hope to be able to clear away.

The three original specimens on which it was founded and which are now before me, were captured in Java by Kuhl & v. Hasselt, most probably in the most western province of Bantam. They reached the Leyden Museum, were examined by Boie, who in his MS. list of the Malayan reptiles identified them with *Emys trijuga* Schweigger, from the continent of India. In 1835 Schlegel gave a short description of the specimens in the Fauna Japonica (Reptilia, p. 64) in which all the most salient characters: the large head, the yellow bordering of the shell and the curious distribution of colours on the sides of the head are distinctly enumerated. However he fell into Boie's error by bringing the specimens to Schweigger's *E. trijuga*. This error was corrected in the: Verhandelingen over de Natuurlijke Geschiedenis der Nederlandsche Overzeesche bezittingen, Leiden 1839—1844, on p. 30 of the part Reptilia, published by Sal. Müller and himself. Here the name *E. subtrijuga* was first given to the three Javan specimens, the large size of the head was again

noticed and for a fuller description reference was given to the Fauna japonica. Since then specimens of this species have never reached Leyden nor was the province of Bantam in the same time ever reexplored.

On the other hand the species was found to inhabit Siam, two specimens being sent from thence by M. Mouhot to the British Museum where they were described by Gray (who failed to detect their identity with Schlegel and Müller's *Emys subtrijuga*) under the name of *Geoclemys macrocephala*. Both his description and figure (Proc. Zool. Soc. 1859) agree, even in minute detail, with the three original specimens from Java and with their description in the Fauna Japonica. Other specimens were afterwards noticed from Cambodja (P.Z.S. 1861) and in 1869 *Geoclemys macrocephala* was placed by Gray in his genus *Damonia*. In the Supplement to the Catalogue of Shield-reptiles, published in 1870, it again appears under this name and amongst the synonymy a specimen is mentioned which was received from the Utrecht Museum as *E. trijuga*.

The latter is perhaps the same specimen which Günther mentions on p. 30 of his Reptiles of British India as having come from Holland under the name of *E. subtrijuga*. Günther remarked that this latter specimen was specifically distinct from *E. trijuga* but failed to recognize its identity with *E. macrocephala* with which Gray in 1870 united what appears to have been the same specimen. Leaving it at present undecided whether this was really an *E. subtrijuga* Schl. & M. — the type specimens being all preserved in Leyden it could not have been one of these — it appears to have rather augmented the confusion than otherwise. Still after the above recapitulation and the comparison of the three typical examples doubts can no longer be entertained as to the identity of *Emys subtrijuga* Schl. & M. with *Geoclemys (Damonia) macrocephala* Gray. It is certainly curious that the distribution should be such as to make an animal from Siam reappear in Java, being apparently absent in the interve-

ning countries, but it must be remembered that this is the case with other animals both amongst birds and mammals as well.

Strauch in his zoogeographical monograph »die Vertheilung der Schildkröten über den Erdball», Petersburg 1865, briefly notices Gray's *Geoclemys macrocephala* as coming from Siam and Cambodja (p. 66) but was not aware of the identity with *E. subtrijuga* above referred to, nor did he notice that *E. subtrijuga* Schlegel & Müller, which was not circumstantially characterized when the species was first introduced under this name in the »Verhandelingen etc.", had formerly been described more elaborately in the Fauna Japonica.

NOTE XIII.

ON A NEW GENUS AND SPECIES OF AGAMIDÆ
FROM SUMATRA.

BY

Dr. A. A. W. HUBRECHT.***Phoxophrys* n. gen. ¹⁾.**

Tympanum hidden. No femoral pores. Back and sides covered with small smooth scales, intermixed with larger keeled ones and with very large, multicarinate conical tubercles. No dorsal crest. A row of longer erect scales above the eye. Upper surface of the head covered with conical tubercles.

Phoxophrys tuberculata n. sp.

Head tetrahedral with a sharp canthus rostralis; above the eye the scales of the canthus become large and erect, giving rise to a sort of horn-like appendage, more than half as high as the diameter of the eye. The head is covered with tubercular scales and carinate tubercles, the interorbital space is deeply concave. At the back of the head a row of scales larger than the surrounding ones forms a transverse bridge between the posterior borders of the eyes, at the same time limiting the interorbital concavity from behind. Ten upper labial shields and as many lower labials. Larger multicarinate tubercles behind the eye and at

1) Φαξός, pointed; ἄφρος, eyebrow.

the angle of the mouth; throat covered with sharply carinated keels; no gular appendage.

The small imbricate scales on the sides have their free margins turned upwards. Of the larger, multicarinate tubercles on the back, three or four on each side of the median line are more especially prominent. The scales on the belly are larger than those on the sides and strongly keeled. Strongly keeled scales on the limbs, which on the upper surface are intermixed with larger tubercular multicarinate ones.

Tail much longer than the body; all its scales keeled; those on the inferior surface the largest. The hind limb laid forwards extends to the angle of the mouth, the fore limb laid backwards does not reach to the thigh.

The colour of the specimen, which has been in spirit for many years cannot be determined. It was collected at Batang Singalang in W. Sumatra by Sal. Müller and measures 4.3 cm. without the tail.¹⁾

1) The specimen will be figured in Part II, Vol. IV of „Midden Sumatra” which is now in the press, being published by Messrs. E. J. Brill at Leyden.

7209 ~~Vol.~~ May 16. 1881

NOTES

FROM THE

LEYDEN MUSEUM

EDITED

BY

Prof. H. SCHLEGEL

Director of the Museum.

VOL. III.

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N<sup>o</sup>. 2. April 1881.  
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Sm LEYDEN

E. J. BRILL.

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NOTE XIV.

ON THE ZOOLOGICAL RESEARCHES IN
WEST AFRICA.

DIRECTED BY

H. SCHLEGEL.**I.**

January 1881.

It has always been my opinion that the true science of zoology is entirely based upon an exact and detailed knowledge of those types in nature to which we are in the habit of applying the term *species* and *conspicies* and upon our acquaintance both with the constant varieties and with the individual variations of the species. Indeed the science of zoology lays claim to its full dignity only when it is considered as a subdivision of the immense domain of physical geography.

These considerations naturally lead to the conclusion that zoological science can only be thoroughly studied in those central collections which contain the greatest possible number of species. Each of these species must there be represented by complete series of perfect specimens, illustrative of all the different phenomena consequent upon difference in age or sex of the individuals, upon difference in season, locality, variety, variation, etc. ¹⁾

1) The term "series" in the sense which I give to the word must not be confounded with mere accumulations of specimens, bearing none of the characters above mentioned.

To obtain these no time must be lost; many species of animals are daily diminishing in number, especially by the influence of man, and will sooner or later become entirely extinct, whereas others are reduced to a small community which often emigrates to the untrodden wilds of the interior, from whence it is very difficult to obtain them. Not only are they rarely captured but their transport to the nearest harbour often is very troublesome and expensive, nay, very often impracticable. And so it becomes a duty to naturalists to try and secure specimens of those types that are for ever disappearing from the surface of the earth. Then at least they will have the satisfaction to be able to show and to study be it only the dead relics of a creation, the harmony of which has already been disturbed in manifold ways by the thoughtless tyranny of man himself. It has even now become difficult to recognize the original plan of creation in its full extent. 1)

Being myself occupied since many years with the foundation and gradual development of an establishment answering to the above definition, at the same time the central Museum for the kingdom of the Netherlands, I started from the principle that such an institution would be greatly benefited and gradually claim superiority over the greater number of existing zoological Musea, if its collections could be enriched by the results of very thorough researches made in certain more or less restricted localities by men of sufficient scientific training and during a period which should be long enough for a thorough exploration and for the collecting of numerous specimens of every species.

The liberal way in which the Government of the Ne-

1) It is hardly necessary to remind that these observations have a special bearing upon the mammals and birds, which in consequence of their higher organisation are placed at the head of creation and must occupy the first rank in Musea. Their capture requires the greatest expense, their preservation and study perfect knowledge.

therlands has hitherto supported this system of zoological explorations is universally known. However, it was only carried out with considerable interruptions, which are a great impediment to the successful application of the system. In order to avoid these I formed the project of organizing, for the benefit of the Museum, a private expedition which was to explore in the way above indicated, different parts of Western Africa. A few years ago Dr. F. Pollen had set the example by his zoological explorations in Madagascar.

The members of the present expedition are J. Büttikofer and C. Sala. The former, who was my assistant at the Museum, offered to be the scientific leader of the expedition for which he possesses all the capacities required; the second an experienced traveller, who passed a number of years in Java and Angola is at the same time an accomplished sportsman and collector.

The equipment of the expedition was carefully superintended by myself. A long experience gained by the numerous expeditions which I have seen depart from our Museum in the course of this century has taught me to arrange this in a way which proves to be most convenient to the travellers. They were moreover furnished by Government with ample recommendations to the different consuls and shipped in November 1879 for Liberia in a vessel belonging to the Rotterdam firm of Hendrik Muller and Son. The facilities granted to the expedition by this gentleman, as well as his recommendations to his different agents proved to be of the greatest service. Thanks to the cares of Consul Modderman and Vice Consul Wiegmann the travellers were able to make excursions both into the interior and along the coast. Through the kind intercession of these gentlemen the Liberian Government exempted them from paying duty upon the implements imported; here as in the United States of North America science appears to take its place at the head of man's occupations. The members of the Liberian cabinet showed

great interest in the expedition and provided our travellers with new recommendations, whereas from Mr. Anderson who has made several voyages throughout Liberia and the neighbouring countries and published a report upon these, they obtained much valuable information.

After a short sojourn at Monrovia our travellers proceeded upon their journey, following the Mensurado River in a canoe as far as the creek which unites it to the St. Pauls River, and then following the latter river till they had reached their first station at the rapids, which are situated no more than one third of a degree from its mouth. Here they were very kindly received by the reverend Mr. Day and his lady, an English missionary stationed at Millsburg, whose interest in the expedition proved to be of invaluable service during the whole time the travellers stopped on the banks of the St. Paul.

From Millsburg they proceeded to Bavia, four hours' march higher up the banks of the river and after a short stay, continuing along the right bank of the St. Paul, they reached Soforé after a full day's march.

From this point numerous and distant excursions were made in all directions, in a primeval forest region only traversed by narrow footpaths. Though neither suffering much from fever nor from mosquitoes the rainy season ruled during the whole summer with such uncommon force and perseverance that collections could hardly be formed under such circumstances. Undoubtedly this would have decided them to leave the place as soon as possible but for the astute cunning of the natives who refused to procure them either food or carriers, thus retaining them in a sort of captivity in order to be better able to rob the travellers of anything they could lay hold of during the time the latter were out on their shooting excursions.

At last they were fortunately delivered out of this untenable position by the efficient measures of Mr. Day and so could return to Monrovia from whence they have sent a first consignment of natural history collections to Europe.

Notwithstanding all these unfavourable circumstances the collections contain several valuable and interesting objects. I shall not enumerate all but merely mention some of the more interesting or rare species.

Amongst the mammals I hailed with satisfaction three beautiful specimens of the true *Colobus ursinus*, exactly similar to the specimen from Sierra Leone figured by Fraser. It is now definitely proved by these specimens that *Colobus ursinus* differs constantly from *Colobus vellerosus*, which inhabits the Gold Coast, thus corroborating my statements about these two species in the «Monographie des Singes» which I published a few years ago. Another interesting curiosity of the collection is a young but very beautiful specimen of *Cephalophus doria*, together with the head of a somewhat older female of the same species. New to science are a species of squirrel (*Sciurus salae* Jentink *vide infra*) and a genus of Pteropi without claws on the index fingers (*Leiponyx büttikoferi* Jentink). The travellers met with only one specimen of *Hippopotamus liberiensis*, which however had been caught by the negroes and had been cut into pieces before their arrival. *Hyaemoschus aquaticus* although spread over the woods could not be captured; *Potamogale* appears to be entirely unknown in the country.

Of the birds the following present more particular interest. *Agapornis swinderiana* occurs in small numbers and lives in the crown of the trees. *Psittacus timneh* is the only larger parrot in the country, representing without exception the common species *Psittacus erythacus*. A single female specimen of a true sparrow-hawk which shows exactly the same character as the male (type of *Nisus erythropus* of the Leyden Museum) proves that this species constantly differs from *Nisus minullus*. Only one specimen was procured of *Columba uncinata* Cassin, the type of which was captured by du Chaillu on the Ogoway and is now in the Philadelphia Museum. Of the beautiful *Columba iriditorques* Cassin, also discovered by du Chaillu there are only a few specimens. Of the genus *Centropus*

one specimen was secured, which belongs to the rare species *Centropus francisci*. A fine series of the small *Gla-reola nuchalis* was collected, which up to the present day was only known from a single specimen killed on the banks of the Upper Nile. However all the specimens collected in Liberia have a rufous instead of a white collar, for which reason I shall designate them by the name of *Gla-reola nuchalis liberiae*. Eight species of Hornbills inhabit the country, and among them are the two rare and interesting species which I have formerly described as *Buceros pulchrirostris* and *B. nagtglasii*. A fine series of *Buceros semifasciatus* furnishes the ultimate proof that this species cannot be confounded with *Buceros fasciatus*, as has been proposed by certain modern ornithologists.

The present note is intended to serve as an introduction to the description of the new or interesting animals for which we are already indebted to our collectors.

An extract of Mr. Büttikofer's Journal of this first year's work in Liberia will be published in the Journal entitled "Tijdschrift van het Aardrijkskundig Genootschap te Amsterdam."

The duplicates in the collections both of the mammals, birds and some of the other classes of animals have been exclusively intrusted for sale to the well-known firm of Mr. W. Schlüter at Halle.

H. SCHLEGEL.

NOTE XV.

DESCRIPTION OF A NEW AFRICAN BAT,
LEIPONYX BÜTTIKOFERI.

BY

Dr. F. A. JENTINK.

January 1881.

In the family of the *Pteropodidae* there are three genera in which the claw to the index finger is wanting, viz. *Cephalotes*, *Notopteris* and *Eonycteris*. The first of these genera is represented by two, the others each by a single species. They are distributed in the following manner: *Cephalotes peronii* inhabits the islands of the Austro-Malayan subregion, while *Cephalotes minor* is to be found in New Guinea; *Notopteris macdonaldii* is limited to the Fiji-group and Aneiteum-island and *Eonycteris spelaea* is to be found in caves on the Indian continent (Burma). The *Pteropodidae* met with by the numerous travellers in the African continent belong without exception to the genera *Epomophorus* and *Cynonycteris*. Taking these facts into consideration I was greatly surprised to find in a small collection of bats, made in Liberia by our travellers Büttikofer and Sala a *Pteropus*-like bat, which did not possess a claw to the index finger and so could not belong to a species of *Epomophorus* or *Cynonycteris*. This species differing in many points from the other species without a claw to the index finger, I am obliged to regard our specimen as the type-species of a new genus, which I propose to call

Leiponyx, n. g.

Muzzle as in *Pteropus*. Nostrils slightly projecting, rather deeply emarginate between. Upper lip with a distinct vertical groove in front.

Index finger without a claw. Metacarpal bone of the middle finger smaller than the index finger. Wings from the sides of the back and from the base of the first toe. Tail short, for its greater part free from the membrane.

Dentition. Inc. $\frac{2-2}{4}$, c. $\frac{1-1}{1-1}$, p.m. $\frac{2-2}{3-3}$, m. $\frac{2-2}{3-3} = 32$.

Leiponyx büttikoferi, n. sp.

Ear longer than the muzzle (the distance between the tip of the nose to the foremost corner of the eye). Ear-conch with a rounded tip, the outer margin in its upper part concave, convex further on, inner margin slightly curved. Shoulder-glands absent in the female, the single specimen we possess.

The palate-ridges are seven in number; the first four are undivided; the first is nearly straight and placed between the canines, the second is slightly curved and placed immediately behind the first premolars, the third ridge is broader than the second and unites the second premolars; the fourth again is more arched and unites the space between the two molars on each side. The three remaining ridges form oval elevations on each side resembling those in *Epomophorus comptus*. They are succeeded by ill-defined semicircular toothed lines similar to the same parts in *Epomophorus franqueti*.

The four unicuspidate upper incisors are placed at a distance from the canines, in pairs, with a rather wide space between those pairs. The foremost incisors are the smallest. The lower incisors are also unicuspidate and nearly equal in

size and placed in a semicircular row between the smooth canines. The canines in the upper and lower jaw are followed at a small distance by the little developed first premolars, which are separated from the much stouter second premolars by a rather large interval. The third premolar in the lower jaw is separated by a space nearly as large as the interval between first and second premolar. This is the most developed premolar, not in vertical extent but in circumference. Molars very small, slightly raised above the level of the gum, especially the lower molars.

Fur short, yellowish brown, darker on the head. Ears and wings blackish brown. Claws black, strongly arched and acutely pointed.

Measures of the single specimen.

	m m.
Head and body	195.
Tail	13.
Tail free from membrane	7.5
Ear	25.
Thumb with claw	46.
Forearm.	125.
Index finger	85.
Third finger, metacarp.	82.
» » 1 st phalanx.	50.
» » 2 nd phalanx.	89.
Fourth finger, metacarp	82.
» » 1 st phalanx	43.
» » 2 nd phalanx	52.
Fifth finger, metacarp	78.
» » 1 st phalanx	33.
» » 2 nd phalanx.	33.
Tibia.	52.
Foot with claw	35.

Hab. Liberia, St. Paul's River (Millsburg).

Among the other bats, collected in Liberia by the above named travellers, I found about 30 specimens of *Vesperugo nanus* Peters. They were captured in the houses of the Negroes, hiding under the roofs. This capture is not without interest, for as far as I know this species had hitherto only been met with on the East Coast of Africa and in Madagascar. Two specimens in the collection belong to *Epomophorus franqueti*.

NOTE XVI.

ON A NEW SQUIRREL, SCIURUS SALAE.

BY

Dr. F. A. JENTINK.

January 1881.

This beautiful squirrel is one of the recent discoveries made in Liberia by our diligent travellers, Büttikofer and Sala. It is at once distinguished from the other hitherto described species found in Africa by a broad black band, running from the neck to the tail along the middle of the back and by its tail being black on the upper parts and not ringed as in nearly all the other African squirrels.

As the fur is *soft* to the touch it finds its place among the true *Sciuri*. In external appearance it agrees with the species of a group of which I would regard *Sc. rufobrachiatus* as the type, but it differs by presenting $\frac{5}{4}$ molars and not $\frac{4}{4}$. Moreover in *Sc. rufobrachiatus* and *maculatus* the upper incisors are longitudinally grooved and this is *not* the case in our new species.

Having thus pointed out the general differences between *Sc. salae* and the other known African Squirrels and having fixed the place it is to occupy amongst them I will now give a brief description.

Agrees in size with *Sciurus rufobrachiatus* and *maculatus*. Head and body above and below grizzled, each hair being black with one or two yellowish brown rings. Among these rings

there are a few broader ones on the middle of the belly and the inside of legs, those parts thus showing a browner hue. Outside of legs colored as the back, towards the-fore and hindfeet the hairs are shorter and towards the fingers the rings disappear, the fingers being nearly black throughout in some specimens. On the middle of the back from between the shoulders the ringed hairs are for the greater part substituted by longer and wholly black hairs, which form a broad black band along the spine. This black band continues on the upperparts of the tail down to the last caudal vertebra, the long tuft being nearly brownish throughout, in consequence of the very broad brownish rings to the hairs. Underparts of the tail present a grizzled aspect along the middle, broadly bordered with black.

Ears short, rounded, thickly covered with short black hairs, with a very small subterminal brownish ring.

Of five adult specimens, three males and two females now before me, four agree entirely with the description given above, and the fifth specimen differs by the dorsal band being more effaced and by the browner color of the underparts of the body.

Tail longer than head and body. Whiskers long, black.

Incisors not stout, with the foreside orange colored. They are not grooved. First upper molar more developed than is usually the case with this generally small tooth.

Measures of the largest specimen.

	mm.
Head and body	270.
Tail with tuft	390.
Tail without tuft	325.
Hind foot with claws	65.
Ear.	17.
Skull	58.
Width between jugalia	34.
Length upper molar series	11.
Distance between incisor and first upper molar . .	13.
" " " " " lower molar . .	7.

Hab. Liberia, St. Paul's River (Bavia and Soforé-Place.)

Mr. Büttikofer relates in his Journal that the natives distinguish this species very well, and give it the name »Bushcat'', saying that it is not a »Squirrel''. It lives in cavities of trees.

The other *Sciuri* sent over from Liberia belong to the following long known species, viz. *Sc. poensis* Smith, *leucostigma* Temm., *punctatus* Temm., *maculatus* Temm. and *temminckii*. *Sciurus temminckii* is the name I propose for the species, described by the late Temminck under the name *caniceps*: the latter name must be altered as in 1842 Gray shortly diagnosed a Squirrel from Bhotan under the name *Sciurus caniceps*. Gray's *caniceps* is prior to Temminck's *caniceps* which was described in 1853; I have taken this opportunity to rebaptize the latter in *Sc. temminckii*.

NOTE XVII.

ON A COLLECTION OF FISHES FROM THE
ST. PAUL'S RIVER, LIBERIA, WITH DESCRIPTION
OF THREE NEW SPECIES.

BY

Dr. A. A. W. HUBRECHT.

In Note XIV the object of the expedition of Messrs. Büttikofer and Sala to W. Africa has been traced by Prof. Schlegel and it may here suffice to repeat that during their first year's stay they principally explored the banks of the St. Paul's river in Liberia.

In this river the following freshwater fishes were collected :

Chromis mossambicus.

Of this species, with which Steindachner has been able to identify several nominal species, reducing the known African Chromides to two species: *C. niloticus* and *C. mossambicus*, seventeen specimens of different sizes were collected. They all range within the limits of variation fixed by Dr. Steindachner. The vernacular name is *Uo*, which is applied to *Hemichromis fasciatus* as well.

Accepting the conclusions of Steindachner above alluded to I have however to describe a new species which is different from both.

***Chromis buttikoferi* n. sp.**

The length of the head is contained three times and

two fifths in the total length (without caudal), the height of the body twice and one fourth. The teeth are more considerable in size and smaller in number than in either of the two species above mentioned, there being only ten teeth on each side in the upper and five in the lower jaw. From five to six series of scales on the cheek below the eye; thirty scales in a straight line from the opercle to the caudal; four longitudinal rows of scales above and ten below the lateral line. The fin-formula is $D. 15/15$; $A. 3/10-11$; the pectoral fin does not extend to the anal.

There are eight black transverse bands: the first across the eyes, fainter than the succeeding ones; the second across the nape and opercle, being continued on the belly before the pectorals; the third commences at the beginning of the spinous dorsal, runs behind the pectoral to the root of the ventral; the fourth, fifth and sixth from the dorsal fin to the belly, the fifth attaining the vent and the beginning of the anal, the sixth descending to the posterior half of the anal. Each of the four last-named bands has a width of from three to four scales, the light space between them is only one or two scales wide. The seventh and eighth transverse band occupy the free portion of the tail; the space between them is even smaller and sometimes they appear to coalesce. The root of the caudal fin and a transverse band across its extremity are light-coloured; the intervening surface is blackish. Bands four, five, six and seven are continued on the vertical fins: this is more conspicuous in young than in older individuals where the dark colour spreads over the whole of the fins. The pectorals are dark-coloured, the ventrals black with the outer elongated ray white.

The above description will suffice to show that the specimens in question are indeed specifically different both from *C. niloticus* and *C. mossambicus*, the two species to which Steindachner has reduced all those that were hitherto described from Africa. The pectoral fin never attains to the length which characterizes that of *C. niloticus*; the teeth

are of larger size and less in number than in either of the two other species referred to. The fin-formula is also constantly different; of the three specimens two have: $A. \frac{3}{11}$, one: $A. \frac{3}{10}$; all agree in having fifteen soft rays in the dorsal.

The transverse bands are also differently distributed: they are continued down to the inferior margin of the belly and never bend backwards in their dorsal half as I find they do in all the specimens of *C. mossambicus* I was able to examine. Moreover the distribution of colours on all the vertical fins appear to be different, as is the dark colour of the belly in front of the pectorals. Of even more importance is the large number of rows of scales under the eye; though generally five, I count six rows on one cheek of one of the specimens.

Gea is a vernacular name which together with *Uo* appears to be indifferently used for different species of *Chromis* and *Hemichromis*, also to the one here described.

Hemichromis fasciatus.

Ctenopoma petherici.

Three specimens. Vernacular name *Can*.

***Clarias salae* n. sp.**

This species differs from the other African representatives of the genus by the following constant characters. The dorsal fin has from 89 to 91 rays, the anal from 70 to 74, a larger number than is found in any of the other species. In old specimens the length of the head is contained six times and a half in the length of the body; in young ones five times and a half. The caudal fin is contained once and a half in the length of the head. The anal fin terminates just a little in front of the end of the dorsal. The extremity of the pectoral fin is separated from the beginning of the dorsal by an interspace equal to half its length. In adult specimens the upper surface of the

head is finely granular. The maxillary barbel, when not mutilated, reaches as far as the end of the pectoral, the nasal barbel as far as the posterior border of the occipital fontanel.

The colour in life is dark green with a small number of minute yellow dots placed in more or less regular transverse rows.

The vernacular name is *Soa*.

Malapterurus electricus.

This fish rarely exceeds one foot in length and is more common in the small creeks communicating with the St. Paul's river than in the river itself. About thirty specimens were collected; even of the small specimens the shocks can be very painfully felt.

Vernacular name: *Dobbo*.

Eutropius adansonii.

This species, the vernacular name of which is *Fada*, appears to be only caught at twilight.

***Eutropius liberiensis* n. sp.**

Closely allied to the foregoing species from which it differs both in the coloration and in the number of rays in the anal fin. Steindachner has fixed this number for *E. adansonii* at from 56 to 58, whereas in *E. liberiensis* there are only 50 rays. The formula for the dorsal and pectoral fins is D. $\frac{1}{5}$; P. $\frac{1}{10}$.

There are four dark longitudinal bands, one along the back, one above and one below the lateral line, the two latter only separated by a narrow silvery interspace, one from the pectoral to the caudal. The whole surface of the body is covered with minute dark dots which stand closer together along the dark longitudinal bands. There is a faint black blotch above the pectoral. The exterior border of the anal is not black as in *E. adansonii* but lighter than the inner half.

The adipose fin appears to be a little more developed than in *E. adansonii*.

Only one specimen of this species was captured: in a specimen of *E. adansonii* of about the same size there was no trace either of bands or punctuation.

Chrysichthys nigrodigitatus.

Vernacular name: *Poulet*.

Alestes macrolepidotus.

Vernacular name: *Fulu* or *Fru*.

Brachyalestes nurse.

Vernacular name: *Péré*, also applied to the following species.

Brachyalestes longipinnis.

Five specimens.

Hydrocyon forskalii.

Vernacular name: *Cuécess*.

Mormyrops deliciosus.

Vernacular name: *Babéré*.

Mormyrops henryi.

This species was hitherto only known from a description of Gill based upon a specimen in the Philadelphia Museum. He made it the type of a new genus *Isichthys*, which has afterwards been united with *Mormyrops* by Günther. The locality from whence this specimen had come could however no more be traced, although Gill states that he is disposed to believe that it was collected in Liberia (Proc. Ac. Nat. Sc. Philad. 1862, p. 444). This suggestion is now confirmed by the second specimen on record which has indeed been captured in the St Paul's river by our travellers.

Notopterus afer.

The groundcolour in life is dark green, the spots are yellowish.

Vernacular name: *Dada*.

The following fishes were collected in brackish water at the mouth of the Messurado river:

Pristipoma jubelini.***Gerres melanopterus.******Psettus schae.***

Four specimens of

Balistes maculatus

were captured in the Atlantic ocean as they were following in a shoal a log of driftwood and feeding upon the specimens of *Lepas* attached thereto.

NOTE XVIII.

DESCRIPTION OF A NEW SPECIES OF THE GENUS
CHELONARIUM FROM JAVA.

BY

E. REITTER.

Chelonarium conspersum, sp. n.

Elongato-ovalis, obscure piceum, tibiis tarsisque dilutioribus, dense subtiliter punctatum, pube grisea depressa maculatim conspersa sat dense vestitum; prothorace concavo, longitudine latiore, sub-semi-elliptico, lateribus reflexis, prope angulos posticos acutos leviter sinuato, margine basali fortissime punctato-crenata; scutello dense griseo piloso, subrotundato; elytris elongato-ovalis, stria suturali subimpressa, apice parum perspicua, carina humerali brevi, distincta; subtus dense griseo pubescens. — Long. 7 mm.

Of an elongate elliptical shape, slightly convex, blackish brown, closely and finely punctured all over, now and then appearing to be faintly rugose; the under surface densely covered with a yellowish grey pubescence; on the upper surface the pubescence is of a more bright grey color and more or less divided in patches. Tibiae and tarsi of a lighter color. Thorax broader than long, elliptically narrowed and rounded anteriorly, the lateral margins strongly upturned, the disk concave in consequence; just before the posterior angles the lateral margins are

faintly notched; the posterior margin is provided along its whole length with deep, slightly elongated pits, which make it appears strongly crenulated. Scutellum of a rounded triangular shape, as long as broad. Elytra elongate-ovate, close to the suture a vestige of a shortened line; the prominent portion of the shoulder forms a short fold having a keel-like appearance.

A single specimen from Batavia, West-Java (M. C. Piepers).

VIENNA, February 1881.

NOTE XIX.

TWO NEW SPECIES OF COLEOPTERA
COLLECTED DURING THE RECENT SCIENTIFIC
SUMATRA-EXPEDITION.

DESCRIBED BY

E. REITTER.1. *Prometopia rotundata*, sp. n.

Rotundata, leviter convexa, nitida, glabra, subtus fusca, antennis pedibusque ferrugineis, supra nigra, subtilissime dense punctulata, lateribus prothoracis elytrisque, his maculis magnis subrotundatis rubris, serie sublaterali punctorum fortiter insculptis. — Long. 3,5 mm.

Almost circular, slightly convex, upper surface glossy black, closely and very finely punctured, the prominent lateral margins of the thorax and elytra and moreover two large and roundish spots on each of the latter bloodred. Head with two faint impressions between the antennae. Thorax strongly narrowed towards the front margin, the anterior as well as the posterior angles acute, the anterior angles produced. Elytra nearly semicircular, and provided close to the slightly upturned lateral margins with a well-marked row of punctures, ceasing at a rather considerable distance from the apex.

This species may be easily distinguished from *Prometopia quadripunctata* Rtttr and *quadrimaculata* Motsch. by its circular shape.

Of this species one specimen was captured in May 1877 at Renkeang Loeloes, a second specimen in June at Silago, whereas a third was collected in October at Loeboekh gadang. The first of these specimens is now in the Leyden Museum, the second in the collection of Mr. Reitter, the third has unfortunately been lost on the way from Paris to Leyden together with two species of Histeridae, which Mr. de Marseul sent back to the Leyden Museum.

2. *Helichus elongatus*, sp. n.

Elongatus, subparallelus, minus convexus, obscure fuscus, confertim punctulatis, dense nigro-pubescentibus, tarsis ferrugineis; prothorace transverso, antice posticeque aequaliter angustato, elytris thorace latioribus, elongatis, subparallelis, striato-punctatis; oculis dense pubescentibus. — Long. 5—6 mm.

Similar in shape to an elongate *Parnus*, slightly convex, black or greyish black, the tarsi rusty-red. The upper surface very closely and finely punctured all over, covered with a black and dense tolerably long pubescence. The eyes pubescent. The thorax broader than long, narrower than the elytra, the sides slightly rounded in the middle, similarly narrowed anteriorly and posteriorly, the anterior as well as the posterior angles acute, the former slightly prominent. The scutellum large, triangular. The elytra elongate, conjointly rounded at the apex, the sides sub-parallel, the upper surface distinctly punctato-striate. The under surface covered with a shorter, more yellowish, dense and tomentose pubescence.

A single specimen was captured in April 1877 at Soepajang, whereas not less than seven specimens were captured in November of the same year at Moeara Laboe.

VIENNA, February 1881.

NOTE XX.

DESCRIPTION OF A NEW SPECIES OF THE
COLEOPTEROUS GENUS BOTHRIDERES, ERICHS.

BY

C. RITSEMA Cz.

Bothrideres Reitteri, sp. n.

Length 7,5 mm. — Glossy dark brown, the elytra, the under surface and femora somewhat paler.

The head finely punctured, provided with a longitudinal impression widening out towards the anterior margin which is straight. Eyes very prominent ovate and transverse. The pro-apical and apical joints of the antennae transverse, the latter densely covered with a short greyish pubescence.

The thorax wedge-shaped, truncate both before and behind; the anterior angles acute, slightly projecting, the sides convergent towards the base, distinctly rounded on the anterior half and notched at the basal angles, the notches preceded by a small blunt tooth. The disk sparingly covered with punctures which are much finer than those of the head; moreover it is deeply excised longitudinally; the excision not continued either to the front or the hinder margin, pedunculate, and provided at the bottom of the widest or anterior division with a slightly raised, well defined longitudinal patch. The scutellum of a regular triangular shape, with curvilinear sides.

Notes from the Leyden Museum, Vol. III.

The suture is accompanied on each elytron by a deeply impressed impunctate line. The elytra on the disk provided with longitudinal rows of punctures of which the first and second are slightly impressed, the second more strongly so towards the base, where moreover the punctures are confluent; exteriorly to the third row the punctures become less and less distinct; the exterior margin, which is bisinuated at the apex of the elytra, is accompanied by a deeply impressed impunctate line. The interstices are flat and sparingly covered with almost imperceptible punctures; the second interstice (we do not reckon the space between the suture and the sutural line as one) prolonged at the base into a slightly upturned tooth-like projection. The shoulders depressed, somewhat prominent and broadly rounded.

The under surface of the thorax and of the large first abdominal segment as well as the femora finely and sparingly punctured; the second and following ventral segments as well as the tibiae strongly punctured; the apical ventral segment transversely impressed, its hinder margin narrowly truncated.

The apical margin of the dilated apex of the tibiae serrato-dentate; the external side of the anterior tibiae armed on the middle with three coalesced teeth, that of the intermediate tibiae with about six coalesced teeth; the external side of the posterior tibiae unarmed.

A single specimen captured by Mr. J. C. van Hasselt at Boenga Maas, province of Palembang, Sumatra.

I have much pleasure in dedicating this species to Mr. E. Reitter of Vienna, the well known authority on the Nitidulidae and allied families.

Leyden Museum, January 1881.

NOTE XXI.

TWO NEW SPECIES OF THE COLEOPTEROUS GENUS
HELOTA, MAC LEAY.

DESCRIBED BY

C. RITSEMA Cz.1. *Helota ocellata*, sp. n.

Length 7,5 mm. — The head and mandibles, the upper surface of the prothorax, the scutellum, the elytra, the apex of the femora, and the tibiae and tarsi of a golden green with coppery tinges; the remaining portions as well as two raised oval spots on each elytron pale fulvous.

The head depressed, inconspicuously elevated in the middle, less produced anteriorly than in *Vigorsii* Mc Leay, *Servillei* Hope, *gemmata* Gorb. etc.; upper surface closely and finely punctured, the punctures on the middle of the space between the eyes larger.

The prothorax regularly convex, transverse, widest at the base which is deeply bisinuated and has the lateral angles acute and slightly divergent; the lateral margins crenulate, the anterior margin slightly emarginate, its lateral angles not produced; the upper surface covered with strong punctures with the exception of a longitudinal line on the middle of the basal half which is impunctate. The scutellum transverse, impunctate.

Each elytron is provided with ten regular striae of deeply

impressed punctures which are confluent in the stria which accompanies the lateral margin; the interstices, especially the second which is continued to the apex, are distinctly raised on the apical portion of the elytra which are subacute at their apex. The oval yellow spots are situated between the third and seventh striae.

The prosternum is finely punctured all over, the metasternum only on the sides. The middle of the metasternum as well as the fulvous portion of the femora and the under surface of the abdomen impunctate; the apex of the femora and the tibiae punctured.

A single specimen, of which the third and following joints of the antennae and the apical segment of the abdomen are lost.

Hab. Java (S. Müller).

2. *Helota semifulva*, sp. n. ♀.

Length 7,5 mm. — The upper surface of the head, the scutellum, the apical half of the elytra, and the knees of a metallic green color; the under surface of the head, the mandibles and the club of the antennae black; the tarsi dark brown; the remaining portions pale fulvous. Moreover the prothorax is narrowly margined with metallic green anteriorly and posteriorly, and with black laterally; the base of the elytra is also narrowly margined with black.

The head of the same shape as that of the foregoing species; its upper surface finely and rather remotely punctured.

The prothorax depressed, sub-transverse, the sides almost parallel and hardly rounded, not crenulate; the anterior margin distinctly emarginate, the lateral angles rounded and slightly produced; the base deeply bisinuate, the lateral angles acute and slightly bent inwards; the upper surface finely and not closely punctured, with an indistinct impression on the median lobe opposite to the scutellum. The latter transverse, impunctate.

The elytra depressed, with parallel sides and conjointly rounded apices. Each of them provided with ten longitudinal rows of impressed punctures; these punctures appear to be transverse on the fulvous portion. The interstices flat and covered with extremely fine punctures.

The under surface and legs impunctate, with the exception of the sides of the pro- and metasternum which are sparingly punctured. The apical segment of the abdomen entire.

A single specimen from Mount Ardjoeno, East Java (W. E. J. Hekmeyer).

Leyden Museum, January 1881.

NOTE XXII.

SYNONYMICAL REMARKS ABOUT CERTAIN COLEOPTERA AND A HETEROCEROUS LEPIDOPTERON.

BY

C. RITSEMA Cz.

Coleoptera.

1. *Eurytrachelus Lansbergei* Gestro (*Annali del Museo Civico di Storia Naturale di Genova*. vol. XVI (1881) p. 320, fig.) = var. max. of *Eurytrachelus curycephalus* Burmeister (*Handbuch der Entömologie*. vol. V (1847) p. 387. — Snellen van Vollenhoven, *Tijdschrift voor Entomologie*. vol. VIII (1865) p. 151, pl. 10, fig. 4. — Parry, *Transactions of the Entomological Society of London* for the year 1874. p. 371).

2. *Eurytrachelus coranus* Gestro (*l. c.* p. 321. fig.) = var. minor of *Eurytrachelus arfakianus* Lansberge (*Comptes-Rendus des Séances de la Soc. Entom. de Belgique*. ann. 1880. p. CXVIII).

3. *Gnaphaloryx aper* Gestro (*l. c.* p. 324, fig.) = *Gnaphaloryx sculptipennis* Parry (*Transactions of the Entomological Society of London*. 3rd ser. vol. II (1864) p. 52. — Westwood, *id.* for the year 1874. p. 362; pl. 3, fig. 6 and 6a).

Obs. Westwood's figure of the entire insect mentioned above is incorrect, and neither corresponds with the figure

of the magnified left side of the head, nor with the specimen in the collection of the Leyden Museum, from which collection Mr. Parry has received the specimen described by him and figured by Prof. Westwood¹).

Misled by Westwood's inexact figure Mr. Gestro believed his specimens to be specifically distinct from *Sculptipennis* Parry. The figure which Mr. Gestro gives of it but to which he attaches the name of *Gnaphaloryx aper* is exact.

4. *Pachyteria puncticollis* Ritsema (*Notes from the Leyden Museum*. vol. III (1881) p. 33) = *Pachyteria javana* H. W. Bates (*Cistula entomologica*. Part XXI (1879) p. 395).

5. *Eumithera viduata* Pascoe (*Proceedings of the Entomological Society of London* for the year 1868. p. XIII (*Thysia*); *Annals and Magazine of Natural History*. 4th ser. vol. IV (1869) p. 208 (*Thysia*), and 4th ser. vol. XV (1875) p. 65; pl. VIII, fig. 4 (*Eumithera*) = *Celosterna umbrosa* Thomson (*Systema Cerambycidae*. Diagnoses (1865) p. 552, n^o. 81 (*Celosterna*); *Revue et Magazine de Zoologie*. 3me sér. tom. VI (1878) p. 51, n^o. 66. Obs. (*Aristobia*).

6. Genus *Momisis* Pascoe (*Longicornia Malayana*. p. 361) = genus *Bacchisa* Pascoe (*l. c.* p. 342).

The former genus has been established on a female specimen, the latter on a male individual.

I am indebted for this and the following remark to Mr. J. W. van Lansberge.

7. *Bacchisa nigriventris* Ritsema (*Notes from the Leyden Museum*. vol. III (1881) p. 7, ♂; and p. 8, var. ♀) = *Momisis aegrota* Pascoe (*Longicornia Malayana*. (1864—69) p. 362; pl. XVI fig. 4 ♀).

1) Through the kindness of Mr. Parry I have been enabled to compare the type specimen with that of the Leyden Museum. I found them identical, but the type specimen of a somewhat minor development.

Lepidoptera.

8. *Gnophria? Ceramensis* Vollenhoven (*Tijdschrift voor Entomologie*. vol. XVI (1873) p. 246; pl. 12, fig. 1) = *Phalaena Tinea Entella* Cramer (*Uitlandsche Kapellen*. vol. III (1782) p. 27; pl. 208, fig. D. — Walker, *List of the Specimens of Lepidopterous Insects in the Collection of the British Museum*. Part. II. Lepidoptera Heterocera (1854) p. 495, n^o. 2: *Lithosia Entella*).

N. B. The figure in the *Tijdschrift voor Entomologie* is not quite correct, the black markings not showing the green tinge which they really possess.

Leyden Museum, February 1881.

NOTE XXIII.

THE SPECIES OF THE RHYNCHOPHOROUS
GENUS EUPHOLUS, GUÉR.

ENUMERATED BY

C. RITSEMA Cz.

In the first part of the eighth volume of the *Catalogus Coleopterorum* of Messrs. Gemminger and von Harold, published in 1871, nine species are enumerated as belonging to the above mentioned genus. One of these however, *Eupholus vilis* Voll. ¹⁾, does not belong to this but to the genus *Rhinoscapha* Montr. and is allied to *Rhinoscapha carinata* Pasc. ²⁾ and not to *Rhinoscapha insignis* Guér. ³⁾ as Mr. Kirsch ⁴⁾ states who probably had *Rh. Batjanensis* Voll. ⁵⁾ in view and not *Rh. vilis*.

In the same year (1871) a new species (*Bandanus*) and a variety of *Petitii* Guér. (*Salawattensis*) have been described by Mr. Snellen van Vollenhoven ⁶⁾, in 1875 three

1) In the description of this species (*Tijdschrift voor Entomologie*. vol. VII (1864) p. 168) a serious lapsus calami has to be corrected viz. „Dos de l'écusson” must be read „Dos du corselet.”

2) *Journal of the Linnean Society*. Zoology. vol. XII. p. 5 (1874).

3) *Revue Zoologique*. 1841. p. 125.

4) *Mittheilungen aus dem k. zool. Museum zu Dresden*. Heft II (1877) p. 147, footnote.

5) *Tijdschrift voor Entomologie* vol. VII (1864) p. 164.

6) *Tijdschrift voor Entomologie* vol. XIV. p. 102; pl. 4, fig. 2 and 3.

new species (*Amaliae*, *Beccarii* and *Bruynii*) and in 1876 one (*Bennettii*) by Mr. Gestro¹), in 1877 one (*Brownii*) by Mr. H. W. Bates²), one (*Quinque-fasciatus*) by Mr. Chevrolat³) and five (*Latreillei*, *Magnificus*, *Quadri-maculatus*, *Alternans* and *Admirandus*) by Mr. Kirsch⁴), and in 1880 two (*Arfaki* and *Celebesus*) by Mr. Chevrolat⁵), making a total number of *twenty-two* described species.

These species may be thus sectionized:

A. Elytra with naked transverse black bands.

Represented in the Leyden Museum
by specimens from:

1. *Schanherrii* Guér. Doreh, Andai and Buru.
var. *Salawattensis* Voll. . Salawatti (two type specimens).
2. *Petitii* Guér. Doreh, Waigioe, Misole, Salawatti, Aru Islands and Ceram.
3. *Aurifer* Voll. Ceram (the type specimen).
4. *Quinque-fasciatus* Chevrolat. } Aru Islands, Salawatti and
5. *Latreillei* Kirsch. } Misole.
6. *Magnificus* Kirsch. Mefoor, and two specimens of
a variety from Soëk (New
Guinea)⁶).
7. *Linnei* Thoms. Aru Islands.
8. *Bandanus* Voll. Banda Islands (six type specimens), and Aru Islands.

1) *Annali del Museo Civico di storia naturale di Genova*. vol. VII. p. 1004, with fig., and vol. VIII. p. 387, with fig.

2) *Proceedings of the Zoological Society of London*. p. 155; pl. 25, fig. 2.

3) *Annales de la Société Entomologique de France*. 5th. ser. vol. VII. p. 173; pl. 4, fig. 6.

4) *Mittheilungen aus dem k. zool. Museum zu Dresden*. Heft II. p. 148.

5) *Le Naturaliste*. N^o. 42. p. 333.

6) This variety differs from the typical *Magnificus* in the following points: the black sutural spot on the apical green region of the elytra is absent; the blue color of the 2nd and 4th bands of the elytra is replaced by a bluish green, and the black band across the base of the elytra is narrower except on the third interstice. In the smallest of the two specimens the second green band of the elytra is almost entirely obliterated and replaced by black.

9. *Chevrolatii* Guér. Aru Islands and New Guinea.
 10. *Geoffroyi* Guér. Doreh and Andai.
 (= *mirabilis* Boisd.)
 var. *intermedius* Rits.¹⁾ Northern Coast of New Guinea.
 11. *Tupinierii* Guér. Island of Djawur (bay of Geelvink, New Guinea).
 12. *Arfaki* Chevr. not represented.
 13. *Celebesus* Chevr. not represented.
 14. *Amaliae* Gestro not represented.
 15. *Browni* H. W. Bates. . not represented.

B. Elytra with naked longitudinal black bands or spots.

16. *Cuvierii* Guér. Doreh and Andai.
 17. *Quadri-maculatus* Kirsch. not represented.
 var. *jugatus* Rits.²⁾. . . Andai (a single specimen).

C. Elytra with naked longitudinal and transverse black bands.

18. *Alternans* Kirsch. not represented.
 19. *Beccarii* Gestro not represented.
 20. *Admirandus* Kirsch. . . not represented.
 21. *Bennettii* Gestro. Southern New Guinea (Gestro).

1) Of this variety, which is intermediate between *Eupholus Geoffroyi* Guér. and *Tupinierii* Guér., the Leyden Museum has received two specimens of different size from Mr. J. W. van Lansberge. They agree with the first-mentioned species in possessing a short naked transverse band, which in the variety is represented by a small transverse spot, on the middle of the second green or blue region of the elytra at a distance of two interstices from the suture, whereas they agree with the second in having the usual transverse black bands continued from the suture to the lateral margins.

2) The two longitudinal naked spots on each clytron are united with each other by the naked fifth interstice. Moreover the interstice which runs along the suture is devoid of scales, possibly from abrasion. In the description of the typical *Quadri-maculatus* no mention is made of the rounded, although prominent shoulders, by which the species may be distinguished at a glance from *Cuvierii*.

- D. Elytra covered all over with scales, without naked bands or spots.

22. *Bruynii* Gestro not represented.

Judging from the material which I have before me, three of these species must however be suppressed as being synonymous, viz:

Aurifer Voll. 1) (1864) = *Petitii* Guér. (1841).

Bandanus Voll. (1871) = *Linnei* Thoms. (1857).

Latreillei Kirsch (1877) = *Quinque-fasciatus* Chevr. (1877), whereas, as I believe, several others can only be considered as varieties.

So for example *Petitii* and *Quinque-fasciatus* (perhaps even *Magnificus*) may prove to be varieties of *Schænherrii*, *Tupinierii* (with its supposed varieties *Arfaki* and *Celebesus*) a variety of *Geoffroyi*, etc.

A serious study of the species of this genus which seem to be quite as variable as they are beautiful, may be recommended to an entomologist who has extensive series of the different species at his disposal.

Leyden Museum, February 1881.

1) The description and figure (*Tijdschrift voor Entomologie*. vol. VII. p. 167; pl. 12, fig. 3) are taken from an old and much abraded specimen of *Petitii*.

NOTE XXIV.

DESCRIPTION OF A NEW PSYCHID FROM JAVA.

BY

F. J. M. HEYLAERTS.

Acanthopsyche Ritsemae, sp. n. ♂.

Fuscus dense hirtus; capite antice flavo, postice fusco hirtus; antennis fuscis ad apicem bipectinatis, 30 articulatibus; pseudopalpis brevibus flavis; oculis magnis proeminentibusque; thorace, antice potius griseo-, fusco-, subtus tamen flavo-, hirtus; abdominis, praesertim 5 ultimis, segmentibus dorso nigricantibus alboque annulatis, subtus flavis. Pedibus flavis, dense hirtis, tarsisque nudis; tibiis anterioribus spina maxima, tibiam superante, adhaerente.

Alis anterioribus elongatis, hyalinis, ad basin tamen squamulis fuscis dense obtectis; alis posterioribus angustioribus, dense fusco-brunneo squamatis, cellula tamen 4, cellulis 5 et 6 partim, apicem versus, hyalinis. Fimbriis subnullis.

Alis anterioribus costis 11, posterioribus tamen costis 7. Cellularum discoidalium cellula intrusa nulla.

Expansio alarum: 32—36 mm.

Sine larvae involucrum; larva feminaque ignota.

Habitat: Insula Java, mons Ardjoeno.

Species a dom. W. E. J. Hekmeyer capta est.

This very beautiful species is easily distinguished from *Oiketicus Hübneri* Westw. and *Herrichii* Westw. which also have hyaline wings but belong to another genus and do not possess the large spine of the anterior tibiae. I found it among some species of Psychidae of the Leyden Museum.

The head is $\frac{2}{3}$ as broad as the upperside of the thorax. The eyes are very prominent. The front is covered with yellowish, the occiput with fulvous hairs. The *clypeus* is very distinct, and in the middle of the face two small tubercles are to be found. The mouth is covered by the short but large yellowish pseudopalps. The fulvous *antennae*, which are bipectinated up to the tip, consist of nearly thirty joints, the long pectinations gradually shortening towards the tip.

The thorax is $1\frac{1}{2}$ as long as broad; its foreside and the scapulae are greyish, the rest is fulvous; the underside is covered with orange-yellow hairs.

The abdomen is dark fulvous; the five last segments are blackish and show white rings. The underside is of the same colour as the thorax.

The legs are densely covered with long yellowish hairs, the tarsi are naked. The fore legs are long and thick, their *tibiae* are provided with a very strong spine; the hind ones have very long and slender tarsi, the terminal spurs of the hinder *tibiae* are short.

The fore wings are elongated, very narrow at the base. The front margin is twice as long as the hinder one. The external margin is $\frac{1}{4}$ shorter than the former. The *apex* is acute. They are altogether destitute of scales, except the costa, the basal parts of cell 11 and 10, of the discoidal cell, of cell 1*a* and 1*b*, and a broad stripe along the hinder margin. On the hyaline parts dispersed hairs are to be found. The veins are also brown-fulvous.

The hind wings are small with the front margin nearly straight like the hinder one; the external one is dilated in the middle into a rounded lobe, and consequently has

a very strange form. With the exception of cell 4, and the exterior part of cell 5 and 6, which are hyaline, the hind wings are covered with brown-fulvous scales.

The veining of the wings is very remarkable. There are eleven branches running to the margins of the fore wings.

1*a*, 1*b* and 2 agree with those of the genus *Psyche* Schrk, 4 and 5 are united into a fork; 8 is emitted from the middle of 7 and reaches the apex; 9 is also emitted from 7, but more backwards; 10 comes from the upper exterior angle of the discoidal cell, which is very broad but relatively short and divided in two parts by a thin vein, neither forked in the fore nor in the hind wings; of these parts the superior one is longer and more acute than the inferior one; 11 is entirely free.

In the hind wings there are only seven marginal branches. 1*a*, 1*b* and 1*c* are as usual, 2 also; 3 and the forked 4 and 5 are very short, because the inferior part of the discoidal cell, from which they are emitted, is much longer than the superior part, and its lower exterior angle almost reaches the external margin; 6 comes from the upper exterior angle of the cell mentioned and 7 is entirely free.

The place of this new species of Psychid is, after *Psyche Ecksteini* Led., in the genus *Acanthopsyche* Heylaerts, group C, *Amicta* Heyl. (vide my „Monographie des Psychides”: *Annales de la Soc. Entom. de Belgique*, 1881).

I have named the new species in honor of my friend, the learned and zealous conservator of the Leyden Museum.

Breda, March 1881.

NOTE XXV.

ON A NEW COLLECTION OF PODOPHTHALMOUS
CRUSTACEA, PRESENTED BY MR. J. A. KRUYT, COL-
LECTED IN THE RED SEA NEAR THE
TOWN OF DJEDDAH.

BY

Dr. J. G. DE MAN.

Mr. J. A. Kruyt, Dutch consul at Djeddah, again presented many very interesting podophthalmous crustacea to our Museum, for which we feel very grateful, because they complete in a high degree our collection of Red Sea crustaceans. Before stating my observations on some forms I wish to give a list of the species and specimens collected, to illustrate in some sense the comparative frequency of occurrence of some species.

LIST OF THE SPECIES COLLECTED.

- | | | |
|----|--|--------------|
| 1. | <i>Tylocarcinus styx</i> Herbst | 3 specimens. |
| 2. | <i>Cyclomaia spinicineta</i> Heller | 2 » |
| 3. | <i>Stilbognathus erythraeus</i> Martens. | 1 » |
| 4. | <i>Lophactaea cristata</i> Alph. M. Edw. | 5 » |
| 5. | » <i>granulosa</i> Rupp. | 1 » |
| 6. | <i>Actaea tomentosa</i> M. Edw. | 1 » |

7.	<i>Actaea hirsutissima</i> Rupp.	. . . . .	3 specimens.
8.	» <i>rufopunctata</i> M. Edw.	. . . . .	3 »
9.	» <i>helleri</i> Alph. M. Edw.	. . . . .	3 »
10.	» <i>nodipes</i> Heller	. . . . .	2 »
11.	» <i>fossulata</i> Girard	. . . . .	4 »
12.	<i>Chlorodius niger</i> Forsk.	. . . . .	58 »
13.	» <i>sculptus</i> Alph. M. Edw.	. . . . .	1 »
14.	<i>Phymodius obscurus</i> Lucas	. . . . .	16 »
15.	<i>Chlorodopsis spuiipes</i> Heller	. . . . .	1 »
16.	<i>Etisus laevimanus</i> Randall.	. . . . .	12 »
17.	<i>Cymo andreossyi</i> Aud.	. . . . .	3 »
18.	<i>Trapezia cymodoce</i> Herbst.	. . . . .	71 »
19.	» <i>rufopunctata</i> Heller	. . . . .	13 »
20.	» <i>digitalis</i> Latr.	. . . . .	6 »
21.	» <i>ferruginea</i> Heller.	. . . . .	6 »
22.	» <i>guttata</i> Rupp.	. . . . .	3 »
23.	<i>Tetralia cavimana</i> Heller	. . . . .	3 »
24.	<i>Neptunus pelagicus</i> L.	. . . . .	1 »
25.	<i>Thalamita savignyi</i> Alph. M. Edw.	. . . . .	15 »
26.	<i>Thalamitoïdes tridens</i> Alph. M. Edw.	. . . . .	2 »
27.	<i>Metopograpsus messor</i> Forsk.	. . . . .	1 »
28.	<i>Pagurus scabrimanus</i> Dana?	. . . . .	1 »
29.	<i>Calcinus intermedius</i> n. sp.	. . . . .	1 »
30.	<i>Coenobita rugosus</i> M. Edw.	. . . . .	2 »
31.	<i>Porcellana bosicii</i> Aud.	. . . . .	1 »
32.	» <i>carinipes</i> Heller	. . . . .	1 »
33.	<i>Alpheus edwardsii</i> Aud.	. . . . .	4 »
34.	» <i>strenuus</i> Dana.	. . . . .	3 »
35.	» <i>laevis</i> Randall.	. . . . .	65 »
36.	» <i>insignis</i> Heller	. . . . .	1 »
37.	<i>Hippolyte hemprichii</i> Heller	. . . . .	6 »
38.	<i>Gonodactylus graphurus</i> White	. . . . .	18 »
39.	<i>Bopyrus</i> sp. in <i>Trap. cymodoce</i> Herbst.	. . . . .	1 »

Tylocarcinus styx Herbst.

In two of the three male specimens, the hands are enlarged, and the fingers greatly arcuated as is figured by

Alph. Milne Edwards (Nouv. Arch. Mus. Hist. Nat. VIII, p. 247. pl. XI, fig. 4), but in the third specimen the hands are slender, the fingers straight and meeting over their whole length. I regard these differences as individual ones, as has been done also by Mr. Miers (Descript. of new or little known Spec. of Maioid Crustacea, in: Ann. and Mag. of Nat. Hist. for July 1879).

Lophactaea cristata Alph. Milne Edwards.

Lophactaea cristata, Alph. Milne Edwards, Nouv. Arch. Mus. t. I, pag. 246, pl. XVI, fig. 1. There are 5 specimens collected, one nearly adult male, one nearly adult female and three young females. — In all these specimens the crest on the upper margin of the hand is very distinctly developed, though being granular, but it is not only by this crest, that our species may be distinguished from the nearly allied *granulosa* Rupp., but especially also by its quite different facies, by the *much coarser* granules of the carapace, which are found also on the mesogastrical and cardiacal regions. —

Breadth of carapace of the largest male specimen 32 mm.

» » » » » female » 36 mm.

Lophactaea granulosa Rupp.

As has been remarked already by Mr. Hilgendorf (Monatsberichte Berlin. Akad. Nov. 1878, pag. 787), also a small granulated crest-like ridge often appears to occur on the upper margin of the hands of the common *Lophact. granulosa*, a species distributed throughout the whole Indo-Pacific region. I therefore think a very young male specimen of the collection (Breadth of carapace 17 mm.) to belong to the *granulosa*, the granules of the carapace being much smaller than in equally-sized specimens of the preceding species, and the mesogastrical and cardiacal regions being nearly *smooth*.

Actaea hirsutissima Rupp.

Two male specimens and an adult female with eggs are in the collection: the male specimens having the carapace 22 mm. broad, the adult female only 18 mm.

Actaea rufopunctata M. Edw.

The three specimens are again of the same small size as that, which I described in my former Note on the Djed-dah Crustaceans (Notes of the Leyden Museum, Vol. II, pag. 172), the largest male specimen having the carapace only 14 mm. broad. The grooves between the regions are covered with a dense pubescence, and the whole surface of the carapace is covered with tolerably long hairs. — I therefore still doubt whether these specimens really belong to the true *rufopunctata* Edw.

Actaea helleri Alph. Milne Edw.

Actaea helleri Alph. Milne Edwards, Nouv. Arch. Mus. Hist. Nat. I, pag. 270, pl. XVII, fig. 3, 3^a, 3^b.

Three fine specimens (2♂, 1♀) of this very rare species, the habitat of which was still unknown, were collected on the shores of the harbour of Mecca. — Carapace enlarged, convex in all directions, regularly curved anteriorly. Regions bordered by tolerably broad but shallow grooves and, like the nearly entire, undivided, finely curved anterolateral margins, provided with numerous, conical, acute small tubercles, that are less prominent and more granular on the cardiacal and intestinal regions; the few concave, nearly straight posterolateral margins being more minutely granulated. Front very deflexed and prominent, scarcely emarginate neither in the middle nor at the sides. Under surface of the carapace minutely granulated near the anterolateral margins, but the outer surface of the externall maxillipeds, of the sternal plate and of the terminal joint of the male abdo-

men are more or less punctate, the basal joints of it, like those of the oval female abdomen, being somewhat granular. The anterior legs are of the same size, both in the male and in the female, the arms not projecting beyond the lateral margins of the carapace; the outer surface of the carpopodites is provided with similar tubercles as on the carapace, like also the rounded upper surface and the outer surface of the hands, though these conical tubercles become smaller near the inferior margin and disappear at last entirely. The upper surface of the strongly curved mobile finger is armed with sharp small tubercles, the internal margins of both fingers being armed each with a strong basal tooth, on both sides of which a small tuft of stiff yellow hairs is found as well on the mobile as on the immobile finger (and not only on the latter, as is described by Mr. Milne Edwards); the ends of the fingers are acuminate and the internal surface of the hands is minutely granulated. Ambulatory legs compressed, the three terminal joints being armed with sharp small tubercles, and the external surface of the meropodites of the posterior legs as also the under margins of the meropodites of the other legs are granulated.

Our specimens are of a beautiful red colour, enhanced especially on the upper surface of the carapace by the dark red colour of the conical tubercles: the ends of the black fingers are white, and the black colour extends in the male from the immobile finger over the lower half of the outer and inner surface of the hands, but not in the female. The whole upper surface of the carapace, as also the outer surface of the legs is covered with numerous tolerably long and finely yellowish coloured hairs.

Breadth of carapace in the male 25 mm.

Length » » » » » 16 mm.

Breadth » » » » female 21 mm.

Length » » » » » 14 mm.

Actaea helleri may be easily distinguished by its entire, undivided anterolateral margins, the sharp conical tuber-

cles of carapace and legs, covered with long fine yellowish hairs and by the characteristic shape of the hands: the tufts of yellow hairs on both fingers, that are acuminate, the much curved mobile finger, the strong teeth of the latter, etc.

Chlorodius niger (Forskal) Rüpp.

The collection contains 58 specimens of different sizes of this very common Indo-Pacific species, varying greatly as regards the structure of the teeth of the antero-lateral margins, these teeth being sometimes (in young specimens) acute, in other individuals obtuse, quite as has been fully described by Alph. Milne Edwards (Nouv. Arch. Mus. t. IX, pag. 215).

Chlorodius sculptus Alph. Milne Edwards.

Chlorod. sculptus, Alph. Milne Edwards, Nouv. Arch. Mus. t. IX, pag. 217, pl. VIII, fig. 4.

A fine male specimen is in the collection, wholly agreeing with the description, though I will add something to it. — The carapace is 19 mm. broad and 12 mm. long, the two anterior teeth of the lateral margins being obtuse, the third a little more acute, and the fourth acuminate with a black point. The several lobes of the surface of the carapace, though being smooth, are minutely punctate and the posterior margin of the cephalothorax is somewhat granular. The upper margin of the meropodites and also the other joints of the ambulatory legs are *spinulose* (not granular, as says Milne Edwards) and covered with long yellow hairs. The upper (posterior) margin of the anterior legs is armed with three or four small obtuse granules.

Chlorodopsis spinipes Heller.

Pilodius spinipes Heller, Crustaceenfauna des Rothen Meeres, p. 340, pl. II. fig. 22.

Chlorodopsis spinipes, Alph. Milne Edwards, l. c. pag. 230, pl. VIII, fig. 6.

A single female specimen, with the carapace 8 mm. broad, is in the collection.

Etisus laevimanus Rand.

Four male and eight female specimens were again collected; in some specimens the surface of the carapace is ornamented with more or less numerous dark spots, more or less distinctly marked, (*Etisus maculatus* Heller), but in other individuals these spots are quite wanting, the carapace being coloured with some large dark spots. The largest specimen, a male, has the carapace 36 mm. broad.

Thalamita savignyi Alph. Milne Edw.

In all our specimens, ten males and five females, the surface of the carapace is covered with a dense pubescence of very short hairs. In one adult male there are only three spines on the left antero-lateral margin, but there are five teeth on the right, the fourth of which is rudimentary.

Thalamitoïdes tridens Alph. M. Edw.

Alph. Milne Edwards, Nouv. Arch. Mus. Hist. Nat. T. V., pag. 149, pl. VI, fig. 1 and 7.

A male and a female specimen provided with eggs are collected, as I think, for the first time in the Red Sea; our species is thus distributed throughout the whole Indo-Pacific region, being found also on the shores of Madagascar and Upolu. The breadth of carapace of the female (the distance of the external orbital angles) is only $10\frac{1}{2}$ mm.

Pagurus scabrimanus Dana?

A single specimen of *Pagurus*, inhabiting the shell of a *Strombus gibberulus*, is in the collection, which I refer with some doubt to the *Pag. scabrimanus* Dana. As regards the shape of the carapace, the relative length of the the eyes and of the vicinal parts, the shape of the larger hand and of the two last joints of the left ambulatory leg of the third pair, our specimen agrees very well with the figures of these parts of the body in the great work of the American naturalist. But I will allow myself the liberty to give a description of our specimen. The anterior part of the carapace is nearly shaped as that of the common *Pag. punctulatus* Oliv., but it is more depressed and flattened and also more transverse, being somewhat broader than long: its length (the distance from the front to the sutura cervicalis) measuring $5\frac{1}{3}$ mm., its breadth 6 mm. The anterior margin of the carapace is quite similarly shaped as in the *punctulatus*, the lateral margins are straight, the gastrical region has also the same form as in that species, the two lines that border it posteriorly making nearly a right angle with one another (in the *Pag. depressus* Heller, this angle is much more acute), and the distribution of the small tufts of hair on its surface and at the margins wholly agrees with that of the *punctulatus*. The eyes are rather short and gross, scarcely as long (the basal scale included) as the breadth of the anterior margin of the carapace, the basal scale of them being rather quadrangular and broad and armed with some few teeth and hairs on their anterior inner angle; they are a little longer than the peduncle of the external antennae, but scarcely as long as that of the internal. Carpopodite of the left anterior leg armed with some spines at its upper and outer margins and on the inferior part of the external surface. — Form of the larger (left) hand wholly agreeing with the figure of Dana; upper margin armed with many strong spines, under margin denticulate, upper

half of the convex outer surface spinulous, under half nearly smooth; upper margin of the mobile finger spinulous, outer surface of the fingers and upper half of the outer surface of the hand covered with many long scattered hairs, inner convex surface of the hand smooth with some few hairs. — Fingers acuminate with horny, a little spoonlike tips. Upper margins and outer surfaces of the carpopodite and the hand of the right anterior leg armed with many strong spines and more closely provided with long horny hairs than in the left leg. Tarsi of the ambulatory legs elongate and like the penultimate joints compressed; tarsus und penultimate joint of the left ambulatory leg of the third pair quite resembling Dana's figure, outer surface of the tarsus being flattened and provided with a longitudinal groove, its upper somewhat convex margin, as also the upper margin of the penultimate and the anterior margin of the antepenultimate joint being spinulose; the two last joints of these ambulatory legs closely covered with many horny long hairs.

Dana makes no mention of the occurrence of the long hairs on the hands in his *Pag. scabrimanus*, and the upper part of the outer surface of the larger hand appears to be less spinulous in this species than in our specimen; the mobile finger of the large hand, very spinulous in the Djeddah specimen, is «hardly spinulous” in the other. The *scabrimanus* occurs in the Philippine Archipelago, but this cannot cause any difficulties, many other species of *Pagurus* having also a wide geographical range, as for instance, the *Pag. punctulatus* that occurs in the Red Sea, the China seas and on the shores of the Sandwich isles. Our species may also be nearly allied to or identical with the *Pag. spinimanus* M. E. or the *scutellatus* M. E., but the description (without figure) of these species by Mr. Milne Edwards (Ann. Scienc. Nat. III Série, tome X, pag. 61) is too short for us to be able to recognize them. Our specimen is of a uniform light gray or yellowish colour without any spots.

Calcinus intermedius, n. sp.

A single specimen of *Calcinus*, inhabiting like the preceding species, the shell of a *Strombus gibberulus*, was collected at Djeddah and I think it to be new, though it is most closely allied to *Calcinus rosaceus* Heller from the Red Sea and *Calcinus nitidus* Heller from Taiti.

I will first mention the characteristic differences between these two species and afterwards describe our specimen more fully.

Our species may be distinguished at first sight from the *rosaceus* Heller by the rounded convex upper margin of the larger hand being *quite unarmed*, without tubercles, by the fingers of the larger hand being punctate but not granular and by its coloration, the basal half of the tarsi being violet-colored. It differs from the *Calcinus nitidus* from the shores of Taiti distinctly by the under margin of the larger hand not being rounded, but being rather *acute and granular*, by the more hairy ambulatory legs and also by the coloration, the larger hand being quite of a white color without yellowish spots as are seen in the Taiti species.

Anterior part of carapace rather a little convex, smooth, punctate anteriorly, somewhat hairy on the lateral margins; gastrical region only defined posteriorly by two lines that make an almost right angle with one another, but without a short median line in its anterior part as is found in the *rosaceus* of Heller. Rostrum very small, triangular and acute, external angles of the frontal margin rather rounded.

Eye-peduncles very slender, longer than the width of the frontal margin, and also much longer than the peduncles of the external and internal antennae; ophthalmic scales extremely small, triangular and acute. Basal spine of the external antennae very short. Anterior legs very unequal, arm with an acute upper margin; upper margin of the carpus rounded and terminating anteriorly in a very small acute spine, its outer surface provided with a tubercle,

which is separated from the upper margin by a distinct groove, quite as appears to be the case with the *Calcinus rosaceus*. The larger (left) hand scarcely compressed, its outer surface rather convex, upper margin rounded, quite unarmed, under margin rather acute and provided with a ridge of granules; fingers nearly as long as the palm, slightly arcuated, leaving an hiatus when closed, their inner margins on the external side somewhat crenulated near the base, and provided with some hairs more internally; outer and inner surface of the palm quite smooth, the latter with some hairs near the articulation of the fingers, that are slightly excavated at the ends and minutely punctate. Arm of the right chelipede shaped as that of the left, carpus with an acute upper margin that is armed with two or three obsolete spines but terminates in a distinct spine; its outer surface rather little convex and smooth. Hand much compressed, upper margin cristate and armed with five acute spines, under margin rounded, fingers very short, with excavated tips, upper surface of the mobile finger rounded and armed with some small spines placed biserially; outer surface of the palm and of the fingers covered with some few hairs. — Ambulatory legs of the second and third pair a little longer than the larger (left) chelipede; tibia of the second pair armed with two spines, a larger and a smaller one, on the anterior margin, tibia of the third pair only with one spine; tarsi scarcely shorter than the penultimate joints, armed with a series of minute spines on their inferior margin, claws rather curved: — the two last joints of these legs being provided with some scattered tufts of hair both on their upper and under surfaces.

As regards the coloration of our specimen (preserved in spirits), it is of a light rose colour, more especially pronounced on the anterior part of the carapace, and on the meri and carpi of the legs; the anterior margins of the meri and of the carpi of the chelipedes are coloured bluish, the larger hand entirely of a white colour except the bluish-

marked articulation of the mobile finger; the spines on the upper margin of the right hand and the articulation of its mobile finger being also of a light bluish colour, but the ends of the fingers are quite white. The basal half of the penultimate joints of the two ambulatory legs is rose-coloured, the distal half white, and the basal half of the tarsi is marked with the characteristic violet cincture, the distal part being again white: finally the claws are black.

The length of the whole cephalothorax of our specimen measures nearly 10 mm., the width of the frontal margin 4 mm., the length of the eye-peduncles 5 mm., the length of the larger hand (fingers included) 9 mm., its height $4\frac{1}{2}$ mm., mm. near the articulation of the mobile finger.

Porcellana boscii Aud.

A single female specimen. The carapace and the ambulatory legs are of a light yellowish reddish colour, the chelipedes of a beautiful rose-colour: the whole upper surface of the animal is spotted with numerous dark red spots, which are somewhat more intensely-coloured on the chelipedes. Anterior margin of the carpopodite armed with four teeth.

Porcellana carinipes Heller.

Heller, Beiträge zur Crustaceen-Fauna des rothen Meeres, in: Sitzungsber. Kais. Akad. der Wissensch. XLIV. Band, pag. 257, taf. II, fig. 5.

A very fine female specimen was collected. Though it wholly agrees with the quoted description, it may be allowed to add a few particulars. — In our specimen the whole upper surface of the carapace, except the cardiacal and intestinal regions, is covered with short transverse rugose lines, which are provided anteriorly with very short hairs as in the preceding species, and the car-

diacal and intestinal regions are also a little hairy. The anterior margin of the meri of the chelipedes is provided with two spines near the inner angle, a larger outer and a smaller inner one, and with a strong spine at the external angle. The anterior margin of the carpi of *both* chelipedes is armed with three teeth, the posterior margin with four teeth, becoming gradually smaller backwards. The outer margin of both hands armed with six very small teeth. The upper surface of the carpi and of that part of the hands, which is situated outwards of the elevated ridge, is covered with many curved rugose lines that are hairy anteriorly; the remaining external part of the surface of the hands closely covered with numerous similar but very small and short rugose hairy lines. Our specimen is very beautifully coloured, being of a light rose colour, and marked with purplish red and white large spots, the penultimate and antepenultimate joints of the ambulatory legs being violet-coloured with some few white cinctures.

Alpheus edwardsii Aud. and *Alpheus strenuus* Dana.

Conf. Hilgendorf, Die in Moçambique gesammelten Crustaceen, in: Monatsberichte der Akad. der Wiss. zu Berlin. Nov. 1878. pag. 830.

Four specimens of the true *A. edwardsii* Aud. and three of the form, regarded by Hilgendorf as belonging to the *A. strenuus* Dana were collected at the same locality. The former wholly agree with the figure of Savigny in the «Description de l'Egypte, Taf. X, fig. 1", as regards the relative length of the ambulatory legs of the second and third pair and the relative proportions of the joints of the carpus: the legs of the second pair being rather longer than that of the third pair, and the second joint of the carpus being longer than the fifth. Our four specimens are all females, provided with eggs.

Like Mr. Hilgendorf, I too cannot decide positively,

whether our three other specimens ¹⁾, which, according to that author, on account of the shape of the smaller hand should be referred to the *strenuus* Dana, are male or female, *but they are not provided with eggs*. Except in the shape of the smaller hand and of the second joint of the abdomen (Hilgendorf, l. c. p. 831), these specimens however *wholly* agree in all respects with the four other specimens of the true *edwardsii* in our collection, as regards the relative length of the legs of the second and third pair and the relative proportions of the joints of the carpus. Might it therefore not be possible that the described differences in the shape of the smaller hand and of the second joint of the abdomen must be regarded as sexual ones? This is however only a mere supposition. I however will add still this: according to the diagnose of the *Alpheus strenuus* by Dana, the second joint of the peduncle of the internal antennae should be almost twice as long as the first, and the first and the second joint of the carpus should be nearly equal: in our three specimens however, (wholly agreeing in these points with the four *edwardsii*-specimens), the second joint of the peduncle of the internal antennae is but little longer than the first joint, and the first joint of the carpus is distinctly much longer than the second joint. I therefore am inclined to presume the true *strenuus* Dana to be a species different from our form, and the latter to be the male of the *Alph. edwardsii* Aud.

Alpheus laevis Randall.

More than 60 fine specimens, of which the half females, were collected. This species is therefore very common on the Djeddah shores, but it is recorded from the whole Indo-Pacific region. In nearly all our specimens,

1) These specimens entirely agree with an *Alpheus*, presented by Mr. Kossmann to our Museum under the name of *Alpheus crassimanus* Heller. But I think the *Alpheus crassimanus* Heller to be a quite different, though allied species.

the two hands of the chelipedes are marked with more or less numerous spots of a dusky gray, and often the beautiful red colour of these hands is more or less extensively substituted by a light grayish colour. In one specimen I observed a remarkable monstrosity: the orbits being united with one another, the substance of their walls passing over and pressing down the rostrum, the orbits being almost rounded anteriorly without spines.

Alpheus insignis Heller.

Heller, l. c. pag. 269, taf. III, fig. 17, 18.

A single fine female specimen is in the collection. The second joint of the carpus of the second pair of legs is distinctly *longer* than the first.

Hippolyte hemprichii Heller.

Heller, l. c. p. 275, Taf. III, fig. 23.

Six specimens of this species were collected, but I think it most probable this form is identical with the common *Hippolyte gibberosus* M. Edw.

LEIDEN, March 1881.

NOTE XXVI.

REMARKS ON THE SPECIES OF MATUTA FABR.
IN THE COLLECTION OF THE LEYDEN MUSEUM.

BY

Dr. J. G. DE MAN.

The carcinological collection of our Museum contains no less than 270 specimens of the genus *Matuta* Fabr., preserved in spirits, collected in the seas of the Indo-Pacific Region, from the shores of the Red Sea to those of the eastern islands of the Malayan Archipelago. They belong to six different species, among which the very common *Matuta victrix* Fabr. is represented by no less than nearly 200 specimens, the very rare *Matuta granulosa* Miers on the contrary only by one single individual. Mr. Miers in his excellent Monograph of this genus distinguished nine species and afterwards described a tenth, the *Matuta circulifera* Miers. Of these forms the *Matuta laevidactyla* Miers is not represented in our collection, while the *Matuta lineifera* Miers, *Matuta circulifera* Miers and *Matuta obtusifrons* Miers must be united, the former two with the *Matuta lunaris* Herbst (*rubrolineata* Miers), the third with the *Matuta picta* Hess (Miers), as remarkable varieties of these species.

As characters of first importance in the definition of the species must be considered: the course of the ridge on the outer surface of the hands of the male; the presence and

shape of the spines or tubercles with which the latter is armed, and the ridge on the mobile finger being beaded over its whole length or not. I regard as characters of second importance the greater or lesser development of the tubercles on the surface and on the lateral margins of the carapace, and the more or less distinct granulation of the latter and of the outer surface of the hands, while the manner of coloration of the cephalothorax must be considered as a character of a very slight value.

Accepting of the two sections, into which Mr. Miers divides the species of *Matuta*, I admit in the first section (A) two species: *Mat. victrix* Fabr. and *Mat. lunaris* Herbst, the former with the variety *crebrepunctata*, the latter with two varieties, called *lineifera* and *circulifera*; in section (B) I admit the *Mat. granulosa* Miers, *banksii* Miers, *maculata* Miers and *picta* Hess, the latter with the variety *obtusifrons*; the *Mat. laevidactyla* Miers is still unknown to me.

1. *Matuta victrix* Fabr.

Matuta victrix, Miers, A revision of the Species of the Genus *Matuta*, in: Transactions of the Linnean Society of London, II Series, Zoology, Vol. I, Part the fifth, pag. 243, pl. XXXIX, fig. 1—3.

The collection of the Museum contains:

1^o. Nearly seventy specimens, collected by Messrs. Pollen and van Dam in the Bay of Pasandava, which *wholly* agree with the above-mentioned description and figures: the spots upon the carapace being numerous, minute, simple and without any tendency to form reticulating lines. The antero-lateral tubercles are scarcely prominent, those of the surface and of the postero-lateral margin being also little developed. Lateral spines straight in the male, slightly directed backwards in the female.

2^o. A female specimen from the Red Sea, presented by

Mr. Kossmann, similar to the preceding, but with the spots larger and less numerous, though simple.

3°. Thirteen specimens, collected in the Java seas, presented by Mr. Bleeker, in which the spots of the carapace, as in the Pasandava animals, are very numerous and minute, though sometimes marked with a paler centre, except in one single male specimen where the spots are more numerous, darker red, and form irregular small curved lines and circles, interspersed with simple spots: a remarkable variety as regards the coloration of the carapace.

4°. Seven individuals, collected by Mr. Semmelink on the shores of Bezoeki (Java). In these the spots are very numerous, more crowded, and form small compound spots with paler centre; the tubercles of the carapace, like those of the postero-lateral margin, are more distinctly marked than in the Madagascar specimens but the granulation is the same. They belong to the variety: *crebrepunctata* Miers, but they ought not to be classed as a distinct species.

5°. A fine male from the island of Obi, agreeing with the Bezoeki specimens and belonging to the same variety.

6°. A male specimen from the island of Waigeoei, similar to the Madagascar individuals but having the spots less numerous.

7°. Five examples from the shores of Macassar, Celebes, belonging to the described variety.

8°. Fifteen specimens, collected near the island of Batjan, also similar to the Bezoeki variety.

9°. Three specimens from the island of Sanghir, two of which belong to the above-mentioned variety, but in the third specimen, a large adult male, the spots of the carapace are rather minute and simple, but very crowded and numerous; it forms in some sense a remarkable transition from the typical form to the variety: *crebrepunctata*.

Besides these, our collection contains 70 specimens without locality, for the greater part belonging to the var: *crebrepunctata* mihi.

This species has a wide geographical range, from the Red Sea to the Australian shores throughout the whole Indian Ocean and the Malayan Archipelago; it presents however many local and individual varieties as regards the coloration of the carapace and the more or less distinct tubercles with which it is armed.

2. *Matuta lunaris* Herbst.

Matuta rubrolineata, Miers, l. c. pag. 244, pl. XXXIX, fig. 5 and 6. *Matuta lineifera*, Miers, l. c. pag. 245, pl. XXXIX, fig. 7. *Matuta lunaris* Herbst, Miers, On Malaysian Crustacea, in: Ann. and Mag. of Nat. Hist. for March 1880, pag. 28, footnote. *Matuta circulifera*, Miers, loco eodem, pag. 27, pl. XIV, fig. 5.

The collection contains:

1^o. A fine male adult specimen without locality, belonging to the typical *lunaris* Herbst (*rubrolineata* Miers), as defined by Hilgendorf, (Monatsb. Ak. Berlin, p. 810, 1878). Distance from the ends of the lateral spines measuring 47 mm., length of the carapace 38 mm. Lateral marginal spines straight and acute; anterolateral and posterolateral tubercles like those of the surface of the cephalothorax very faintly marked, two anterior being quite obsolete. Carapace rather finely granulated. Lobes of the front and extra-orbital angles acute.

2^o. A somewhat smaller male specimen, collected near the island of Banka by Mr. van den Bossche (1861), wholly agreeing with the preceding one.

3^o. A female specimen, collected in the Java seas by the late Mr. Bleeker. Carapace very finely granulated, nearly smooth, tubercles all obsolete; those of the anterolateral and posterolateral margins as faintly developed as in the

described males. Distance from the ends of the lateral marginal spines 35 mm. Also belonging to the typical *lunaris* Herbst.

4°. A nearly adult male and two young female specimens, without locality, belonging to the variety *lineifera* mihi. Carapace rather more finely granulated, antero-lateral tubercles somewhat more distinctly marked, those of the surface less faintly developed, but those of the postero-lateral margins as faintly marked as in the typical form. Lateral marginal spines slightly directed forward in the male, quite straight in the females. For the rest *wholly* agreeing with the true *lunaris* Herbst.

5. Finally five specimens (2 ♂, 3 ♀), presenting the characters of the *Mat. circulifera* Miers: Front distinctly emarginate, with the lobes formed as in the variety *lineifera*. Anterolateral and postero lateral tubercles, like those of the surface nearly as much marked as in the latter variety; lateral marginal spines rather long, straight in the male, a little directed backward in the female. Carapace rather more coarsely granulated than in the preceding variety, marked with strongly defined complete distinct circles, which however can also be distinguished in the male specimen (N°. 4) that belongs to the variety *lineifera*, though they are here very faintly defined by threadlike lines which are *as delicate* as the other lines with which the carapace is marked. For the rest entirely agreeing with the preceding specimens.

It may be allowed to add a very striking character to those given by Mr. Miers, by which the *Mat. lunaris* Herbst may be distinguished at first sight from the closely allied *Mat. victrix* Fabr. In the latter species the external angle of the palm at the end of the inferior margin is armed both in the male and in the female with a conical spine, that is somewhat smaller than the strong conical spine at the base of the oblique ridge on the outer surface of the hand: in the *Mat. lunaris* Herbst however, the first-mentioned smaller spine at the external angle of the

palm is totally wanting in both sexes; Mr. Miers does not make mention of this character.

Matuta lunaris Herbst with its two remarkable varieties occurs in the Indian and Pacific Oceans, the Malayan Archipelago as far as the shores of N. W. Australia, and appears to be a rather rare species.

3. *Matuta granulosa* Miers.

Miers, On the Oxystomatous Crustacea, pag. 245, pl. XXXIX. fig. 8 and 9.

A very beautifully colored female specimen, collected on the shores of the island of Amboina, was presented by Mr. Ludeking some years ago. It belongs without any doubt to *Mat. granulosa* Miers, though presenting a remarkable variety as regards the coloration of the carapace, the *simple*, minute, dark red spots being disposed in *symmetrically* reticulating strings which surround spotless places that are smaller and more crowded anteriorly. In our specimen the carapace is also rather *finely* granulated, but the granulation of the cephalothorax is known to be variable in the species of this genus, as we have seen in the *Mat. victrix* Fabr. The antero-lateral obtuse tubercles are nearly equally developed as in *Mat. banksii* Miers, but in some less degree than in *Mat. picta* Hess. Tubercles of the surface of the carapace, like those of the postero-lateral margins very *faintly* marked.

Lateral spines *short*, obtuse, slightly directed forward. Front obtuse, very indistinctly emarginate, with the lobes rounded. Ridge upon the outer surface of the hands with five acute *tubercles* (no spines), the second of which is the largest, the fourth being also a little larger than the three remaining. Lower part of the hand granulous; close to the inferior margin occurs a granular line, which proceeds on the immobile finger, and is formed by some large round depressed tubercles in the middle, that diminish gradually towards the immobile finger and towards the external angle

of the inferior margin: quite a similarly shaped granular line is found in the females of *Mat. banksii* and *Mat. picta*. Under surface of this finger somewhat granular like in the two latter species. Ridge upon the immobile finger obsolete.

Mat. granulosa appears to be very rare, our large *Matuta*-collection containing but one single specimen of it. It is found in the Eastern Seas, and may be distinguished from the allied *picta* Hess and *banksii* Miers by the characteristic ridge on the outer surface of the hand being divided in both sexes into five acute *tubercles*, the second of which is the largest. The female of our species differs from the females of these two species by the fourth tubercle of this ridge being no *spine* and by the acute tubercle at the external angle of the inferior margin being *wanted*. The length of the carapace of our specimen measures 25 mm., the distance of the ends of the lateral spines 35 mm.

4. *Matuta banksii* (Leach?) Miers.

Matuta banksii, Miers, on the Oxystomatous Crustacea, pag. 245, pl. XL, fig. 1 and 2.

The Museum contains, besides some typical specimens without locality, rather very fine examples of the following localities:

1^o. Eleven specimens from the island of Amboina, entirely agreeing with the above-mentioned figure, having the carapace marked with numerous pink spots, that are crowded together anteriorly and form large compound spots with paler centre at its posterior portion. Last and penultimate joints of the ambulatory legs marked with a large pink blotch.

2^o. A female from the shores of the island of Ceram, similar to the preceding specimens.

3^o. A fine male from the Timor seas, also quite similar to the Amboina specimens and presented by Dr. Wienecke.

4^o. Four beautiful specimens, collected near the island of Sanghir by Mr. Hoedt, wholly agreeing with the preceding but having the carapace otherwise marked, the spots forming small curved lines and circles, that are lar-

ger posteriorly but more crowded on the anterior portion of the cephalothorax.

To the characters of this species, given by Mr. Miers, it may be allowed to add the following: The fourth spine on the external surface of the hand is smaller than the second, both in the male and the female, though in a less degree in the latter. In both sexes an acute tubercle is found at the external angle of the hand at the base of the granular line which extends near the inferior margin, proceeding upon the immobile finger; this *tubercle* being represented in *Mat. victrix* Fabr. by a stronger acute *spine*. The larger striated plate on the inner side of the hands prolonged in the direction of the stripes. The hands of both sexes nearly quite similar to each other.

Matuta banksii Miers has been recorded from the Indian Archipelago (Amboina, Celebes, Bali, Ceram, Timor, Sanghir), New Guinea, the Philippine Islands and the China seas.

Except in its different coloration, this form of *Matuta* is most closely allied to *Mat. picta* Hess (Miers). The males however may be easily distinguished by the acute, triangular, fourth spine on the outer ridge of the hand, it being obtuse and truncate in *Mat. picta*, but when I compare a female Pasandava-specimen of *Mat. picta* with a female Amboina-specimen of *Mat. banksii*, I find the hands wholly similar to each other and only the following differences are to be mentioned: the carapace being somewhat more granulated in the latter species, the antero-lateral tubercles less strongly developed and the lateral spines a little shorter than in *Mat. picta*, so that the females of both species can be distinguished only by the external appearance and the coloration of the cephalothorax.

5. *Matuta maculata* Miers.

Miers, on the Oxystomatous Crustacea, p. 246, pl. XL, fig. 3 and 4.

The Museum contains eight specimens (6 ♂, 2 ♀) of this species, which I found in an unlabelled phial together with specimens of *Mat. victrix* Fabr., var. *crebrepunctata*, *Mat. banksii* Miers and *Mat. lunaris* Herbst, probably originating from the Japanese collection.

With regard to its outward appearance, it greatly resembles young specimens of *Mat. victrix* Fabr., but on closer examination it may be easily distinguished. The carapace is distinctly but finely granulated; antero-lateral margins, with regard to the length of the carapace, comparatively shorter than those of *Mat. victrix* Fabr., antero-lateral tubercles as strongly marked as in that species, tubercles of the surface and of the postero-lateral margins nearly *obsolete*. Front rather little emarginate, with the lobes rounded. Lateral marginal spines *very long*, acute and straight or slightly directed forward. Hand of the male nearly resembling that of *Mat. banksii*, lower part granular with a granular line composed of round granulous depressed tubercles of different size near the inferior margin, the latter armed with some small acute tubercles; at the base of the described granular line near the articulation with the carpus, a small acute tubercle is found in both sexes. Ridge on the outer surface *parallel* with the inferior margin, provided with five prominences, of which the first, third and fifth are indistinct tubercles, the second and the fourth larger, acute, the second being stronger than the fourth. Mobile finger with a ridge that is very finely striated over the greater part of its length, and obscurely beaded towards its distal extremity. Larger striated plate on the inner surface prolonged in the direction of the stripes. Hand of the female having the same form and sculpture as that of the male, in our two specimens the fourth spine on the outer ridge being comparatively stronger than in the male. Ridge of the mobile finger *obsolete*.

Our species therefore may be easily distinguished from those in which the outer ridge of the hand of the male

is parallel with the inferior margin (Section B, Miers), by the little prominent antero-lateral tubercles, by those of the surface and of the postero-lateral margins being nearly obsolete, by the extraordinary *long* lateral marginal spines, by the structure of the external ridge of the hands etc.

The coloration of our specimens has unfortunately much faded, but seems to be marked by numerous, minute spots.

Our largest male specimen has the carapace, measured *between* the marginal spines, 27 mm. broad, and 26 mm. long: length of the marginal lateral spines 9 mm. (In other specimens the spines being rather longer).

The acute triangular groove on the middle of the upper margin of the immobile finger, a character of the *mature* male, occurs already in one of our specimens in which the carapace is only 22 mm. long.

Mat. maculata Miers occurs in the eastern and Chinese seas and appears to be a rather rare species.

6. *Matuta picta* (Hess.) Miers.

Matuta picta Hess, Archiv für Naturg. XXXI, pag. 158, pl. VI, fig. 13. (1865). — *Matuta picta*, Miers, On the Oxy stomatous Crustacea, pag. 246, Pl. XL, fig. 5—7. — *Matuta distinguenda* Hoffmann, Recherches sur la Faune de Madagascar, Crust. p. 27, Pl. VI and VII (1874). — *Matuta obtusifrons*, Miers, l. c. pag. 247, pl. XL, fig. 8 and 9. Our collection contains:

1°. Seventeen fine specimens (8 ♂, 9 ♀), collected in the Bay of Pasandava (Madagascar), by Messrs. Pollen and van Dam, types of the *Matuta distinguenda* Hoffmann.

2°. Three beautiful specimens (2 ♂, 1 young female), collected on the shores of the island of Banda-neira (Moluccas), lately presented by Mr. Semmelink.

Our Pasandava-specimens entirely agree with Mr. Miers' description of *Mat. picta*, so that *Mat. distinguenda* Hoffmann is certainly identical with *Mat. picta* Hess. The figures of

this species in the »Recherches sur la Faune de Madagascar", are occasionally a little inaccurate, but some figures, as for instance the one of the right hand of the male (Pl. VII, fig. 56), which seems to represent *two* spines on the outer ridge, and those of the hand of the female (Pl. VI, fig. 49 and 50), where the immobile finger seems to be very short, are nevertheless exact, these hands being figured in an oblique direction. In all our specimens the spots are disposed symmetrically in very thin threadlike reticulating lines. The front in some individuals is very slightly emarginate, in others it is entire. The females are of a smaller size than the males. The relative length of the lateral spines of the carapace is somewhat variable.

As regards the three Banda-Neira specimens, these *wholly* agree with the preceding except in the coloration, the carapace being marked with dark purplish red lines, «that form irregular loops and circles, which are smaller and more crowded anteriorly, and interspersed with spots". The front is entire and rounded, like in some of our Madagascar specimens. Lateral spines rather short. They entirely resemble the figure of *Mat. obtusifrons* Miers (Pl. XL, fig. 8 and 9) and I therefore regard this species as a variety of *Mat. picta* Hess, being only distinguished by its different coloration.

Mat. picta Hess has a wide geographical range, being recorded from Ceylon, Zanzibar, Madagascar, Seychelles, Mauritius, the Moluccas, Fiji Islands, New Hebrides and Australian seas.

Though displaying many varieties in its coloration, our species possesses nevertheless the following striking characters, by which it is easily distinguished from the other species:

Carapace distinctly granulated, especially in the centre and towards the lateral spines, that are of moderate, though somewhat variable length and directed slightly forward. Three *large* tubercles on the antero-lateral margins, like those of the surface and of the postero-lateral margins

strongly marked. Front rounded, entire or slightly emarginate. Hand in the male not granulous upon its external surface, in the female a little granular upon the lower part, but presenting in both sexes a granular line close to the inferior margin with a small conical spine at its base near the articulation of the carpus and proceeding on the immobile finger, the latter moreover armed with some small acute tubercles at the base of its under margin: this granular line and these acute tubercles are not seen in the male of *Mat. victrix* Fabr., though a faint granular line also occurs in the female of this species, but without the acute tubercles of the base of the immobile finger. Ridge on external surface crossing it *parallel* with the lower margin and terminating at the base of the upper margin of the immobile finger, divided into five lobes; in the male the second being an acute spine, *the remaining small, obtuse or truncate*, in the female the second and also the *fourth* being acute, *spiniiform*. Ridge upon the mobile finger of the male distinctly striated in the greater part of its length, and *beaded at its distal extremity*, that of the female being obsolete. The larger striated plate on the inner side of the hands prolonged in the direction of the stripes.

Leiden, March 1881.

7209. Aug. 26. 81.

NOTES

FROM THE

LEYDEN MUSEUM

EDITED

BY

Prof. H. SCHLEGEL

Director of the Museum.

VOL. III.

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N<sup>o</sup>. 3. July 1881.  
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Sm LEYDEN

E. J. BRILL.

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1) Correction: p. 161 line 3 (from top of diagnosis), for „albo-spinosis” read „albo-annulatis”

NOTE XXVII.

CARCINOLOGICAL STUDIES IN THE LEYDEN
MUSEUM.

BY

Dr. J. G. DE MAN.

N^o. 1.

Telphusa africana Alph. Milne Edwards.

Telphusa africana, Alph. Milne Edwards, Nouv. Arch. du Muséum, T. V, pag. 186, pl. XI, fig. 2 and 2^a.

The Museum has lately received a fine series of nine specimens of various ages of this species which was shortly described by Mr. Alph. Milne Edwards after a very young individual, so that I am enabled to give a more complete description of this form. As regards its external appearance, this species very much resembles the Indian *Paratelphusa tridentata* Milne Edwards, so that one is almost inclined to refer it to the genus *Paratelphusa*.

Carapace much broader than long, flattened, with the granular antero-lateral margins arched and armed with two equal epibranchial teeth behind the acute external orbital angle; length of the anterior epibranchial tooth a little shorter than that of the external orbital angle. Upper surface of the carapace punctate; cervical groove rather deep, some oblique rugose lines near the antero-lateral and postero-lateral margins of the carapace. Post-frontal ridge very distinct, straight, interrupted in the middle, but running uninterruptedly down to quite near the posterior epibranchial

chial teeth, where it ends abruptly, there being still a small rugosity between these teeth and the ends of the ridge. That part of the carapace which lies before the post-frontal ridge is but little lower than the rest of it; front measuring nearly one third of the greatest breadth of the carapace, with the anterior margin widely but little emarginate. Orbits nearly twice as broad as high, with the upper margin sinuous and the under margin a little arcuate; internal surface of the orbits at the external side a little hairy. Terminal joint of the male abdomen triangular, a little shorter than broad (at its base); penultimate joint quadrangular, a little broader than long; antepenultimate joint nearly thrice as broad as long. Female abdomen very large and broad, its base more than twice as broad as it is long, with the tip rounded; penultimate joint nearly thrice as broad as long, with the lateral margins scarcely arcuate; the abdomina of both sexes furnished with scattered punctulations, like also the sternum of the male; anterior part of the female sternum hairy, as far as covered by the terminal joint of the abdomen.

Chelipedes subequal; upper margin of the meropodites acute with many transverse rugosities, external surface rather convex and smooth, inner surface concave. Upper surface of the carpopodite punctate, smooth, with a strong spine at its internal angle; external surface of the hands smooth, upper margin rounded, obsoletely granular; under margin a little granular at its base. External surface of the immobile finger with a few longitudinal lines of fine punctulations, upper surface of the mobile finger rounded, minutely granulated and provided with five longitudinal series of punctulations: the two fingers lying close to each other, the tips crossing each other; internal margins armed with many rather small teeth, three or four being a little larger than the others. Acute upper margins of the strongly compressed meropodites of the ambulatory legs a little granulated, without teeth or spines; external surface smooth, that of the posterior legs punctate; under

margin of the propodite spinulose, dactylopodites slender and compressed with four ridges of acute spines.

Breadth of carapace of our largest specimen (a female) 59 mm.

Length » . . . » » » » 41 mm.

Breadth of anterior frontal margin of this specimen 18 mm.

Our specimens were collected by Messrs. Büttikofer and Sala in the rivers of Liberia, West Africa.

Leucosia neocaledonica Alph. M. Edw.,

Leucosia longifrons de Haan,

Leucosia pulcherrima Miers.

As has lately been remarked by Mr. K. Martin (Die Tertiärschichten auf Java, Leiden, 1880, pag. 128) and as I can confirm, *Leucosia neocaledonica* Alph. M. Edw. (Nouv. Arch. Mus. Hist. Nat. t. X, pag. 40, pl. II, fig. 1) without any doubt is identical with *Leuc. longifrons* de Haan. The form and granulation of the thoracic sinus is quite the same in both species, as are also the form and granulation of the anterior legs. The typical specimens of *longifrons* are also similarly coloured as has been described by the French naturalist. I regard *Leuc. pulcherrima* Miers (Trans. Linn. Soc. II Serie, Vol. I. pag. 236, pl. XXXVIII, fig. 4—6) too as a variety of these species, for it is only distinguished by different colouration of the carapace. I have found a dry specimen of *Leucosia* in our collection, from New-Caledonia, the carapace of which is similarly marked as in *Leuc. pulcherrima*, though the trilobate patterns on the anterior half of the carapace are not confluent in the middle line: in its principal characteristics however this specimen entirely agrees with a typical specimen of *Leuc. neocaledonica*, presented to our Museum by Mr. Alph. Milne Edwards. But I cannot find any marked difference between *Leuc. longifrons* de Haan and *Leuc. urania* Herbst, so that I believe the three above-mentioned species to be all identical with the species of Herbst, figured Tab. LIII, fig. 3

of his great work: for De Haan (Fauna Jap. pag. 133) describes no other differences than a supposed different size, the white-coloured frontal spot and the inner margins of the fingers being toothed over their whole length, but I regard these differences as of no importance. In most of our specimens of *longifrons* the front is of a paler colour than the rest of the carapace.

3. *Leucosia perlata* de Haan.

Leucosia perlata de Haan, Fauna Jap. pag. 134. *Leucosia pallida*, Bell, Monograph on the Leucosiidae, Trans. Linn. Soc. Vol. XXI, pag. 285, tab. XXX, fig. 2. *Leucosia obscura*, Bell, l. c. pag. 285, tab. XXX, fig. 3.

Besides two typical specimens of *Leuc. perlata* de Haan in a dry state, the collection contains:

1. A fine male specimen, lately collected by Mr. Semmelink near the island of Banda-Neira; the upper surface of the carapace and of the anterior legs are of a dark olive-colour, marbled with a somewhat lighter hue; four whitish spots on the anterior part, the two anterior lying at a greater distance from each other than the posterior; two dark spots behind. Fingers white, except at the base. A distinct row of granules on the inner margin of the hand. Tubercles of the upper surface of the arms of a yellowish red colour.

2. A female specimen from the shores of the island of Saughir.

3. A female collected on the south-coast of Ceram.

The latter two specimens are of quite a different colour, the upper surface of the carapace and of the legs being of a pale reddish brown, also marbled with a lighter hue; for the rest wholly agreeing with the male of Banda-Neira.

Comparing our typical specimens of *Leuc. perlata* de Haan with the description and figures of *Leuc. pallida* Bell, there can be no doubt that these forms are quite identical;

Mr. Miers moreover has shown (Ann. and Mag. of Nat. Hist. for March 1880, pag. 28) *Leuc. obscura* Bell to be the same species.

Pseudophilyra hoedtii n. sp.

The genus *Pseudophilyra* Miers (Proc. Zool. Soc. 1879, p. 40) differs from the true *Leucosiae* only by the absence of the so-called thoracic sinus, a cavity in the subhepatic region of the carapace, and includes, as far as I am aware, but two species, *Pseudoph. perryi* and *Pseudoph. tridentata*. I now have found in our collection two fine specimens, collected on the shores of Amboina by Mr. Hoedt, which by the absence of the thoracic sinus must be referred to *Pseudophilyra*. Our form may be closely allied to, may perhaps be even identical with *Pseudoph. tridentata* Miers of the Corean seas, but unfortunately only the carapace of this species has been described and when the hand which was also figured by Mr. Miers as probably belonging to that carapace, having been found in the same phial (l. c. Pl. II, fig. 4^a), really belongs to it, then our species is quite an other one, for the shape of the hands is quite different.

In its outer appearance both of the carapace and of the legs, our form closely resembles *Leucosia pubescens* Miers (Trans. Linn. Soc. 1877, pl. XXXVIII, fig. 22—24). Carapace (front included) more long than broad, punctulated with rather few scattered punctulations. Anterolateral margins a little sinuated in front of the base of the insertion of the chelipedes, beaded by granules, which are largest above the base of the anterior legs and diminish gradually in size towards the front. Posterior margin and postero-lateral margins defined by a beaded line, the granules of which being largest above the first pair of ambulatory legs and diminishing in size posteriorly. Space between the lateral margin of the carapace and the base of the chelipedes a little pubescent without granules. Frontal

margin tridentate, middle tooth projecting a little more than the lateral. Pterygostomian regions and sternum quite smooth in both sexes. Male abdomen with all the joints except the last coalescent, its lateral margins sinuated, resembling that of *Leuc. whitmeei* Miers. (Trans. Linn. Soc. II Serie, Vol. I, Pl. XXXVIII, fig. 18). Chelipedes wholly resembling those of *Leuc. pubescens* Miers (l. c. fig. 22). Upper surface of the arm with a group of very small tubercles at the base, covered by a patch of short dense pubescence, which extends on the external half of the basal third part of the upper surface, with one or two small tubercles in front of it; two distal thirds of upper surface quite smooth; anterior and posterior margins with a line of nine or ten tubercles.

Under margin also tuberculated and provided with a patch of dense pubescence at the base; external and under surface of the arms wholly smooth. Wrist convex and smooth with a line of three small tubercles at the inner margin. Hands with the palm more long than broad with rounded external margin, quite smooth except minutely granulated near the inner margin, which passes to a punctulated line on the immobile finger. Mobile finger rather longer than the other, a little arcuated and like the index minutely dentate on the whole inner margins. Under surface of the fingers with a punctulated line. Male chelipedes quite similar to those of the female. Colour greenish grey with a series of yellowish spots near the margins of the carapace, two white spots on each side of the gastric region, followed by a sinuated white line on each side of the cardiacal region. Anterior legs with the articulation and the base of the fingers orange-coloured; ambulatory legs whitish with the distal ends of the mero-podites and of the following joints also orange. Length of carapace $14\frac{1}{2}$ mm., breadth 12 mm.

Philyra scabriuscula Fabr.

Leucosia scabriuscula, Fabr. Suppl. Ent. Syst. p. 349.

Notes from the Leyden Museum, Vol. III.

Philyra scabriuscula, Milne Edwards, Hist. Nat. Crust. T. II, pag. 132, Pl. XX, fig. 9 and 10. — Bell, Monograph of the Leucosiidae, pag. 299.

The Museum collection includes:

1^o A series of 25 very beautiful specimens (6 ♂, 19 ♀), collected on the shores of Atjeh (Sumatra), lately presented by Mr. Walraven.

2^o A female specimen from the island of Amboina.

The description of this species being rather incomplete, I may be allowed to give a new one:

Carapace orbicular, as long as broad (when epistome included), depressed, minutely punctate on its whole surface, with a continuous beaded line defining the lateral and posterior margins; lateral and posterior regions of the carapace (branchial, cardiacal and intestinal regions) covered with numerous small white granules, frontal and protogastrical regions entirely smooth and polished: in some Atjeh specimens the posterior parts of the protogastrical regions are also covered with a few small granules and in the female Amboina specimen the whole surface of the carapace is granulous, except the frontal region. Frontal margin emarginated, with a small median tooth and rounded lateral lobes, external orbital angles rounded. Epistome extending far beyond the front: region between the antero-lateral margins and the lateral granulated margin of the epistome also somewhat granular. First joint of the sternum, which borders posteriorly the buccal cavity, being smooth in the male with a minutely granulated anterior margin, but entirely granulated in the female; anterior external angle of the second joint, which lies between the insertion of the chelipedes, covered with small white granules. In the male the anterior margins of the other joints and the lateral margins of the cavity that includes the abdomen are also granular. In the female the whole sternum as far as visible is granular. External margins of the stalks of the outer foot-jaws granulated in both sexes; palps extraordinarily dilatated, with the external margin

hairy. Lateral parts of the cephalothorax smooth, defined downwards by a beaded line, the posterior part of which being more coarsely granulated than the rest. The joints of the male abdomen are all united, except the last, though the sutures are visible: it is punctulated, as is also the sternum, the basal joint is granulated; in the same manner the basal joints and the basal part of the penultimate joint of the female abdomen are granulated. Anterior legs twice and a half as long as the carapace in the male, but only twice as long in the female. Arm slender, cylindrical, granulated, except a narrow longitudinal space on the middle of the upper surface; the under surface also nearly smooth, except at its base; the granules rather large, disposed in longitudinal series. Wrist smooth, with a few minute granules at the inner margin. Hands in the male elongated, depressed, smooth, minutely punctate; external margin of the palm granular, internal margin rounded, minutely granulated, the granules not disposed in longitudinal series (as described in Bell's diagnose); immobile finger a little shorter than the palm, mobile finger curved, longer than the other, both fingers longitudinally sulcate and minutely granular; inner margins toothed over the whole length, some large teeth alternating with smaller ones. In the female the fingers are somewhat longer than the palm, the lateral margins of the latter and the also sulcate fingers very minutely granulated. Ambulatory legs smooth, with the upper and under margins of the meropodites minutely granulated, tarsi lamelliform, the external surface with two longitudinal grooves, the internal surface carinate.

In our Atjeh specimens the upper surface of the carapace and the anterior legs are of a more or less dark cinerous gray, the hands being marbled with a lighter rose-colour; the under surface of the carapace, like the ambulatory legs, except the white tarsi, are of a pale rose-colour. The granules are all white.

Length of carapace (epistome included) of the largest male specimen 15 mm.

Breadth of carapace of the largest female specimen 15 mm.

Length of carapace (epistome included) of the largest female specimen 13 mm.

Breadth of carapace of the largest female specimen 13 mm.

Nursia plicata Herbst.

Herbst, Krabbe und Krebse, taf. LIX, fig. 2. *Nursia hardwickii* Leach, Milne Edwards, Hist. Nat. Crust. Tome II, pag. 137. *Nursia plicata*, Bell, Monograph on the Leuco-siidae, pag. 307, taf. XXXIV, fig. 4. *Nursia plicata*? Miers, On the Oxystomatous Crustacea, II Serie, Vol. I, part the fifth, 1877, pag. 240, Pl. XXXVIII, fig. 28.

A single male specimen, collected near Amoy (China) is in the collection. The anterior and especially the posterior margins of the arms of the anterior legs are thin, sharp-edged and granulated. *Cancer plicatus* is described by Herbst as having the lateral margins of the arms: »scharf erhöht und gekörnt,» so that there can be no doubt, that *Nursia hardwickii* Leach, having the margins of the arms also thin and sharp-edged, is identical with the species of Herbst.

Pagurus varipes Heller.

Heller, Sitzungsber. Akad. Wiss. Berlin, Bd. XLIV, pag. 244, Taf. I, fig. 1. Taf. II, fig. 2 und 2.

As far as I am aware, this beautiful *Pagurus* was hitherto found only in the Red Sea, where it seems to occur rather frequently; we received a fine specimen from the shores of Djeddah and another from the Red Sea, presented by Mr. Kossmann, both preserved in spirits. Now Mr. Semmelink lately presented us with a very beautiful specimen (also in spirits), which was collected on the shores of the island of Banda-Neira (Molluccas), and wholly agrees with our Djeddah specimen even as regards the colouration. It

inhabits the shell of a *Bulla ampulla*, which is covered on its outer surface by three Actiniae; it is an adult specimen, as I believe, and larger than that of the Djeddah shores. In consequence of this larger size the two last joints of the third pair of legs on the left side are somewhat differently shaped: the upper margin of the external surface of the penultimate joint, which is finely denticulated in the younger Djeddah specimen, is nearly entire in the individual from Banda-Neira, the teeth being worn out; the last joint or tarsus has a more elongate appearance, being comparatively less broad at its base than in the Djeddah specimen; the teeth of the upper margin of the external surface being also a little worn out. The peduncle of the external antennae in the specimen of Banda-Neira is distinctly longer than the eye-peduncles, (as should be in our species, according to the original description), but in the younger Djeddah individual the antennal peduncles have the same length as the eye-peduncles; I regard these differences as caused by difference in age. With regard to the width of the anterior margin of the carapace, the eye-peduncles in the *adult* Banda-Neira specimen are comparatively shorter than in the *younger* Red Sea individual, though having in both the same *absolute* length: it seems therefore that when our *Pagurus* has attained to the age of the Djeddah specimen the eye-peduncles do no more increase in length, though they become thicker and coarser, when it attains to the adult state. For the rest our specimens are quite similar to each other.

As regards the Japanese *Pagurus asper* de Haan (Fauna Jap. pag. 208, tab XLIX, fig. 4), I think it to be most nearly allied to our *Pagurus varipes*, but distinguished by the outer surface of the penultimate joint of the third pair of legs on the left side being convex; and its upper and under margins not being carinated and denticulated as in *Pag. varipes*. The original specimen of *Pag. asper* F. Jap. has not been found back by me.

Pag. varipes Heller being found in the Red Sea and in the sea of the Moluccas will therefore probably occur also throughout the whole Indian Ocean.

Dimensions of the Banda-Neira specimen :

Width of anterior margin of carapace 11 mm.

Distance from anterior margin to cervical suture 13 mm.

Length of eye-peduncles (basal scales included) $8\frac{1}{2}$ mm.

Length of the larger hand 27 mm.

Length of the tarsus of the third left pair 25 mm.

Araeosternus wieneckii nov. Gen. Nov. Spec.

A new form of the Family of Loricata.

This very interesting new form which I wish to give the name of *Araeosternus* on account of its narrow sternum, belongs without any doubt to the Family of Loricata (Scyllarides, Palinurides). As regards its generic characteristics, it is nearly allied to the genus *Palinurus* Fabr. s. s. (*Palinuri communes* Edw.), but differs so remarkably by the structure of the cephalothorax, the shape of the front and the form of the sternum, that henceforth it must represent a new subfamily equal in value to that of the *Scyllaridae* and *Palinuridae*.

The cephalothorax has an elongate subcylindrical shape; the upper surface has an elongate rectangular form, its greatest breadth, that is found a little behind the cervical groove, being in proportion to the length as 5:8; the cervical groove is found a little behind the middle, the lateral portions of which run downwards and forwards towards the anterior part of the antennary sternum; branchiocardiac grooves very faintly marked; close before and parallel to the curved posterior margin of the upper surface of the cephalothorax occurs a very deep, smooth groove. — The cephalostegite or that part of the surface of the carapace which lies before the cervical groove is convex longitudinally, the omostegite nearly straight; the whole surface however very convex transversily, the lateral

regions of the cephalostegite being concave. Lateral margins curved, those of the omostegite rounded, those of the cephalostegite more sharply defined anteriorly and terminating in an acute extraorbital angle. The convex median part of the cephalostegite passes anteriorly to the broad triangular, a little deflexed front, the concave lateral parts of the cephalostegite on the contrary to the acute external angles of the carapace. The front is separated from these external angles by two deep triangular notches, into which the middle-sized eyes project, and extends nearly as much forwards as do the external angles of the carapace. The carapace bears no spines as in the *Palinuri*, but the whole surface is very closely covered with numerous small transverse tufts of very short yellow hairs, a few longer hairs being scattered among them. The anterior margin of the front and the external margins of the orbital notches are a little denticulate and a small median ridge of a few sharp teeth also occurs on the anterior part of the front. The lateral surfaces of the posterior part of the carapace run vertically downwards, but the rather concave subhepatic regions run obliquely inwards and downwards: the lateral surfaces too are covered with numerous very small tufts of short hairs. The broad triangular front wholly covers the ophthalmic and antennal segments; the antennal segment is narrow and armed with two small compressed spiniform plates, converging a little towards each other.

External antennae quite shaped as in the true *Palinuri* Fabr. (s. s.), the coxocerites and basicerites being wholly coalescent with the epistoma. An antennal scale therefore is wanting too. The ischiocerite or basal joint of the peduncle is armed with a small spine at the external angle, the upper surface posteriorly concave, anteriorly convex, the under surface convex and a little rugose, the internal surface concave and smooth; the anterior margin of the upper surface provided with some yellow hairs. Merocerite or second joint also furnished with a few yellow hairs.

like the carpocerite; terminal filament or procerite a little shorter than the carapace, multiarticulate and provided with long yellow verticillated hairs. Internal antennae situated a little below the external ones, shaped entirely as in *Palinurus* Fabr. (s. s.); the basal joint, that is the longest of all, extends to the middle of the carpocerite of the external antennae; the second and third joints are of equal length, together as long as the basal joint; the two terminal filaments very short, the longer internal multiarticulate, a little shorter than the length of the two terminal joints and hairy on both margins. — Epistome of a transverse rectangular form, the anterior margin widely emarginated in the middle, with a median processus, which presents a narrow small notch; the emarginated part of the margin is dentate, the remaining lateral parts minutely crenulate; external surface of the epistome with many small tufts of minute hairs. — External maxillipedes reaching to the middle of the carpocerite of the external antennae, quite shaped as in *Palinurus* Fabr. s. s., second joint (which corresponds with the basipodite of the ambulatory legs) provided with a slender exopodite, the flagellum of which reaches to the middle of the fourth joint, third joint trapezoidal, longer than broad, with the anterior margin broader than the posterior, and having the inner margin of the narrow internal surface armed with nine or ten sharp teeth, which gradually increase in size anteriorly; internal surfaces of all the joints furnished with numerous long yellow hairs. Sternum having an elongate rectangular form, constituted by five segments, the first or anterior segment being a little less broad than the second, the second, third and fourth segments being nearly equal in breadth, the fifth again very narrow, less broad than the first, with the two sides of its surface reflected a little towards each other. Ambulatory legs all monodactyle, the first pair much thicker and stronger than the others, reaching a little beyond the peduncle of the external antennae; coxopodites inserted on the anterior

margin of the first sternal joint, their internal surfaces touching one another (not separated from each other as in *Palinurus* Fabr.), meropodite scarcely reaching to the anterior margin of the epistome, compressed, with the upper margin acute, the internal surface rather concave and smooth, the external surface convex and covered with numerous small tufts of minute hairs, with longer hairs on the under surface and on the upper margin, with a very small tooth at the distal end of the under margin. Carpopodite very short, with rounded upper margin and rather convex hairy outer and inner surfaces. Propodite a little longer than the preceding joint, having the external and internal surfaces convex and provided with numerous small transverse tufts of hair, the upper margin rounded, the under margin with three or four small conical spines, the distal one being rather the larger, and provided with many long yellow hairs. Dactylopodite as long as the propodite, with the upper margin rounded and smooth, terminating in a strong dark red claw, having the lateral surfaces provided with three longitudinal series of transverse tufts of yellow hairs. The other ambulatory legs gradually decrease in length, and are shaped more or less as in the true *Palinuri*. Coxopodites of the legs of the second pair inserted on the lateral margins of the first and second joint of the sternum, meropodites very much compressed, with acute upper and under margins, having the external surface flattened and the internal rather a little concave; carpopodite cylindrical, with the upper and under margins rounded, propodite nearly twice as long as the carpopodite, compressed, dactylopodite rather long, measuring two thirds of the propodite. External surfaces of all these joints provided with very small tufts of hair, and the upper and under margins with rather long yellow hairs. Legs of the third pair similar to those of the second, though a little shorter. Those of the fourth also similar to the two preceding, but having the meropodites less compressed. Coxopodites of the fifth pair separated from one another

by the narrow fifth segment of the sternum, bearing a conical verge on the under surface; meropodites rather cylindrical, carpopodites comparatively longer than those of the fourth pair, having the distal end of the under margin armed with a small lamellar tooth. Like those of the second pair, the other ambulatory legs are very hairy, with longer yellow hairs on the upper and under margins of the various joints. Abdomen similar to that of *Palinurus* Fabr. s. s., a little longer than the carapace, the upper surfaces (terga) of the joints very convex, not sulcate, and (the tergal facets excepted) provided with numerous very small tufts of short hairs. Pleura of the first segment with a concave external margin and obtuse anterior and external angles. Anterior part of the pleura of the second segment (pleural facet) with rounded anterior margin, separated from the much larger posterior part by a triangular notch, external (posterior) angle acute, external margin denticulated anteriorly. Pleura of the third segment rhomboidal with a nearly straight denticulated external margin, with the external (posterior) angle acute, and the posterior margin nearly straight. Pleura of the fourth and fifth segments nearly similar to one another, quadrangular, with rounded antero-external angle, acute postero-external angle, and a small acute tooth on the middle of the external margin. Pleura of the sixth somite triangular with rounded antero-external margin, the posterior being concave and denticulated. Telson quadrangular, a little longer than broad, the anterior third calcified and provided with numerous small tufts of short hairs as on the terga of the other segments, the remaining part membranous with numerous longitudinal series of very small tufts of short hairs. Posterior margin of the sternum of the first abdominal segment with three teeth, the median being depressed and rather strong; posterior margins of the sterna of the second and third somites with several small lateral teeth and one median which is a little stronger; those of the fourth and fifth segments also with some small acute nearly equal

teeth; sternum of the sixth somite longer (in longitudinal sense) than the preceding sterna, having the median part of the posterior margin armed with three acute teeth on each side of a median notch, the lateral parts being concave and a little denticulate.

Internal surfaces of the pleura a little hairy. Exopodites of the abdominal appendages of the second, third, fourth and fifth segments foliaceous, that of the second being ovoid and pointed, those of the three remaining becoming gradually narrower, all being hairy at both margins; endopodites of the appendages of the second segment a little shorter than the exopodites, linear and hairy; those of the remaining rudimentary. Exopodites and endopodites of the sixth segment large and broad, as in *Palinurus* Fabr. (s. s.) and forming with the telson the tailfin of our crustacean; their upper surfaces covered with numerous longitudinal series of minute tufts of very short hairs, similar to those of the upper surface of the telson.

Dimensions in millimeters:

Length of carapace 82 mm.

Greatest width of it: 50 mm.

Distance of the antero-external angles of the carapace: 28 mm.

Length of abdomen 105 mm.

Length of telson 30 mm.

Length of external antennae 85 mm

Length of internal antennae 50 mm.

Length of anterior legs 110 mm.

Length of sternum 36 mm.

Breadth of middle sternal segment: 18 mm.

The only specimen, a male, was presented to Dr. Wienecke, when visiting the little Rat-Island, near Benkulen (Sumatra) by a man, who said the animal was found by him in the sea, and I allow myself to dedicate it to him who has so greatly enriched our collection of crustacea.

The family of Loricata should be divided henceforth

into three subfamilies Scyllaridae, Palinuridae and Araeosternidae, the last being distinguished by the rectangular narrow sternum and the structure of the elongated sub-cylindrical hairy carapace, which is quite devoid of spines.

According to Dr. T. C. Winkler, the learned palaeontologist of Haarlem, to whom I sent a figure and a short description of our *Araeosternus*, there are no fossil Crustacea, that resemble this interesting form.

Leander pacificus Stimpson.

Four specimens collected on the shores of Amboina were presented to us by Mr. Schorel. Upper margin of the rostrum in two specimens armed with seven, in the two other ones with eight teeth. End of the rostrum provided in three specimens with two small teeth close to each other, immediately behind the apex, in the fourth individual only with one small tooth. Inferior margin with four teeth, in two specimens a fifth very small tooth before them, at a small distance from the apex. This species may be closely allied to *Leander serenus* Heller, but may be recognized by the strongly *serrate* inner margin of the short terminal filament of the internal antennae.

Leander semmelinkii n. sp.

A fine small species, of which the Museum contains no fewer than 56 specimens, lately collected by Mr. Semmelink on the road of Makassar, Celebes, more or less allied to *Leander longicarpus* Stimps. and *Leander modestus* Heller.

Rostrum very slender, longer than the carapace and more or less far extending beyond the end of the antennal scales, the basal half or the basal two thirds of the upper margin *straight* and armed with 8—9 very acute

teeth, the distal end more or less recurvated upwards, *without teeth* and with the point acuminate; the second tooth situated above the eyes, the teeth gradually increasing in size anteriorly and directed strongly forward. Under margin scarcely emarginate at the base, armed with three (very rarely 4 or 5) very strong teeth, the middle tooth situated quite under the foremost tooth of the upper margin, the third therefore at a large distance from the point. The formulæ of the teeth in our 56 specimens are:

$\frac{8}{3}$, 38 specimens; $\frac{9}{3}$, 13 specimens; $\frac{9}{4}$, 1 specimen; $\frac{9}{5}$, 1 specimen; $\frac{11}{4}$, 1 specimen; $\frac{7}{3}$, 2 specimens.

Peduncle of the internal antennae *much shorter* than the antennal scales, reaching to the middle of the second tooth of the under margin of the rostrum. Short terminal filament of the upper antennae extending as far as the end of the rostrum, rather thin, not serrate and the two fifths basal parts of its length united with the long filament. Branchiostegal spine very small, situated quite at the margin of the carapace; carapace quite smooth. External maxillipeds reaching a little beyond the end of the peduncle of the external antennae.

Legs of the first pair reaching to the end of the antennal scales, carpus nearly twice as long as the hands, fingers nearly as long as the palm, a little hairy. Legs of the second pair extending nearly with the whole hand beyond the antennal scales, reaching as far as the end of the rostrum, stronger than those of the first pair. Carpus a little shorter than the hand, but distinctly longer than the palm; fingers straight, closely situated to one another and measuring nearly two thirds of the length of the palm. Other legs very thin, those of the fourth pair reaching to the end of the antennal scales, those of the fifth pair not reaching quite so far. End of the terminal joint armed with three small and two longer spines.

Length of the end of the rostrum to the point of the terminal joint of the abdomen 38 mm.

Leander indicus Heller?

The Museum has lately received two specimens of *Leander* of small size (length with the rostrum included scarcely 25 mm.), which I believe to be young individuals of *L. indicus* Heller (Novara-Reise, pag. 111, taf. X, fig. 7). They differ from the description: 1^o by the dentition of the rostrum 2^o by the relative length of the joints of the second pair of legs. The basal part of the upper margin of the rostrum which extends a good way beyond the antennal scales, in our specimens is *straight*, but the distal half slightly recurvated upwards.

Formulas of both specimens $\frac{13}{9}$ and $\frac{11}{8}$; in the specimen ($\frac{13}{9}$), the whole upper margin is dentate, but in the other the ninth tooth is separated by a small toothless space from the two foremost, that are situated close to the apex. In both specimens the space between the two first teeth is a little larger than between the others, and the second is situated above the eyes. The carpus of the second pair of legs is but little longer than the chela and the thin straight fingers rather a little longer than the cylindrical palm. The claws of the ambulatory legs are *very thin and very long, nearly straight*, and measure nearly two fifths of the length of the tarsi.

Our specimens were collected on the road of Makassar (Celebes) by Mr. Semmelink, together with *Leander semmelinkii*.

Leander serrifer Stimpson.

The Leyden collection contains no fewer than 150 specimens of this species, collected near Amoy (China), which very well agree with Mr. Stimpson's description (Proc. Acad. Philad. 1860, pag. 41), yet present many variations as regards the shape and the number of the teeth of the rostrum. The rostrum generally rather proceeds a little beyond the antennal scales; the upper margin, mostly

quite straight, in some specimens however is a little recurvated upwards at its distal extremity. In all our specimens the distance between the two posterior teeth of the upper margin is a little larger than between the others, the anterior tooth of the upper margin is always more or less remote from the apex, the latter armed on its upper side with one or two very small teeth, very rarely without a tooth. The number of teeth of the upper margin in most specimens amounts to eleven, in some others to twelve, in others again to only ten, but having examined 77 specimens I found only two with *nine* teeth (as described by Stimpson). The under margin is armed with four teeth in 56 out of the 77 specimens, in 12 only with three teeth. Our specimens therefore either present a remarkable variety or Stimpson may perhaps have examined only a few specimens, accidentally armed with nine teeth on the upper and three on the under margin. It may be allowed to quote the formulas of the teeth of these 77 specimens:

$\frac{12+2}{5}$	1 specimen.	$\frac{11+1}{5}$	5 specimens.	$\frac{10+1}{4}$	9 specimens.
$\frac{12+2}{4}$	1 »	$\frac{11+1}{4}$	31 »	$\frac{10+1}{3}$	1 »
$\frac{12+1}{5}$	2 »	$\frac{11+1}{3}$	5 »	$\frac{10+1}{2}$	1 »
$\frac{12+1}{4}$	9 »	$\frac{11+2}{4}$	2 »	$\frac{9+2}{3}$	1 »
$\frac{12+1}{3}$	2 »	$\frac{11+0}{4}$	1 »	$\frac{9+0}{4}$	1 »
$\frac{12+0}{4}$	2 »	$\frac{11+0}{3}$	2 »		
$\frac{12+0}{3}$	1 »				

So that only one individual wholly agrees with the number of the teeth in Stimpson's description; this specimen has a length of 50 mm (rostrum included); the legs of the second pair are 30 mm. long, the wrist extending nearly

in its whole length beyond the end of the antennal scales, being 7 mm. long; the palm $6\frac{1}{2}$ mm, the fingers $3\frac{1}{2}$ mm. long. In other specimens the *chela* of the second pair only extend beyond the antennal scales. The inner margin of the short terminal filament of the internal antennae is not serrate, and the branchiostegal spine is strong and quite situated at the margin of the carapace. This species seems to be proper to the China sea.

Leander longirostris Say.

Palaemon longirostris, Milne Edwards, Hist. Nat. Crust. T. II, pag. 394.

Two fine specimens were collected near the town of Amoy (China).

Formulas of the teeth of the rostrum in these specimens: $\frac{7+3}{8}$ and $\frac{8+2}{7}$.

Branchiostegal spine rather smaller than antennal spine. Short filament of the internal antennae reaching to the end of the rostrum, not serrate, its fourth basal part only united with the other filament. Legs of the first pair not reaching to the end of the antennal scale, those of the second pair reaching with half the palm beyond that scale; wrist of the second pair rather shorter than the arm and shorter than the hand; palm a trifle shorter than carpus, a little tumid, fingers straight as long as the palm. The other legs elongate and a little extending beyond the antennal scale. Length of our specimens (rostrum included) 60 mm; length of rostrum 18 mm. This species is closely allied to *L. serratus* Pennant, but is distinguished by the under margin of the rostrum not being emarginate at its base.

Leander celebensis n. sp.

The Museum has lately received seventeen specimens of an apparently new species of *Leander*, collected together with

Leander semmelinkii n. sp. and many other species of Caridae on the road of Macassar (Celebes), Januari 1880. This new form is closely allied to and has the size of *Leander distans* Heller, but is distinguished by the number of teeth of the rostrum and by the second pair of legs.

Rostrum lanceolate, reaching to the end of the antennal scales, upper margin straight or a little convex, as also the under margin, which is not emarginate at the base; it is $\frac{14-15}{3-4}$ dentate, the teeth of the upper margin acute

directed forwards, extending along the whole margin, distance between the two first twice as large as between the others, the third tooth situated above the eyes, the three or four teeth of the under margin situated in the middle of it, minute and hidden by the hairs of the margin. Carapace smooth, branchiostegal spine small, a little remote from the margin, abdomen as in *Leander semmelinkii*. Peduncles of the internal antennae a little shorter than the antennal scales, short filament of these antennae connected only for a short end with the long filament. External maxillipeds reaching to the second joint of the peduncle of the upper antennae. First pair of legs reaching with the hand beyond the end of the antennal scales, the carpus being nearly twice as long as the hands. Second pair of legs very elongate, stronger than the first pair, reaching with the greater distal half of the wrist beyond the antennal scale; wrist a little shorter than the hand, much longer than the palm, fingers very thin, closely situated to one another, and very slightly longer than the palm. The other ambulatory legs very thin, quite unarmed, with the claws very elongate and nearly straight, those of the last pair extending with half the tarsus beyond the antennal scale.

Length from the tip of rostrum to the end of the abdomen 25 mm.

Length of the legs of the second pair 16 mm., length of the wrist $3\frac{2}{3}$ mm., of the whole hand $4\frac{1}{2}$ mm., of the fingers $2\frac{1}{2}$ mm.

Leander celebensis, is also nearly allied to *Leander natator* M. Edw. (*latirostris* de Haan), but in the latter species the rostrum is elevated in its distal extremity, the teeth in the middle of the upper margin longer than the others, (being nearly similar to one another in *celebensis*), the branchiostegal spine as large as the antennal, the carpus of the legs of the first pair as long as the hand, that of the legs of the second pair also comparatively shorter and the fingers distinctly longer than the palm. In *L. latirostris* the tarsi are spinulose and the claws less elongated than in our new form.

Leander natator M. Edw.

Palaemon natator Milne Edwards, Hist. Nat. Crust. t. II, pag. 393. — Heller, Crustac. des südlichen Europa's, pag. 268. — *Palaemon latirostris*, de Haan, Fauna Japonica, pag. 170, tab. XLV, fig. 12.

The Museum collection contains but a few specimens of this very common pelagic species:

1°. A fine female specimen, collected in the Sargasso-sea by Mr. Ottke.

2°. Another fine specimen, collected by Mr. Kruisinga in the Sargasso-sea, at 23° N. L. and 35° W. L.

3°. A female specimen, found near the island of Waigeoi by Mr. Bernstein.

4°. Several specimens from Japan, preserved in spirits, types of *Palaemon latirostris* de Haan.

A close investigation has shown me that all these specimens wholly agree with one another in all particulars, so that I can state *Pal. latirostris* de Haan to be identical with *Pal. natator* M. Edw. De Haan did not observe the small teeth which are found at the under margin of the rostrum, though hidden by innumerable small hairs: the author of the Fauna Japonica does not appear to have had a specimen of *P. natator* M. Edw. before him, for he says: *Pal. natator* M. Edw. *affinis videtur*.

Leander natator M. Edw. therefore has an extraordinarily wide geographical range, being recorded from the Sargasso-sea (Atlantic Ocean), the Mediterranean, Indian Ocean, Waigeoei (Moluccas) and Japanese seas. It has an equally large distribution as many other pelagic species, as for instance *Nautilograpsus minutus* M. Edw.

According to Mr. S. I. Smith (The Stalk-eyed Crust. Atlant. Coast N. America, pag. 122) *Leander natator* is identical with Say's *Palaemon tenuicornis*; in that case our form should be called *Leander tenuicornis* Kingsley.

Leyden, May 1881.

NOTE XXVIII.

FOUR NEW SPECIES AND A NEW GENUS OF
LONGICORN COLEOPTERA.

DESCRIBED BY

C. RITSEMA Cz.

1. *Aprosictus bilineatus* (v. Voll. in Mus. Lugd. Bat.).
sp. n. ♂.

Length 30 mm., breadth at the shoulders 7,5 mm. — Dark chestnut-brown, approaching to black on the thorax; the elytra testaceous-brown, becoming paler towards the end, narrowly bordered with dark brown; each of them has laterally a dark brown harpoon-shaped figure, which extends from the base down to a little behind the middle; the point of this blotch is directed backwards, the recurved hook inwards: $\left| \begin{array}{l} \vee \\ \vee \end{array} \right|$.

The head and prothorax furnished with scattered ochraceous decumbent hairs; the eyes bordered with a dense ochraceous pubescence; the antennae, with the exception of the two basal joints, densely covered with erect slender pale-coloured hairs; the prothorax provided on the disk with two longitudinal lines of a dense white pubescence. The scutellum densely covered with a pale-ochraceous pubescence. The elytra furnished with scattered white decumbent hairs, which are placed in the punctures. The under surface and legs covered with a long and slender pale-coloured pubescence; the sides of the meso- and metasternum provided with a longitudinal patch of a very dense chalky-white pubescence.

The head and mandibles coarsely punctured; the punctation of the antennary tubers, which, *inter alia*, are

separated by a deep although narrow groove, is much finer. The tip of the mandibles, a transverse spot in front of the antennary tubers and another on the middle of the occiput smooth. The scape of the antennae glossy, sparingly covered with punctures which are however more numerous and more densely set on the foreside; the following joints finely sculptured. The 3rd-10th joints (the 11th is broken off) gradually increasing in length, biflabellate¹⁾ at the tip, which is knotty.

The prothorax slightly constricted at the sides a little behind the middle, rugose in consequence of a coarse, partially confluent, punctuation, leaving however a smooth, more or less cross-shaped patch in the middle and two rounded spots at the base, at the inner side of the white lines.

The elytra attenuated towards the end, strongly punctured as far as the dark brown harpoon-shaped figure extends, nearly impunctate behind this; traces of two or three longitudinal costae may be observed on the basal half; the apex of each elytron bidentate, the teeth separated by a semilunar emargination.

Under surface and legs finely punctured. The metasternum with a deeply impressed longitudinal median line, which does not touch the posterior margin of the mesosternum.

Hab. Waigeoe (Dr. Bernstein).

2. *Anhammus aberrans*, sp. n. ♀.

The species which will here be described differs from *Anhammus* in having the shoulders unarmed, instead of armed with a distinct tooth; moreover the elytra are scarcely narrowed towards the apex, and the cicatrix of the scape of the antennae is considerably narrower than in

1) As these flabellae are injured in the unique specimen sent to the Museum, nothing can be said of their length.

Dalenii. As it is however a Monohammid ¹⁾ with declivous mesosternum (neither produced nor tuberculated), with perpendicular (not transverse) lower lobes of the eyes, and with the prothorax armed at the sides *before the middle* (although not so far forwards as in *Dalenii*) with a strongly developed acute spine, whereas the antennae are neither fringed nor ciliated and the femora and tibiae are not compressed, I do not hesitate to bring this species as a somewhat aberrant one to the genus *Anhammus* Thoms.

Length 38 mm., that of the antennae 53 mm.; breadth at the shoulders 6 mm. — Black, with the palpi (the apical half of the last joint excepted), the 3rd and following joints of the antennae, the tibiae and the abdomen chestnut-brown, the apex of the tibiae blackish. Covered with a close dark fulvous pubescence, especially on the under surface; on the posterior portion of the head it is coal-black; on the tarsi the pubescence has a somewhat greyish tinge, and on the apex of the 4th-8th as well as on the entire 9th-11th joints of the antennae (except on the extreme tip of the apical joint where it is ashy) the pubescence is blackish. Moreover the antennae and tibiae have a few scattered pale coloured erect hairs. The lateral spines and the granules of the thorax, the middle of the scutellum, and the granules and surrounding parts of the punctures of the elytra are destitute of pubescence; the naked portions round the punctures irregularly confluent.

The head slightly rugose in front and sparingly punctured; a slightly impressed line extending from the anterior margin of the clypeus up to the prothorax. The scape of the antennae densely covered with very minute punctures intermixed with larger ones.

The prothorax with one anterior and two posterior not very distinct transverse grooves; the disk between the

1) See: Lacordaire, *Genera des Coléoptères*. Suites à Buffon. tom. IX. p. 301.

grooves provided with a glabrous irregular longitudinal median line, with punctures which are transversely confluent towards the middle, and posteriorly with a few glabrous granules; moreover a few similar granules may be observed behind the lateral spines, which are obliquely directed upwards. The scutellum of a somewhat elongate triangular shape, rounded at the apex; the naked middle transversely striated.

The elytra covered at the base and shoulders with numerous black glossy granules, arranged in more or less regular longitudinal rows, which laterally extend almost to the middle of the length of the elytra; the granules are followed up by irregular and shallow punctures, very uniformly dispersed over the remaining portion of the elytra.

Hab. Borneo.

I owe the described specimen to the kindness of Mr. M. 's Gravesande Guicherit, who at different times has already enriched the Leyden Museum with valuable insects, viz: *Paussus Andreeae*, *Cyclommatus faunicolor*, *Ditomoderus mirabilis*, *Granida albolineata*, *Catorantha purpurascens*, etc.

3. *Nemophas Rosenberghii* (v. Voll. in Mus. Lugd. Bat.),
sp. n. ♂.

Length 31-40 mm. — Black, with dark metallic-green elytra. Head, prothorax (with the exception of the lateral spines), scutellum and body beneath covered with a dense paleochreous pubescence; on the legs and the scape of the antennae the pubescence is very delicate and of the same colour. The elytra with two broad, somewhat irregular bands (one before, the other behind the middle) and some irregular spots on the naked regions especially near the base and apex. Both bands and spots are formed by a similar pubescence as that which covers the thorax.

The head very minutely chagreened and sparingly punctured (in fresh specimens the sculpture is hidden by the

pubescence), provided with an impressed median line, extending from the anterior margin of the clypeus up to the prothorax. The scape of the antennae sculptured in a similar manner as the head.

The prothorax with one anterior and two posterior distinct transverse grooves, the anterior one bent backwards in the middle, the posterior ones straight. The naked lateral spines obliquely directed upwards. The scutellum triangular, rounded at the apex.

The elytra with a few granules at the base and shoulders, followed up by deeply impressed punctures, which however become less and less marked towards the apex.

Legs and antennae delicately sculptured.

Captured at Toelabollo (North Celebes) by Baron von Rosenberg, whose name was attached to the species by the late Dr. Snellen van Vollenhoven.

Dolichoprosopus, g. n.

Allied to *Nemophas* and *Iothocera* of which it has the general appearance. It differs however from the first by the declivous mesosternum (which is neither produced nor tuberculated), by the shape of the lower lobes of the eyes (which are considerably more elongated) and by that of the face (which is much higher than broad between the eyes). Moreover the scape of the antennae is of a more regular sub-conical shape, not angularly incrassate at the tip, and the transverse grooves on the prothorax are less distinct.

From *Iothocera*, with which it has the declivous mesosternum in common, it differs by the more elongate lower lobes of the eyes and face, by the straight thoracical spines, by the pubescent, not granulated shoulders, by the broadly rounded apices of the elytra, etc.

4. *Dolichoprosopus maculatus*, sp. n. ♀.

Length 40 mm., breadth at the shoulders 12 mm. — Black, covered all over with a short and extremely dense pubescence, which is of a mouse-grey color on the head,

antennae, under surface and legs, chalky-white on the pronotum, and fulvous on the elytra; each of the latter however provided with four large rounded dirty-white spots and several small ones irregularly dispersed between them; the large spots are arranged in the following manner: one on the middle of the length of the elytra, neither touching the suture nor the lateral margin, two other at about equal distance from the base (one near the suture, the other near the lateral margin), the fourth between the median one and the apex, neither touching the suture nor the lateral margin. The sides of the metasternum and abdomen indistinctly spotted with fulvous. The antennae blackish towards the end. The extreme front- and basal-margins of the pronotum as well as the tip of the lateral spines naked and glossy.

The head in front much higher than broad between the eyes, sparingly punctured, and provided with a smooth line extending from the anterior margin of the clypeus up to the prothorax; a glabrous and glossy narrow-ovate spot between the antennary tubers. The scape of the antennae sub-conical, about two thirds of the length of the third joint; the cicatrix very distinct and closed; the 3rd-10th joints slightly decreasing in length, the 11th as long as the 7th. The pronotum with two obsolete transverse grooves, one anteriorly, the other near the base; the disk with a few glabrous points disposed in a curved line between the lateral spines, and some other similar points behind the spines. The scutellum triangular, broadly rounded at the apex.

The elytra sparsely punctured, without granules, not narrowed towards the apex where they are broadly rounded.

The mesosternum declivous, neither produced nor tuberculated. The pygidium and last ventral segment broadly truncated posteriorly.

Hab. Halmahera.

Leyden Museum, May 1881.

NOTE XXIX.

THREE NEW SPECIES OF SUMATRAN LONGICORN
COLEOPTERA FROM
THE COLLECTIONS OF THE SUMATRA-EXPEDITION.

DESCRIBED BY

C. RITSEMA Cz.1. *Aegosoma bicoloripes*, sp. n. ♀.

A very distinct species, easily recognizable by its bicoloured legs (yellow and pitchy) and by the rough sculpture of the elytra (very uniformly granulated over the whole surface).

Length 33 mm., that of the antennae 30 mm.; breadth at the shoulders 8 mm. — Covered with a pale golden-yellow dust-like pubescence; on the upper lip and metasternum the pubescence is longer and, on the latter, sericeous; the second and following joints of the antennae and the tarsi are almost naked.

The head, the hind part of the antennae (the fore side of the extreme apex of the 3rd and following joints inclusive), the prothorax, the edges of the elytra, the hind part of the femora, the knees, the inner half of the tibiae and the posterior half of the ventral segments dark brown or pitchy; the fore side of the antennae and the tarsi bright chestnut-brown; the elytra, the metasternum, the foreside of the femora and the basal half of the ventral

segments testaceous-brown; the outer half of the tibiae yellow.

The head with a median smooth line, extending from the basal margin of the clypeus up to the prothorax; the lateral lobes of the clypeus, the space between the antennae and between the upper lobes of the eyes covered with small warts; moreover a few similar warts may be observed behind the upper lobes of the eyes and on the under surface of the head. The mandibles, with the exception of the smooth and glossy tips and inner edge, coarsely sculptured. The eyes strongly emarginated, less prominent than in *Aeg. marginale* Fabr. and their upper lobes narrower. The scape of the antennae without gloss, but covered with small glossy warts; the 3rd-6th joints subshining, irregularly covered with punctures, which now and then are confluent and leave smooth spaces between them; the 7th and following joints opaque in consequence of a very dense and fine punctuation; the 3rd joint twice as long as the 4th; the 4th-7th gradually decreasing in length, the four apical ones about equal in length to one another, strongly depressed, slightly dilated, and sharply edged anteriorly and posteriorly; the last joint has a somewhat elongate ovate shape and is obtusely rounded at the apex.

The prothorax slightly transverse and narrowed towards the front margin; the sides trisinnate, the basal margin bisinuate and strongly upturned; the disk with an indistinct, median longitudinal line, and, on the anterior half, with some small black warts; a tooth-like protruding fold may be observed at the sides just behind the anterior margin. The scutellum triangular, with curvilinear sides and a trace of a longitudinal median line.

The elytra slightly constricted behind the shoulders, further on slightly enlarged, and again although inconspicuously constricted a little before the apex, which is broadly rounded exteriorly and sharply spined at the suture. They are uniformly covered with naked warts, which are somewhat larger and of a darker colour on the costae, especially on the basal portion of the inner one.

The metasternum (which is provided with a smooth impressed median line), the ventral segments, the fore side of the femora and the inner half of the tibiae covered with a fine but extremely dense punctuation, that on the hind part of the femora, outer half of the tibiae and on the tarsi is very sparse.

The legs are slender and compressed.

The described specimen was captured by Mr. A. L. van Hasselt in May 1878 in the District of Rawas.

2. *Callichroma* (an n. g.) *testaceipennis*, sp. n. ♂.

This insect appears to be allied to *Aromia* as well as to *Callichroma*. It has the inter-antennary ridge and the mandibles shaped as in *Aromia* but the general appearance of *Callichroma*. From both genera it differs by its stout and shorter antennae (extending only a little beyond the apex of the elytra in the male), by its strongly compressed and more elongate posterior metatarsus (almost as long as the following joints taken together) etc. As however the genera of the Callichrominae are as yet only very unsatisfactorily defined, I hesitate to augment the confusion by establishing a new genus for this species, which moreover is easy to recognize.

Length 33 mm., that of the antennae 35 mm.; breadth at the shoulders 9,5 mm. — Metallic green, with shades of cyaneous especially on the base of the antennae and on the legs; the elytra yellowish-testaceous, with (perhaps accidentally) a somewhat reddish tinge on the basal fourth, their apices narrowly bordered with dark brown; the front margin of the clypeus, the upper lip, and the tips, inner edges and under surface of the mandibles black; the fore side of the antennae beginning with the tip of the 3rd joint dull black; the hind side of the 5th and following joints with shades of blue or green which however gradually disappear towards the end of the antennae. Glabrous, with the exception of the under surface of the thorax

and abdomen, which is covered with a pale sericeous pubescence.

Head irregularly punctured, the posterior half of the under surface transversely wrinkled; the mandibles shaped as in the genus *Aromia* but stouter and more strongly curved; their tips, inner edges and under surface smooth, very glossy; the antennae a little longer than the body, stout; the antennary tubers pointed at the top, separated by a deep emargination, which shows at its bottom a narrow but deep groove ending on the face in a smooth transverse deep impression, and prolonged backwards as an impressed line which is interrupted on the middle of the vertex; in the emargination of the eyes the head is deeply excavated; the three basal joints of the antennae finely punctured; the scape about as long as the 3rd joint with a deep and well defined smooth excavation on the under surface, the 3rd joint not quite $1\frac{1}{2}$ as long as the 4th, longitudinally furrowed beneath; the 4th joint a little shorter than each of the three following joints (which are equal in length), as long as the 8th which is a little longer than the 9th or 10th; the apical (11th) joint a little longer than the 5th, slightly sinuated, subdivided at two-thirds of its length; the fore side of the 5th-10th joints more or less prolonged at the tip.

The prothorax very irregularly punctured, about as long as broad at the base, armed with a pointed triangular tubercle on the middle of the sides, the anterior margin bent forward in the middle, the posterior margin straight; the disk raised, with two faint curved elevations: (); the punctuation between these elevations very dense. The scutellum of a triangular shape, smooth, impunctate, with a longitudinal median line; it is impressed with upturned sides.

The elytra at the base much broader than the thorax, regularly narrowed towards the end. They are opaque in consequence of a very dense and fine sculpture, each of them provided with three narrow slightly raised costae,

and somewhat obliquely rounded at the apex. The shoulders are broadly rounded, not at all produced which gives them the appearance of being placed a little backwards.

The pro- and mesosternum rounded, not tuberculated. The femora and tibiae, with the exception of the slightly curved tibiae of the forelegs compressed, the apical half of the anterior and intermediate femora swollen; the posterior femora slightly curved, extending to the apex of the elytra; the strongly compressed posterior tibiae a little shorter than the femora, straight; the posterior metatarsus strongly compressed, almost as long as the following joints taken together. The femora strongly punctured, on the tibiae the punctuation is finer. Six ventral segments; the first large, the 5th and 6th slightly emarginated posteriorly.

The metasternum (which is provided with a slightly raised line at the bottom of a longitudinal median impression) and the ventral segments densely covered with a fine punctuation.

Captured by Mr. A. L. van Hasselt in June 1878 in the Highlands of Palembang on the road between Rawas and Lebong.

3. *Monohammus Versteegii*, sp. n. ♂.

Length 31 mm., that of the antennae 100 mm.; breadth at the shoulders 5 mm. — Black, clothed all over with a very dense bluish-white tomentum, which hides the sculpture but leaves some smooth dots on the prothorax, elytra and metasternum. On the antennae, which are ciliated on the under surface with black hairs, the white tomentum is gradually replaced by a black one, beginning with the apical third of the 3rd joint. Moreover a black pubescence may be observed on the under surface of the tarsi and anterior tibiae, and on the apical third of the intermediate and posterior tibiae, both inside and outside.

On the prothorax the lateral spines, an ovate small spot on the middle of the disk, two round dots a little inwardly

from the base of the spines, and a few small points are naked. On the elytra a few similar dots are present along the suture and lateral margins; along the suture they are placed in a single longitudinal row, along the lateral margins however in *two alternating* longitudinal rows. On the under surface three pairs of naked dots may be observed: the first on the sides of the prosternum, the second in the anterior external angles of the metathoracical episterni, the third on the middle of the lateral margins of the metasternum; moreover the metasternum shows a naked longitudinal impressed line on the middle.

The face transverse, the lower lobes of the eyes a little higher than broad, the front triangularly emarginated between the antennary tubers; a fine naked line from the middle of the anterior margin of the clypeus ending a little before the anterior margin of the prothorax. The scape of the antennae sub-cylindrical, as long as two thirds of the length of the 3rd joint, the cicatrix sharply defined and closed; the 4th joint a little shorter than the 3rd; the 5th-10th almost inconspicuously increasing in length, the apical (11th) joint a little more than twice the length of the 10th, slightly curved near the apex.

The prothorax a little broader than long, with a widely interrupted transverse linear groove a little behind the front margin, another curved faint one a little more backwards, and two narrow ones before the basal margin; the latter as well as the basal grooves slightly bisinuate; the lateral spines are strong and acute and obliquely directed upwards. The scutellum triangular, broadly rounded at the tip.

The elytra at the base much broader than the prothorax, the shoulders and apices rounded.

The pro- and mesosternum rounded, neither produced nor tuberculated.

The described specimen was captured on Mount Barisan (\pm 2000 feet) in the District of Singkarak ¹⁾.

1) The female sex of this species is represented in the entomological col-

I have named this species after Mr. W. F. Versteeg one of the Members of the Committee for the Scientific Sumatra-Expedition.

Leyden Museum, May 1881.

lections of the Zoological Garden at Amsterdam by a specimen which is labeled: „*Monohammus* nov. spec., Himalaya”. It is broader than the male, has shorter antennae which are almost destitute of ciliae, whereas the naked dots are somewhat larger and a little more numerous on the elytra.

NOTE XXX.

DESCRIPTION OF A NEW SPECIES OF THE DYNASTID GENUS TRICHOGOMPHUS, BURM.

BY

C. RITSEMA Cz.*Trichogomphus Semmelinkii*, sp. n. ♂.

Appears to be allied to *Trichogomphus Martabani* Guér.¹⁾ from the coast of Martaban and the frontiers of Sylhet, by its punctate elytra, but is undoubtedly distinct, the cephalic horn being provided on the hinder surface of its apical half with a strongly compressed protuberance, the anterior margin of the prothorax being only inconspicuously emarginated behind the cephalic horn, the upper surface of the prothorax being regularly excavated and not obliquely raised towards the base (see Guérin's figure), which gives a very different aspect to the prothorax when seen sideways.

Length 45—55 mm. — Upper surface, tibiae and tarsi black; under surface, femora and club of the antennae dark chestnut-brown; the pubescence of the under surface, legs and antennae reddish.

The anterior margin of the clypeus is straight with

1) *Voyage aux Indes-Orientales* etc., par Ch. Bélanger. Zoologie (1834) p. 484. Insectes pl. 1, fig. 3 (*Oryctes*). — Burmeister, *Handbuch der Entomologie*. Bd. V (1847) S. 220, N^o. 2. — Dohrn, *Stettin. Entom. Zeitung* Jahrg 26 (1865) S. 371.

rounded lateral angles in two of my three specimens; in my third specimen it is distinctly emarginate. The cephalic horn curved backwards, covered with a punctuation which is fine and dispersed on the sides, coarser and denser set on the front surface especially towards the base; the hinder surface of its apical half is provided with a strongly compressed protuberance.

The prothorax margined, narrowed before and behind, more strongly however at the anterior half; the anterior lateral angles protruding, sub-acute; the posterior lateral angles rounded; the anterior margin inconspicuously emarginated behind the cephalic horn; the posterior margin tri-sinuated, the median lobe not strongly developed backwards. The anterior two-thirds of the disk of the thorax excavated and surmounted by a strongly developed basal protuberance, which is obliquely directed forwards, and semilunarily emarginated at the top; two compressed triangular lateral protuberances may be observed at a distance of one third of the length of the prothorax from the anterior margin; the sides of the pronotum and the lateral margins of the basal protuberance coarsely sculptured; the remaining portion finely and dispersedly punctured; the bottom of the excavation very glossy, almost impunctate. The scutellum large, triangular, entirely visible, densely punctured except on the sides and apex where it is impunctate.

The elytra are rather densely covered with large, shallow punctures, which are bordered by a raised line, and intermixed with fine and deeply impressed punctures; the margined punctures, many of which have a raised central point, become smaller and less distinct near the apex; the shoulders and apices of the elytra are only provided with small deeply impressed punctures; each elytron shows three flat, almost impunctate oblique costae, marked by two rows of margined punctures and disappearing towards the end; the outer costa is very indistinct and short¹⁾.

1) In the largest of my specimens some faint wrinkles across the suture, and a faint longitudinal impression on the outside of the costae may be observed.

The pygidium sub-opaque in consequence of a fine sculpture; its central portion glossy, with a few punctures.

Under surface glossy, indistinctly punctured. A streak on the metasternum behind the intermediate femora opaque.

Three male specimens: one from Manipa, a small island between Buru and Ceram (Hoedt), a second (the largest one) from Wahaai, North Ceram (Moens), the third from East Ceram (Semmelink).

I have much pleasure in dedicating this species to Mr. J. Semmelink to whom the Leyden Museum is indebted for a large number of zoological objects from different localities of the Malayan Archipelago.

Leyden Museum, June 1881.

NOTE XXXI.

A NEW SPECIES OF THE GENUS RAWASIA, ROEL.
(ECELONERIDES, FAM. ANTHRIBIDAE).

DESCRIBED BY

W. ROELOFS.*Rawasia Diardi*, sp. n. ♂.

Minus elongatus, rufo-brunneus, pilis luteis tectus, interstitiis alternis elytrorum pilis luteis atrisque maculatis; prothorace vage, disperse punctato, antennis nigris, albo-spinosis, clava nigra, articulo ultimo brunneo. — Long. 15 mm.

Closely allied to *Rawasia Ritsemæ* Roel. ¹⁾, almost similar in colour, a little larger and of a less elongate shape. Reddish-brown (as far as the dense pubescence permits to judge of the colour of the derm), the sides and under surface of the rostrum and the antennae black. The upper surface densely clothed with a yellowish-grey pubescence, and moreover provided with short erect black hairs.

The rostrum similarly shaped as in the allied species; the punctuation which appears to be less coarse, is hidden by the dense pubescence. A narrow longitudinal smooth line on the middle. The sides between the antennae and the eyes are strongly punctured, behind the eyes glossy black. The eyes less prominent than in the allied species. The antennae as in the allied species, the apical joint of the club brownish.

The prothorax slightly elongated, the sides rather straight, gradually bent inwards anteriorly. The upper surface (es-

1) *Notes from the Leyden Museum*. vol. II. p. 204.

pecially before the basal margin) flattened in the middle, the punctuation fine and dispersed. The yellowish-grey pubescence is here and there of a paler colour, and on the anterior half a paler median line and four paler dots may be observed. The scutellum is very small, hardly visible.

The elytra are proportionally shorter and broader than in the allied species, the shoulders better visible and rounded. The elytra are provided with rows of punctures. The interstices are equal in width and not raised ¹⁾, those between the alternate striae (commencing with the interstice between the suture and the first row of punctures) are decorated with black and pale yellow spots. The black spots are less elongate than in the allied species and the elytra have no transverse band of paler hairs behind the middle.

Under surface not very densely clothed with yellowish-grey hairs, and provided with shallow and rather dispersed punctures. The legs are similar to those of the allied species. The black ring at the apex of the tibiae is narrower at the under surface and is absent on the forelegs.

Hab. Buitenzorg, West-Java (Diard). Type specimen in the Leyden Museum.

Although I have only a single specimen (♂) at my disposal, I have nevertheless described the insect, because it belongs to a remarkable genus, which was unknown up to the time that I described the Sumatran species. Other species will probably be discovered by further investigations.

Brussels, May 1881.

1) In *Rawasia Ritsemae* Roel. the interstices are alternately narrower and appear to be slightly convex. The narrower interstices commence with that which is situated between the suture and the first row of punctures and this is the narrowest of all. — In *Rawasia Diardi* Roel. on the contrary this interstice is decidedly of the same width as all the others. The blackish brown spots being less elongate, the colour of the upper surface of the insect appears somewhat paler.

NOTE XXXII.

DUAE NOVAE STAPHYLINIDAE EX INDIA
ORIENTALI (SUMATRA).

DESCRIPTAE AB

A. FAUVEL.1. *Xantholinus cicatricosus*, sp. n.

Ad sectionem *fulgidi* referendus, prope *nasutum* Harold (africanum) collocandus. Multo major et robustior. Elongatus, parallelus, nitidissimus, elytris paulo minus, convexus; niger, antennis pedibusque nigro-piceis, palpis tarsisque rufescentibus, elytris rufis, segmentorum 6 et 7 apice rufo-testaceo; capite thoraceque pilis parvis nigris flavisque hirsutulis, elytris abdomineque longius parce flavo pilosis; antennis robustis, capitis longitudine, circa apicem haud incrassatis, articulis 5 primis glabriculis, nitidis, 1^o sex sequentes longitudine æquante, arcuato, 2—5 punctatis, 3^o 2^o paulo longiore, 6—10 æqualibus, fortiter transversis, 11^o breviter conico; capite crasso, convexo, subquadrato, lateribus parallelis, basi truncato, angulis posticis dentatis, inter antenas breviter profunde impresso, medio inter foveas subnasuto, polito, toto profunde sulcatim longitudinaliter cicatricoso, lineis quinque longitudinalibus irregulariter lævibus, altera media, duabus extus disco parva obliquis, duabus aliis post-ocularibus, lateribus crebrius minus grosse, subtus parce punctato; oculis magnis, proeminentibus; thorace capitis longitudine, subtrapezoidali, convexo, ad angulos anticos rotundatos capitis latitudine, dein usque ad angulos posticos etiam rotundatos parum angustato, disco antice posticeque utrin-

que parum profunde sulcato, sulcis 4 vel 5-punctatis, margine antico et summo latere cicatricoso, prope angulum anticum fovea impresso, lateribus biserialim circiter 12-, extus sulculos basales circiter 10-punctato, sulculo subbasali tenuissimo breviter impresso; margine inflexo ante medium carina flexuosa diviso, plaga postica parum punctata; scutello circiter 10-punctulato, triangulariter obtuso; elytris thorace paulo longioribus, paulo latioribus, disco toto sat dense punctis grossis regulariter, margine inflexo densius minus fortiter, serie intrahumerali magis regulari, spatio ab humeris ad angulum posticum parum elevato, lævi, abdomine vix perspicue cuprino-nigro, utrinque fortiter dense punctato, segmentis dorso medio anguste lævibus, duobus apicalibus paulo minus punctatis. — Long. 20 mill.

Lebong; mense maio. Unicus.

2. *Euryporus argentatus*, sp. n.

Forma *Aleocharæ fuscipedis*, sed triplo major; pube brevi, argenteola supra caput, humeros, scutelli apicem, segmentorum 2 et 6 apicem, corpus subtus fere totum pedesque insigniter vestitus; niger, opacus, abdomine sat nitido; palpis, antennarum articulis 2 primis, tibiis anticis, tarsis, segmento 6^o apicē 7^o que rufescentibus; antennis summo apice dilutioribus, robustis, articulo 1^o duobus sequentibus longitudine æquali, 3^o 2^o paulo longiore, 4^o quadrato, 5—10 gradatim paulo latioribus et brevioribus, 7—10 fortiter transversis, 11^o vix longiore, oblique truncato; capite parvo, transversim subquadrato, basi profunde sinuato, lateribus post oculos magnos, prosilientes, parallelis, creberrime rugosule, disco medio vix minus punctato; labri margine antico lævi, nitido; collo angusto, æque ac caput punctato; thorace planiusculo, suborbiculari, capite tertia parte latiore, angulis omnibus maxime rotundis, capite subtilius densiusque rugose punctato, linea longitudinali disco vix perspicue elevata, dense subtiliter

fusco pubescente; scutello magno, creberrime subtilissime strigosulo-punctato; elytris subquadratis, thorace vix rugosius punctatis, vix longius fusco pubescentibus; abdomine crasso, elytris vix angustiore, fusco longius pubescente, pube argentea segmenti secundi fusco interrupta, toto crebre sat fortiter, segmento 6^o apice creberrime subtiliter punctato; ♂ segmento 7^o apice subtus late vix emarginato. — Long. 12 mill.

Moeara Laboe; mense novembri. Unicus ♂.

Obs. Collo angusto, capite postice fortiter coarctato, punctura corporis et facie *Euryporo puncticollis* Er. (americano) potius quam speciebus europæis vicinus, licet omnino distinctus et ad sectionem genuinam certe referendus.

Caen, mense Maio 1881.

NOTE XXXIII.

ON GYMNURA CANDIDA.

BY

Dr. F. A. JENTINK.

June 1881.

It is a fact long since known to Naturalists, that there are among the *Gymnura rafflesii*-specimens many albinos, but a few weeks ago visiting several Musea of Natural History, I was greatly surprised to find that all these albino-specimens were from Borneo, and that none of the collections I examined contained either a so called albino from Sumatra or from Malacca, or a dark colored specimen from Borneo. Professor Schlegel in his book entitled "Handleiding tot de beoefening der Dierkunde, 1857, Deel I", says "In the Borneo-specimens of *Gymnura rafflesii* the "whole body is variegated with white", and Dr. Günther, P. Z. S. L. 1876, p. 425, speaking from the Borneo-form, which he distinguished s. n. *Gymnura rafflesii*, var: *candida*, states, »all the specimens received from Labuan differ from the typical form in being of a white colour, "only a part of the longest and strongest hairs on the "trunk being black. The head, legs and tail are pure "white. As no structural differences can be discovered "either in the skull, or dentition, or any other part of "the body, I consider it sufficient to distinguish this form "as a merely local variety."

As I returned home I examined what we possess in our collection of the named species and found two dark colored specimens, one from Sumatra, Padang-bessie,

collected by the late S. Müller, the other from Malacca and an albino-specimen from Borneo, many years ago sent over by the late Dr. Schwaner; and further two complete skeletons, one of the Sumatra-specimen, the other of the Borneo-individual. In comparing these skeletons I soon saw that they presented many differences and now, having closely studied and compared them, I do not hesitate to say that we have here to do with two distinct species. I will shortly explain the differences, which I have observed. In the skull of the Borneo-specimen the molars and canines have not yet attained their full growth, while in the other all the teeth are well developed, and although the former must for this reason be regarded as a younger individual, it is nevertheless larger and its skeleton is much stouter in all its forms and dimensions. In both of them the number of vertebra and costae is the same. viz: 15 dorsales with 15 ribs, 5 lumbares, 5 sacrales and 26 caudales. The skull of the Borneo-specimen is of a more elongate form, and less broad than in the Sumatra-specimen.

	Sumatra-sp.	Borneo-sp.
	m.m.	m.m.
Length of skull	75	79.5
Width between jugalia	38	36.5
Distance between the foremost corner of the eyehole and the first incisor	33.5	37

In the Sumatra-specimen the palate is more excavated, but shorter than in the other one, measuring in the latter 49 m.m. and in the former 46 m.m. As I have already mentioned the teeth in the Borneo-skull are not wholly developed, and indeed instead of each foremost upper incisor there are two teeth, of which the hindest is the smaller, and instead of the large canines I see in each upper jaw two smaller teeth, and in each lower a single tooth which is but a little larger than the incisors. The second molars in both jaws also are not yet fullgrown. But the teeth in general and especially the molars are much stouter, larger and broader than in the Sumatra-skull.

The whole upper molar series of the Borneo-specimen measures 27 m.m., while those parts in the Sumatra-specimen measure 23 m.m., and in the lower jaw respectively 28 m.m. and 24 m.m. In the upper jaw of the Sumatra-skull the second and third incisors are crowded together, both in the Borneo-skull they show a small interval. For the rest the form of the teeth is the same in both skulls.

There are still more points in which the very parts of the skulls and skeletons differ, for instance the shoulder-blades and pelvis-bones, but as easily as such differences are to be seen by direct comparison as difficult it is to explain them without exact figures and large and extensive descriptions. Moreover I believe that what I have said, will suffice to convince Naturalists that the Borneo form is a good and distinct species. I propose to call this species "*candida*", a name given by Dr. Günther, vide antea l. c.

Externally I find the following characters; *Gymnura candida* is pure white, there are only a few hairs on the back which have black tips; generally the hairs are shorter and scarcer; the head is more elongate and the whole habitus is stouter.

I do not doubt that more characters are to be found if fresh specimens are examined and compared.

7209. Dec. 3. 1881

NOTES

FROM THE

LEYDEN MUSEUM

EDITED

BY

Prof. H. SCHLEGEL

Director of the Museum.

VOL. III.

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N<sup>o</sup>. 4. October 1881.  
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LEYDEN
E. J. BRILL.

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NOTE XXXIV.

ON THE GENUS RHEITHROSCIURUS Gray.

BY

Dr. F. A. JENTINK.

July 1881.

As I wrote my paper on *Sciurus (Rheithrosciurus) microtis*, see Notes from the Leyden Museum, Part I, 1879, p. 40, I knew *Rheithrosciurus macrotis* only from the both short annotations of the late Gray about that Squirrel. I here verbally copie his descriptions: Proc. Zool. Soc. Lond. 1856, p. 341, pl. XLVI, he writes: »Among the specimens of animals which the British Museum has lately received from Mr. Wallace from Sarawak, is a large, well-marked species of Squirrel, particular for having very large, longish pencilled ears like the European species, with a broad white streak on the upper part of each side, and a very broad full tail, grisled, with large white tips to the hairs. *Sciurus macrotis*. Ears large, with large pencil of elongate hairs. Dark chestnut-brown, very minutely grisled with pale tips to the hairs. Rump, outside of thighs and base of tail redder; point of thighs bright bay; feet blackish; upper part of the side with a broad pale streak; cheeks and inner side of legs paler; chin, throat, and beneath white; tail very broad, with very long white-tipped hairs. Length 13, tail 11 = 24 inches. Hab. Sarawak (Mr. Wallace).” — and: Ann. and

Mag. of Nat. Hist. 1867, p. 271, we read: »The front edge of the cutting-teeth broad, rounded, closely longitudinally grooved. *Rheithrosciurus* nov. gen. Head large, compressed, short; ears large, with a pencil of elongated hairs at the tip; cutting-teeth broad, rounded in front and closely longitudinally grooved. The limbs free; feet large, strong. Tail as long as the body and head, very thick, clavate, covered with long flaccid hairs. The grooving of the teeth is a peculiarity not observed in any other Sciuridae. *Rheithrosciurus macrotis*. Brown, very minutely punctulated; throat and beneath white; lateral streaks broad, yellowish; front of thighs bay. Tail blackish, whitish washed. Hab. Sarawak (Wallace). Type in B. M.' — In my above mentioned paper I already briefly showed that these descriptions are highly short and that they do not agree the one with the other. As I often before had seen Squirrels with grooved upper cutting-teeth, that is to say, where those teeth are provided each with one or two grooves and while Gray in his first description entirely had overlooked this character, I thought that his words »cutting-teeth closely longitudinally grooved" in his second note should be understood as only relating the upper ones, for squirrels with grooved lower cutting-teeth were not known. In my opinion now the grooving of the upper cutting-teeth in squirrels has no generic value, but my Saleyer squirrel presenting that character, I placed the latter in the neighborhood of Gray's squirrel, but with Gray's generic title *Rheithrosciurus* in Parenthesi. In doing so I only intended to fix the attention of the readers on the always excellent character of the grooved cutting-teeth in distinguishing species.

Anderson in his »Yunnan-Expedition" says not a single word about the grooved character of the incisors, and he describes the squirrel as follows: »The head is large, compressed and short. The ears are large with a pencil of elongated hairs at their tips, the feet are large and strong and the sides of the animal are laterally banded. The

general colour of the animal is dark-nutbrown, very minutely punctulated; the hind quarter, including the base of the tail and the outside of the fore- and hindlimbs bright bay; the feet blackish. There is a brownish band from the axilla to the groin, with a yellowish white band about it. The cheeks and inner sides of the limbs are pale brownish, grizzled and with long white tips to the hairs. Habitat. Sarawak. Borneo." Afterwards my friend Trouessart in his *Catalogue des Mammifères vivants et fossiles* 1880 p. 69 (12), united my *microtis* with Gray's *macrotis* in the genus *Rheithrosciurus*. Thereupon I wrote to Trouessart that I did not accept that genus, as there were still more squirrels which show the same character, but for the rest belong to the most different groups and I shortly explained why I had placed my squirrel in the neighborhood of Gray's species. But I hardly can express my astonishment as I saw in the Paris Museum and afterwards in the British Museum specimens of *Rheithrosciurus macrotis*! Indeed it is the most splendid squirrel that I ever saw. The coloring of the body generally resembles that of *Sciurus prevoatii*; like in that species each side is ornated with a broad white band. But the ears are longer than in any other squirrel, viz: 30 mm., they are embellished with a very long tuft measuring 45 mm., the whole ear with pencil also measures about 75 mm. The tail is very bushy and resembles that organ in *Chiromys madagascariensis*; its length is about 280 mm. without tuft, while it measures the tuft included 292 mm., also much longer than the body (c. f. Gray's measures above given), which measures the head included 235 mm. The hairs of the tail are long 92 mm., so that, if the hairs are spread out, the tail has a diameter of about 185 mm. — The most striking characters however the skull and teeth present. Dr. Günther very kindly allowed the skull of one of the largest specimens to be extracted for examination. In examining that skull Mr. Oldfield Thomas and I soon came to the conclusion that the specimen was

not yet fullgrown, the hindmost molars presenting themselves just above the level of the gums. There are 4 molars in each jaw. It here must be remembered that *Sciurus prevostii* and its allied species, all the other Asiatic striped squirrels and with a few exceptions nearly all the Asiatic squirrels always possess $\frac{5}{1}$ molars. The upper and lower incisors are provided with deep longitudinal grooves — 5 to 7 on each tooth in the upper jaw, 4 to 6 on each tooth in the lower jaw! — The skull compared with that part of other large squirrels, for instance *Sciurus bicolor* from Sumatra, shows that it is of a more elongated form:

	Sc. bicolor. mm.	Rh. macrotis. mm.
Length of skull	63	70
Greatest width of skull	43	39
Length of upper molar series	13	11.5
» » lower » »	14	12
Distance between the first upper molar and incisor	15	20
Distance between the eyeholes	29	22

For more details and measures of the curious shaped skull I refer to the figures and description which Mr. Oldfield Thomas intends to publish in the Proc. of the Zool. Soc. of London.

The preceding will clearly show, that I erroneously described the Saleyer squirrel as belonging to the same group as Gray's *macrotis*, that my error was a consequence of the insufficient description by the latter author and finally that Gray's genus *Rheithrosciurus* is a very good one.

NOTE XXXV.

THE COMATULAE OF THE LEYDEN MUSEUM.

BY

P. HERBERT CARPENTER, M. A.

The *Comatula*-collection of the Leyden Museum is one of considerable importance, owing to its containing a large proportion of the types of the species described by Johannes Müller in his classical memoir ¹⁾, »Ueber die Gattung *Comatula* Lam. und ihre Arten.»

Müller's descriptions, however, are notoriously incomplete, and have undergone no revision since their publication nearly forty years ago, during which time a very large number of *Comatulæ* have been discovered. Some of these have been referred with more or less success to one or other of Müller's species, but without careful comparison with his types no accurate specific determinations have been at all possible. When I visited the Leyden Museum last autumn for the purpose of examining the seven types of Müllerian species which it contains, I was not surprised to find a number of other *Comatulæ* in the collection. Thanks to the good offices of my friend Dr. Hubrecht, to whom I am indebted for many acts of kindness, the whole of the foreign *Comatula*-collection numbering twenty-five specimens was sent over to my laboratory at Eton, in order that I might study it in more detail than was pos-

1) Abhandl. d. Berlin. Akad. 1849. pp. 237—265.

sible during a short visit to the Museum. For this act of liberality on the part of the Director, Dr. Schlegel, I would here express my heartiest thanks.

Besides *Antedon rosacea* and *Ant. Eschrichtii* of the European seas, the collection includes ten species of *Antedon* from the Eastern seas. Two of these, *Ant. elongata*, and *Ant. flagellata* are the original types of Müllerian species; while a third belongs to *Ant. carinata* Lam. sp., the types of which are at Paris and Berlin. The remaining seven species are new, though they present but little variety of type. Four of them have only ten arms, and the other six all belong to one simple type in which the rays divide three or four times, each division consisting of two joints, the axillary without a syzygy.

The genus *Actinometra* is represented by a type specimen of *Act. solaris* Müll. which seems to have been subsequently described and figured as *Comatula hamata* by Kuhl and van Hasselt¹). There are also nine other species including the types of *C. timorensis*, *C. japonica*, *C. Novae Guineae* and *C. Bennetti* all of which, except the last, are now referred to the genus *Actinometra* for the first time. Simple ten-armed forms with the two outer radials not united by syzygy as they are in *Act. solaris*, are conspicuous by their absence, as is usual among the *Actinometrae* of the Eastern Seas; but in every type the rays divide more than once and the first division consists of three joints, the axillary with a syzygy. In two of the nine species there is no further division of the rays, while the remaining seven fall into two groups. In the one group which includes but two species, the second and subsequent ray-divisions consist of two joints only which are united by a syzygy, as are also the second and third radials; while in four of the five remaining species the second and

1) Herklots, J. A., Echinodermes peintes d'après nature par les soins de Kuhl, van Hasselt et Sal. Müller (1868), Amsterdam. Bijdrage tot de Dierkunde, IX, 1869, p. 10, Pl. IX.

subsequent ray divisions all resemble the first. The fifth species is peculiar; the third and fifth divisions resemble the first, but the second and fourth consist of only two joints without a syzygy.

The statements just made are tabulated in the accompanying Key to the species described in the following pages.

Family **Comatulidae**.

I. Mouth central or subcentral: anus excentric ¹⁾.

Ambulacra spotted with sacculi.

Oral pinnules not provided with a terminal comb.

Genus **Antedon**, de Frem.

A. Ten arms.

α . 60 overlapping cirrhus-joints . 1. *perspinosa*.

β . Less than 30 cirrhus-joints.

i. Arm-joints compressed and keeled. 2. *carinata* Lam.

ii. Arm-joints rounded.

1. Second radials closely united laterally.

Second brachials have a strong backward projection into first brachials.

3. *pinniformis*.

2. Second radials not united laterally.

Second brachials without backward projection . .

4. *serripinna*.

B. Rays may divide three or four times; each division of two joints, the axillary without a syzygy.

α . Later cirrhus joints spiny.

1. Rays in close contact; the lower joints of their outer arms flattened laterally . .

5. *flagellata*.

Lower pinnules stout.

Mus. Leyd.

1) The generic differences between *Antedon* and *Actinometra* are given in more detail in my First Report on the *Comatulæ* dredged by the U. S. Coast Survey. See the Bull. Mus. Comp. Zool. Vol. IX, n° 4. Cambridge, U. S. 1881.

- II. Rays well separated.
 - Lower pinnules slender 6. *elongata*. Mus. Leyd.
 - β. Later cirrhus-joints not spiny.
 - I. Pinnule on sixth brachial larger than that on fourth brachial 7. *bimaculata*.
 - II. Pinnule on fourth brachial larger than that on sixth brachial.
 - 1. Lower pinnules not specially stiff.
 - Smooth wedgeshaped arm joints with forward projections alternately on opposite sides.
 - a. Second radials much longer at sides than in the middle. Rays in close contact; outer joints of primary arms flattened laterally. 8. *brevicuneata*.
 - b. Second radials scarcely longer at sides than in the middle. Rays well separated 9. *laevirra*.
 - 2. Lower pinnules stiff and styliform.
 - Arm-joints bluntly wedgeshaped, without forward projections 10. *spicata*.
- II. Mouth more or less excentric; anus subcentral.
 - No sacculi at sides of ambulacra.
 - Oral pinnules provided with terminal combs Genus **Actinometra** Müll.
 - A. Second and third radials united by syzygy.

- α . Ten arms. 11. *solaris* Lam.
 β . Many arms. Rays may divide five times or more. First division of 3 joints, the axillary with a syzygy. Subsequent divisions of two joints united by syzygy.
 I. Centrodorsal bears functional cirrhi 12. *Novae Guineae*. Mus. Leyd.
 II. Centrodorsal stellate, without functional cirrhi . . . 13. *typica* Lovén.
 B. Second and third radials united by ligament.
 Many arms. First ray division of three joints, the axillary with a syzygy.
 α . Rays divide three times. Subsequent divisions like the first.
 I. Lower pinnules large and massive 14. *robustipinna*.
 II. Lower pinnules not specially stout.
 1. 50 cirrhi. First two radials concealed. Axillaries long with sharp distal angle 15. *japonica*. Mus. Leyd.
 2. Not more than 25 cirrhi. 3 radials visible. Axillaries have wide angle 16. *parvicirra*. Müll.
 β . Rays may divide five times or more.
 I. Third and fifth ray-divisions like the first. Second and fourth divisions of two joints, the axillary without a syzygy. 17. *alternans*.

- II. All ray-divisions like the first.
1. Rays in close contact: the joints flattened laterally as far as the third axillary 18. *Schlegelii*.
 2. Rays more or less separated. Lower joints not flattened.
 - a. 50 cirrhi of 25 unequal joints 19. *Bennetti*. Mus.
 - b. 25 cirrhi of about 30 tolerably equal joints. 20. *Peronii*. Leyd.

I. *Antedon* de Freminville. 1811.

1. *Antedon perspinosa*, n. sp.

Description of an individual.

Centrodorsal discoidal, bearing upon its margin about 20 long and slender cirrhi. These are composed of about 60 joints, the lowest of which are slightly longer than broad. Each joint in the lower and middle parts of the cirrhus expands towards its distal end so as to overlap the base of the next joint, and its edges are fringed with small spines. This overlap gradually disappears on the ventral side of the later joints, and becomes gradually replaced on the dorsal side by two small spines near the middle of each joint. In the terminal joints these spines become smaller and closer together, and the penultimate one bears a single larger spine in opposition to the terminal claw.

The first radials are partially visible; the second twice their length, nearly oblong, and quite free laterally: the axillaries pentagonal with a wide distal angle and nearly twice the length of the second radials. The middle line of their apposed edges is marked by a slight spiny tuber-

ele, and there is a similar but less marked one on the junction of the first and second brachials. Arms ten, of 150 + joints. First brachials rhomboidal, almost completely united laterally; the second longer and more wedgeshaped. These two joints and the axillaries have irregular blunt processes on their outer edges. The next four or five joints are transversely oblong. The following ones longer, sharply wedgeshaped, and overlapping. Towards the ends of the arms they become blunter and squarer. The raised distal edges of all the joints are fringed with short spines.

The first syzygium is on the third brachial, and the next is usually on the seventh or eighth brachial. After this the syzygial interval may be from three to eighteen joints, being usually three or four joints in the lower parts of the arms, and six or seven joints in their outer portions. The lower pinnules are stiff and styliform, consisting of about fifteen long, cylindrical, and overlapping joints with expanded and spiny distal edges. That on the fourth brachial is slightly longer than that on the second; and the following ones gradually diminish in stoutness and stiffness, but increase in length and in the number of joints. Those on the outer parts of the arms reach nearly twenty millim. in length and consist of about thirty elongated joints with expanded distal ends bearing numerous spines, the outermost of which are much longer than the rest.

Disc naked and much incised; 7 mm. in diameter.

Spread, about 30 centim.

Colour, dark reddish brown: sacculi moderately close along the pinnule ambulacra.

Locality. The Island of Jobie. *Coll.* von Rosenberg.

2. *Antedon carinata*, Lam. sp.

1811. *Antedon gorgonia?* de Freminville. *Nouv. Bull. d. Scienc. par la Soc. Philomat.*, II, p. 349.

1815. *Alecto carinata?* Leach. Zool. Miscell., II, p. 63.
 1816. *Comatula carinata*, Lamarek. Syst. d'Anim. sans Vert. II, p. 536.
 1834. *Comatula carinata*, de Blainville. Manuel d'Actinologie, p. 249.
 1843. *Alecto carinata*, Müller. Wiegmann. Archiv. 1843, I, p. 135.
 1849. *Comatula (Alecto) carinata*, Müller. Abhandl. d. Berlin. Akad., p. 252.
 1862. *Comatula carinata*. Dujardin. Hist. Nat. des Zoophytes. Echinodermes, p. 200.
 1865? *Alecto Braziliensis*, Lütken. M.S.
 1868. *Antedon Dübenii*, Verrill (non Bölsche). Trans. Conn. Acad. I, p. 365 (with?).
 1878. *Antedon carinatus*, Pourtales. Bull. Mus. Comp. Zoöl. V, p. 214 (with?).
 1879. *Antedon Brasiliensis*, P. H. Carpenter. Proc. Roy. Soc. N^o. 194, p. 386.
 1879. *Antedon carinata*, P. H. Carpenter. Trans. Linn. Soc., Sec. Ser. Zool., II, p. 29.
 1879. *Antedon carinatus?* Rathbun. Trans. Conn. Acad. V, p. 156.
 1881. *Antedon carinata*, P. H. Carpenter. Bull. Mus. Comp. Zool. Vol. IX. N^o. 4.

The Museum contains a small and mutilated specimen of this widely distributed species from the Indian Ocean. It differs from specimens obtained at Mauritius (the original locality of the species) in the somewhat larger relative size of the lower pinnules, and in the greater smoothness of the outer portions of the arms.

3. *Antedon pinniformis*. n. sp.

Description of an individual.

Centrodorsal a convex disc bearing about 12 marginal cirrhi. These have about 25 thick joints none of which

are longer than broad. Each one from the eighth onwards bears a slight dorsal spine which becomes somewhat larger on the penultimate joint. The first radials are partially visible; the second oblong and almost completely united laterally. Axillaries widely pentagonal, nearly twice the length of the second radials, with strong backward projections into them, the surfaces of both joints rising somewhat towards their junction. Ten arms. First brachials bluntly wedgeshaped, and closely united laterally. Each has its distal border incised to receive a strong backward projection of the irregularly shaped second brachial. Third brachial oblong, a syzygy. The next five joints are wide and nearly oblong, with slight backward projections from their proximal edges alternately on opposite sides of the arm; the following joints longer and wedgeshaped, becoming more oblong again in the outer parts of the arms.

Syzygia very irregular after the first one on the third brachial; the next may be anywhere between 14 and 21; then an interval of 5—18 joints between successive syzygia.

The stoutest pinnules are those borne by the fourth and fifth brachials, which consist of about 12 thick joints slightly longer than broad. Those on the second and third brachials are less stout at the base but about as long as those on the sixth and seventh joints, the immediate successors of which are the shortest pinnules on the arm. The following pinnules gradually increase in length, their component joints becoming longer but more slender. The outer pinnules are longer than the lower ones, and being very closely set give the arms a very feathery appearance.

Disc naked; 5 mm. in diameter. Spread about 12 centim.

Colour, white: the arms rather scantily clothed with a browner perisome, so that the ambulacra are close down on the muscles.

Sacculi closely set along the pinnule ambulacra.

Locality. Andai, New Guinea.

4. *Antedon serripinna*, n. sp.*Description of an individual.*

Centrodorsal discoidal, bearing about 12 marginal cirrhi. These have about 18 thick joints none of which are longer than broad, the penultimate one bearing a blunt spine.

The first radials are scarcely visible even at the angles of the calyx; the second nearly oblong and not united laterally; the axillaries less than twice their length, almost triangular, with wide distal angles and slight backward projections from the middle of their bases.

Ten arms. First brachials almost rhomboidal, and closely united laterally; the second distinctly shorter and more wedgeshaped. Third brachial a syzygy, transversely oblong or nearly square. The next few joints short and oblong, and the following ones longer and sharply wedgeshaped, gradually becoming blunter towards the arm-ends.

The first syzygium is on the third brachial, and the next usually between 11 and 15; after which the syzygial interval is usually 3 or 4 joints.

The stoutest pinnules are those borne by the fourth and fifth brachials. They consist of about 15 joints, all but the uppermost of which are short, broad, and thick with their distal edges projecting beyond the base of the next joint, so as to give the pinnule a serrated outline. The pinnules on the second and fourth joints are slightly longer than those on the third and fifth joints respectively. Those immediately following are shorter and composed of a few elongated joints, after which the length gradually increases, though never much exceeding that of the large lower pinnules.

Disc, naked and somewhat incised; barely 5 mm. in diameter. Spread about 6 centim.

Colour, white with deep purple bands on the arms, especially at the syzygies. Sacculi closely set along the pinnule ambulacra, and rather farther apart on the arms.

Locality. Andai, New Guinea.

5. *Antedon flagellata*, Mus. Leyd. sp.

1841. *Alecto flagellata*, Müller. Monatsbericht d. Berlin. Akad. p. 186. — Id., Wiegman's Archiv. 1841, I, p. 145.
 1849. *Comatula flagellata*, Müller. Abhandl. d. Berlin. Akad. 1849, p. 263.
 1862. *Comatula flagellata*, Dujardin. Hist. nat. des Zoophytes. Echinodermès, p. 206.

Description of an individual.

Centrodorsal moderately thick, with a smooth dorsal surface and three irregular rows of cirrhi on its sides. About 40 cirrhi, of 25-35 tolerably equal joints, hardly any of which (in mature cirrhi) are longer than wide. The lowest joints are short, the length increasing gradually up to the tenth joint which is about square. The next two or three joints are of the same shape or a trifle longer, after which the length gradually decreases and a blunt dorsal spine appears near the distal ends of the joints. It increases slightly in size for two or three joints, then diminishes and comes to be nearer their proximal ends, reappearing on the penultimate joint as a moderately strong opposing spine.

The first radials are scarcely visible even at the angles of the calyx; the second and third very convex, the former in close contact laterally; the latter less than twice their length, almost triangular, with very open angles.

38 arms, each of about 200 joints. The rays may divide four times, each division of two joints, the axillary not a syzygy, short and wide with an open angle. The first joints after each division closely united laterally, and slightly raised in the middle of their junction with their successors.

The first three or four brachials on the two outer arms of each ray have their outer sides flattened where they are opposed to their fellows of the next ray. First brachials rhomboidal; the second shorter and more wedgeshaped. The third a syzygy and more nearly oblong; the next

five or six short and oblong, after which the joints become sharply wedged-shaped and somewhat longer, though still relatively short. After about the 50th joint they become blunter and more oblong, and finally somewhat squarer towards the arm-ends.

The first syzygium is on the third brachial, and the next usually between 15 and 21; then an interval of 9—16 joints between successive syzygia.

The largest pinnules are those borne on the fourth and five following brachials. Those on the sixth and seventh brachials are the longest on the arm and consist of 25—30 stout cylindrical joints. The first pair, on the second and third brachials, are considerably shorter and smaller than their three successors on each side; the pinnule on the tenth brachial is small on the inner arms of the ray, but more equal to its predecessor on the outer arms. The next few joints bear the smallest pinnules on the arm, after which the length gradually increases towards the arm-ends, but the pinnules never become specially long.

Disc, naked and much incised; 25 mm. in diameter.

Total spread about 25 centim.

Colour brownish white with greyer perisome. Sacculi not very abundant along the pinnule ambulacra.

Locality. Uncertain.

Coll. Brugmans.

Remarks. The general *facies* of this fine species leaves little room for doubting its Oriental origin; but I have never come across a second specimen of it. The specific name as in the case of Müller's other types in the Leyden Museum (except *Actinometra solaris*), seems to have been a Museum name which was adopted by him.

Two *Myzostoma*-cysts occur on the arms of this specimen, which seem to have escaped Müller's attention.

6. *Antedon elongata*, Mus. Leyd. sp.

1841. *Alerto elongata*, Müller. Monatsbericht d. Berlin. Akad. p. 187. — Id., Wiegman's Archiv. 1841, I, p. 146.

Notes from the Leyden Museum, Vol. III.

1849. *Comatula elongata*, Müller. Abhandl. d. Berlin. Akad. 1849, p. 257.
 1862. *Comatula elongata*, Dujardin. Hist. nat. des Zoo-phytes. Echinodermes, p. 204.

Description of an individual.

Centrodorsal a moderately thick convex disc bearing about 30 cirrhi in two irregular rows round its margin. The cirrhi have 25—30 tolerably even sized joints, the sixth and four following ones of which are slightly longer than broad. The succeeding ones bear slight dorsal spines, that on the penultimate joint enlarging somewhat as an opposing spine to the terminal claw.

The first radials are just visible; the second, united laterally, short, wide, and very convex; the axillaries short, less than twice the length of the second radials, and pentagonal with wide distal angles. The rays are well separated and bear more than twenty (20 +) arms of over two hundred joints. They may divide three times, each division of two joints, the axillary not a syzygy. The first joints after each axillary are rhomboidal, closely united laterally, and form with their successors a slight tubercular elevation in the middle of their line of junction.

Second brachials bluntly wedgeshaped and slightly longer than preceding joints; the third (syzygies) and fourth, short and oblong. The next few joints have slightly oblique terminal faces, and the following ones are smooth, short, and sharply wedgeshaped, becoming shorter and blunter about the fortieth joint and squarer towards the ends of the long arms.

First syzygium on the third brachial; the next usually between 8 and 17; then an interval of 4—11, usually 6—8 joints between successive syzygia.

The first two pinnules are moderately short and slender, the size increasing up to those borne on the sixth, seventh, and eighth brachials. These have wide basal joints, the later ones being longer and tapering rather rapidly.

Pinnules on ninth and tenth brachials a good deal smaller than that on the eighth, but larger than the first pair.

The following ones gradually increase in length and slenderness, their component joints becoming more and more cylindrical, but they never exceed the length of the third pair. Terminal pinnules again shorter, very thin and delicate.

Disc lost. Spread about 25 centim. Diameter across the circle of palmar axillaries about 14 mm.

Colour, brownish white with darker perisome. Sacculi numerous at sides of pinnule ambulacra.

Locality. New Guinea.

Coll. S. Müller.

Remarks. This is another of Müller's types for which he employed a Museum-name. I have not seen any duplicate of it.

7. *Antedon bimaculata*, n. sp.

Description of an individual.

Centrodorsal a thick spreading disc, with a slightly hollowed dorsal surface, and bearing about 40 marginal cirrhi. These have about 25 joints, of which the fifth and three following ones are slightly the longest. The following joints diminish slowly in size and the penultimate has a blunt opposing spine to the terminal claw.

The first radials are just visible at the angles of the calyx; the second short, and in close contact laterally; the axillaries more than twice their length, widely pentagonal with open distal angles.

More than thirty-six (36+) arms of 150 joints. The rays may divide three times, each division of two joints which are slightly raised in the middle of their junction, the axillary not a syzygy. The first joints after each axillary are rhomboidal and closely united laterally. Second brachials shorter than the first and more wedgedshaped; the third (syzygies) and five or six following joints more oblong. The next joints are short and sharply wedgedshaped, becoming

blunter again about the 40th joint, more oblong, and squarer or slightly elongated towards the arm-ends.

First syzygium on the third brachial; the next between 18 and 23; then an interval of 6—18, usually 7—11 joints between successive syzygia. Lower pinnules stiff. The first pair small; the next pair nearly twice their length, and the following ones, on the sixth and seventh brachials respectively, are the longest on the arm, consisting of about 30 stout cylindrical joints.

Pinnule on the eighth brachial nearly as long as that on the sixth, but the next pair are much smaller, after which the size increases very gradually till near the arm-ends; but the outer pinnules though slender never become specially long.

The pinnules on the fifth and seventh brachials are nearly equal on some of the smaller arms and the relative sizes of all the lower pinnules are apt to vary a good deal upon arms which have been restored from the first or second brachials.

Disc, naked and much incised; 17 mm. in diameter.

Spread, about 20 centim.

Colour. Skeleton grey up to the last axillary. Arm-bases grey or white, and marked with a double row of purplish spots. The first of these is near the outer end of the line between the second and third brachials; the next towards the inner end of the line separating the third and fourth joints, and so on alternately on opposite sides for four or five joints. Beyond this limit the arms are dark purple, or almost black, with occasional white patches. Sacculi numerous along the pinnule ambulacra.

Locality. Amboyna.

The peculiar colouring and the large size of the third pair of pinnules readily distinguish this species among the few *Antedons* hitherto recorded from the Moluccas.

8. *Antedon brevicuneata*, n. sp.

Description of an individual.

Centrodorsal a thick disc with a slightly hollowed

dorsal surface, and a single or partially double row of marginal cirrhi. There are about 30 of these consisting of 25—30 tolerably equal joints, the 6th and 7th about square and the next two or three just longer than broad. The following joints diminish gradually in size towards the end, but without developing dorsal spines except for a small and blunt one on the penultimate.

First radials not visible; second and third very convex, the former being shorter in the middle than at the sides where they are closely united to their fellows; axillaries short, pentagonal, with wide distal angles, less than twice the length of the second.

39 arms. Rays in close contact but dividing three times, each division of two joints, the axillary not a syzygy. The joints of the primary arms on the outer sides of the rays are somewhat flattened laterally where they are in contact with their fellows. First brachials large and rhomboidal; the second shorter, and much more wedgeshaped: the third (syzygy) nearly square, rather longer on inner than on outer side. The next five joints nearly oblong with slight forward projections alternately from the outer and inner sides of their distal edges. The following joints are smooth, short and wedgeshaped, retaining the forward projection about as far as the 60th, but much more markedly in some arms than in others. Later joints gradually become blunter and nearly square at the extreme arm-ends. First syzygium on 3rd brachial; the next on 4, 5, 9, or as far as 17: then an interval of 7—18 joints, usually about 10, between successive syzygia.

The largest and stoutest pinnule on the outer side of the arm is the second, borne by the 4th brachial. It is about 10 mm. long and consists of about 25 joints which are stout at the base but taper away rapidly towards the end. 5th brachial bears a similar but somewhat smaller pinnule. Relative sizes of pinnules on 2nd and 6th br. rather variable, but both are smaller than that on 4th

br. Fourth pinnule (on 8th br.) of only 7 or 8 small joints, a good deal shorter than the third, and only about one quarter as long as the second pinnule. Following pinnules gradually increase in length and size, and the joints of the later ones become more elongated; but they never reach the length of the large basal pinnules, nor are they very closely set.

Disc, naked and deeply incised, almost to the centre; diameter 10 mm.

Spread, 18 centim.

Colour, calyx and arm-bases white with darker patches; lower arms a dirty brownish grey, and their outer portions the same mottled with white. Sacculi not very close on pinnule ambulacra.

Locality, Amboyna.

9. *Antedon laevicirra*, n. sp.

Description of an individual.

Centrodorsal discoidal with a flat cirrus-free dorsal surface, and bearing about 30 cirrhi in a single or partially double marginal row. Cirrhi of 25—30 tolerably uniform smooth joints, few or none of which are longer than broad; penultimate has a faint opposing spine to the small terminal claw.

First radials not visible; the second short and nearly united laterally; axillaries more than twice their length, pentagonal with wide distal angles.

Nearly 40 arms of about 160 smooth joints. Rays divide three times; each division of two joints, the first closely united to their fellows, and the axillary not a syzygy. First brachials almost rhomboidal, relatively long and narrow, closely united to their fellows. Second joints much shorter and nearly oblong; third (syzygy) nearly square. The next six joints short and nearly oblong; the following ones longer and sharply wedged with traces of a forward projection alternately on opposite sides, as in the last species. Outer joints becoming blunter, squarer and slightly elongated towards arm-ends.

First syzygium on 3rd brachial; the next between 18 and 21; then an interval of 9—13 joints, usually 11, between successive syzygia.

The longest and stoutest pinnules on the arm-bases are those borne by the 4th and 5th brachials, the former consisting of about 25 tapering joints being considerably the larger. Third pair (on 6 and 7 br.) smaller than the first pair, and the fourth pair still more so, being the smallest pinnules on the arm. The length of the following pinnules gradually increases but never reaches that of the second pair, and their component joints are not specially delicate, while they are well clothed with perisome up to the arm-ends where the size again decreases.

Disc naked, and somewhat incised; 12 mm. in diameter. Spread, 25 centim.

Colour, blackish with lighter bands.

Locality. Aru-Islands. *Coll.* von Rosenberg.

10. *Antedon spicata*, n. sp.

Description of an individual.

Centrodorsal thice, discoidal, with a small, slightly hollowed dorsal surface, and very sloping sides which bear about 25 cirrhi in an irregular double row. These have about 25 joints, the fourth of which is longer than wide: the next three are the longest and the following ones diminish gradually in length, the penultimate having a tolerably strong opposing spine.

First radials barely visible; the second oblong and not united laterally; axillaries pentagonal with wide distal angles and relatively short, only half as long again as the preceding joints. The outer edges of the axillaries and of the next three or four joints bear small irregular tubercles. 28 arms of nearly 200 joints. Rays divide three times; each division of two joints, the first almost completely united to their fellows, and the axillary not a syzygy. First brachials widely rhomboidal; the second of about the same length but more wedgedshaped; the third

(syzygy) nearly square. The next four are oblong, and the following ones wedgeshaped, of medium length, and very slightly overlapping; the later ones are blunter and more oblong, becoming squarer and slightly elongated at the arm-ends.

The muscle-plates of successive joints stand up rather prominently, alternately on either side of the ambulacral groove.

First syzygium on 3rd brachial; the next between 15 and 18; then an interval of 3—10 joints, usually 5—7, between successive syzygia.

The second brachial bears a moderately long but slender pinnule, and the next joint a shorter one; the next pair on 4th and 5th joints are longer than the first pinnule, stiff, tapering, and styliform, consisting of about 15 elongated joints. That on the 4th joint is the longer, reaching 15 mm.

The next pinnule is stiff but shorter again, and the following ones decrease till about the tenth brachial, after which the size increases slowly. Towards the arm-ends the pinnules become slender and filiform, but they never reach the length of the second pair.

Disc naked and much incised; 17 mm. in diameter.

Spread, 20 centim.

Colour, the skeleton light purplish red with darker bands at the junctions; the perisome very much darker, almost black. Sacculi closely set along the pinnule ambulacra.

Locality. The Banda Sea. Coll Dr. Semmelink.

Remarks. This type differs from *Ant. articulata*, the Moluccan species described by Müller, in having fewer cirrus joints and no spines on the later ones. The syzygial interval on the arms is much shorter, and the fourth pinnule is relatively smaller.

Antedon seems to be comparatively rare in the Moluccas. I know of more than a dozen *Actinometra*-species from these islands, but of only six *Antedons* which with one ten-armed exception (*Ant. Jacquinoti* Müll. sp.) all agree in the characters of the ray-divisions. Three of

them have been described above; two are at Paris, and the remaining one in the University Museum at Berlin, having been brought from Batjan by Prof. E. von Martens.

Ant. spicata is closely allied to the Fijian *Ant. protecta* Lütken M.S. which has nearly 50 cirrhi, smoother arm-joints, and a relatively smaller pinnule on the fifth brachial; but the stiff and pointed lower pinnules are striking features of both species.

II. Actinometra. Müller, 1841; emend. P. H. Carpenter. 1877 ¹⁾).

11. *Actinometra solaris*, Lam. sp.

1816. *Comatula solaris*, Lamarek. Syst. d'Anim. sans Vert. II. p. 534.

1834. *Comatula solaris*, de Blainville. Manuel d'Actinologie. p. 249.

1841. *Actinometra imperialis*, Müller. Monatsber. d. Berlin. Akad. 1841. p. 181.

Wiegman's Archiv. 1841. I. p. 141.

1843. *Alecto solaris*, Müller. Wiegman's Archiv. I. p. 135.

1849. *Comatula (Actinometra) solaris*, Müller. Abhandl. d. Berlin. Akad. 1849. p. 248.

1862. *Comatula solaris*, Dujardin. Hist. nat. des Zoophytes. Echinodermes. p. 200.

1862. *Actinometra imperialis*, *ibid.* p. 209.

1869 *Comatula (Actinometra?) hamata*, Kuhl and v. Hasselt. Herklots J. A. Echinodermes peintes d'après nature par les soins de Kuhl, van Hasselt, et Sal. Müller. Amsterdam. Bijdragen tot de Dierkunde. IX p. 10. Pl. IX.

1879. *Actinometra solaris*, P. H. Carpenter. Trans. Linn. Soc., Sec. Ser. Zool. Vol. II. p. 27.

The single specimen of this species in the Museum ap-

1) Journ. Linn. Soc. Zool. Vol. XIII. p. 441.

See also, Trans. Linn. Soc., Sec. Ser. Zool. Vol. II p.p. 18—20.

pears to be the one brought from Cape Bantano by Salomon Müller, and figured in the »Echinodermes peintes d'après nature'' as *Comatula (Actinometra?) hamata*. Kuhl and van Hasselt. The type is a very variable one, however, and this specimen does not appear to be sufficiently distinct from Lamarck's original specimen in the Paris Museum to justify the establishment of an other species.

12. *Actinometra Novae Guineae*, Mus. Leyd. sp.

1841. *Alecto Novae Guineae*, Müller. Monatsber. d. Berlin. Akad. 1841. p. 186. Wieg. Archiv. 1841. I. p. 146.

1849. *Comatula Novae Guineae*, Müller. Abhandl. d. Berlin. Akad. 1849. p. 264.

1862. *Comatula Novae Guineae*, Dujardin. Hist. Nat. des Zoophytes. Echinodermes. p. 208.

Description of an individual.

Centrodorsal a thin pentagonal disc, with its angles slightly produced and about 15 cirrus-sockets on its sloping sides. Cirrhi all lost. Traces of clefts appear between the sides of the centrodorsal and the inner margins of the short first radials. Second radials shorter than the first, widely hexagonal, and only partly united laterally.

Axillaries free, pentagonal, barely two and a half times the length of the second, to which they are united by syzygy. Rays quite free laterally, dividing four or five times. Primary arms of three distichal joints, the axillary a syzygial or double joint. In subsequent divisions every second joint is an axillary united by syzygy to its predecessor, which is only partly united laterally with its fellow. 56 arms First brachial a syzygy, oblong or nearly square; the second usually simple, but sometimes a syzygy. The next two or three joints are transversely oblong, and their immediate successors longer, wedged-shaped, and slightly overlapping. After this both length and breadth diminish and the joints gradually become blunter and smoother,

elongating again towards the arm-ends. The arms are dimorphic, those on one side of the calyx (probably posterior) being shorter, with only 60—70 joints, and tapering more rapidly than the longer anterior arms with 80—90 joints.

First brachial a syzygy, and frequently also the second, especially on those single undivided arms borne by axillaries which bear dividing arms on their other faces. The next syzygy usually on the 8th or 9th joint, after which an interval of two joints, or sometimes only of ones between successive syzygia.

The second distichal bears a moderately long pinnule with a well marked terminal comb. The next pinnule (normally) is on the epizygal of the first brachial. Its size and that of the pinnule on the second brachial vary considerably, being greater on the outer than on the inner arms of each ray; but there is a gradual decrease from the first pinnule to those on the fourth and fifth brachials after which they increase again, losing the terminal comb about the 8th brachial. Their cuboidal joints have spiny tufts in the mediadorsal line, and at the distal end of each joint are one or two rather larger lateral spines. Towards the arm-ends the pinnules gradually become more slender, but increase very little in length, their joints becoming oblong and the large lateral spines almost entirely limited to their outer sides.

Disc lost; some of the shorter arms have only an imperfect groove and tentacular apparatus, or none at all.

Colour, skeleton greyish white; the perisome a darker grey.

Spread, about 180 centim. Diameter of calyx measured across the radials, 10,5 mm.

Locality, The Island of Eidouma, New Guinea.

Coll. Sal. Müller.

Remarks. The above description differs considerably from that which was drawn up by Müller on the basis of Troschel's examination of this specimen. He is not very clear

as to whether there are three or four joints in the primary arms; but he says distinctly that no axillary has a syzygy. As a matter of fact there are three distichal joints of the usual character, the third or axillary being a syzygial or double joint; and though the successive axillaries are separated only by single joints, yet these very joints are united by syzygies to the axillaries above them. Further, the second and third radials are united by syzygy, and the first brachial is also a syzygial or double joint, as to both of which characters Müller is silent.

Misled by Müller's description I have mentioned *Com. Novae-Guineae* as among the *Comatulæ* dredged by the »Challenger" ¹⁾. This, however, is not the case, though the type in question (from Banda) corresponds very closely with Müller's specific diagnosis of the New Guinea specimen. Even as it is I cannot be positively sure that there are syzygies in this last between the two outer radials, and between each axillary and the joint below it, as it presents no natural fractures; and future dissection of another specimen may show that this is not the case. Under these circumstances the specific diagnosis of the type would require a second revision; but I venture to think that this will not be necessary.

The nearest ally of *Actinometra Novae Guineae* is the singular type described by Lovén under the name of *Phanogenia* to which we will now pass on.

13. *Actinometra typica*, Lovén. sp.

1866. *Phanogenia typica*, Lovén. Öfvers. af. K. Vet. Akad. Förh. Arg. 23. N^o. 9. p. 231.

Actinometra stellata, Lütken. M.S. Museum Godeffroy.

Locality, Jobie.

Coll. von Rosenberg.

1) Proc. Roy. Soc. 1879. N^o. 194, p. 386.

The genus *Phanogenia* was established by Lovén in 1866 for the reception of some remarkable *Comatulæ* from Singapore¹). They are especially characterised by having a more or less stellate centrodorsal which bears few or no traces of cirrus-sockets, and occupies but does not completely fill the central space within the radial pentagon. The same peculiarity was noted by Dr. Lütken in an *Actinometra* of the Godeffroy collection from Fiji, to which he gave the M.S. name *Actinometra stellata*; and duplicates of the type have been distributed from the Godeffroy Museum under this name. Having examined some of these duplicates and also, by the kindness of Prof. Lovén, his original specimens of *Phanogenia* I am disposed to regard the two types as identical. During my visit to Copenhagen last autumn I was glad to learn that the same idea had also occurred to Dr. Lütken, with whom I am pleased to find myself in accordance as to the generic position of the type.

In my preliminary report²) upon the *Comatulæ* of the »Challenger» Expedition I pointed out that the peculiar stellate condition of the centrodorsal of *Phanogenia* »appears to be one of the concluding stages of a long series of changes in the shape and relations of the centrodorsal, which do not commence until some time after the loss of the stem, and the entry upon the free state of existence.” I also gave some account of these stages as exhibited by *Actinometra jukesii* and by other species of the genus³). But not having seen *Phanogenia* at that time I felt unable to refer it to *Actinometra* in the face of Lovén's description, »*Os centrale sulci tentaculiferi fere quales in Antedone.*” Since my examination of it, however, I do not

1) *Phanogenia*, ett hittills okänt slagte af fria Crinoideer. Öfvers. af K. Vet. Akad. Förh. Arg. 23. N^o. 9. pp. 223—233.

2) Proc. R. S. 1879. N^o. 194. pp. 390—392.

3) It is worth notice that a fossil *Actinometra* with a stellate centrodorsal devoid of cirrus-sockets has been found in the Gault (*Albien*) of Folkestone. Quart. Journ. Geol. Soc. Vol. XXXVI. p. 51.

think that it can be regarded as generically distinct from *Actinometra*; though there are certain features about it, besides the stellate centrodorsal, which distinguish it in a very marked manner from the other species of the genus.

In ordinary *Actinometra*-species ¹⁾ the mouth is some little way from the centre of the disc which is occupied by the anal tube. But in Lovén's specimens from Singapore, as in Lütken's from Fiji and in others which I shall mention immediately, the mouth, though not absolutely central, is only slightly excentric, and the anus is at or near the margin of the disc. In fact it is sometimes very difficult to find the anus at all. In this respect the disc of *Actinometra typica* approaches that of *Antedon*; but the distribution of the ambulacra is not so symmetrical as in *Antedon*, and the anal interradius is always by far the largest. The presence of a terminal comb on the oral pinnules, the general features of the calyx, and the absence of sacculi from the pinnule ambulacra also distinguish this type very sharply from *Antedon*.

Another character in which *Act. typica* differs from ordinary *Actinometra*-species and also from *Antedon*, is in the peculiar mode of union of the second and third radials which I believe to be an imperfect form of syzygy, although Lovén ²⁾ describes it as a ligamentous articulation.

When two joints are united by syzygy, as the two outer radials are in *Act. jukesii*, *Act. solaris*, *Act. robusta* and others, each of their apposed faces is marked by a number of low ridges, which diverge from the opening of the central canal and extend towards the dorsal margin of each joint, causing it to be delicately toothed ³⁾. In the natural positions of the apposed faces their ridges correspond in position, so that the presence of the syzygy is indicat-

1) Trans. Linn. Soc. Ser. 2. Zool. Vol. 11. Pl. 1. Pl. 2. figs 1, 8.

2) Loc. cit. p. 228.

3) This is well shown in fig. 7 D on Pl. XXXVI of Dr. Carpenter's memoir on *Antedon rosacca*. Phil. Trans. 1866.

ed by a delicate dotted line which crosses the dorsal surface of the compound joint, the dots indicating the gaps between adjacent pairs of corresponding ridges ¹⁾).

In a true ligamentous articulation, on the other hand, such as occurs between the outer radials of every *Antedon* ²⁾ and of most *Actinometrae* ³⁾ each of the articular faces is divided by a vertical ridge into two fossae which give attachment to the large interarticular ligaments. Each of these fossae is marked more or less distinctly by a series of concentric lines like the lines of growth in a bivalve shell; and the vertical articular ridge that separates them usually stands up rather prominently, especially around the opening of the central canal.

In *Actinometra typica*, however, these features are not visible on the apposed faces of the two outer radials ⁴⁾, which are almost flat and cannot be said to have any distinct articular ridge; and although there is a median vertical line on each face which divides it into two lateral halves, yet these are not fossae and show no traces of any concentric markings. Each of them is marked by a number of little elevations, squarish or oblong in shape, and so arranged as to have their longer axes radiating outwards from the central canal. This is much more marked in some cases than in others, and the result is that the joint-face looks as if the radiating ridges of a syzygy were interrupted at intervals. They do not, however, reach the dorsal margin, or only very rarely, so that the dotted line indicating a syzygy is hardly traceable.

In an ordinary *Antedon*-syzygy there is no division of the joint-face into two lateral portions as in the case just described which is thus somewhat intermediate in its nature, presenting a distinct approach to a ligamentous ar-

1) Phil. Trans. loc. cit. Pl. XXXVI. figs. 5 D, 6 D.

2) *Ibid.* figs. 2 B, 3 A, 4 B, 5 A.

3) Linn. Trans. loc. cit. Pl. 7. figs. 2 b, 3 a, 5 b, 6 a.

4) K. Vet. Akad. Förh. loc. cit. p. 230. fig. c. (Compare also figs. d, k, l.)

ticulation while still retaining its syzygial character. Lovén has given a diagram of it as an articular face in *Phanogenia* (*Act. typica*), and I have studied it in a much mutilated specimen dredged by the »Challenger» in the neighbourhood of the Fiji Islands. The only reason for calling it an articulation is the presence of the median vertical line, which can hardly be called a ridge, dividing the face into two parts. But Lovén figures a similar ridge on the »facies syzygii brachialis 1—2 rami tertii» which is an undoubted syzygy¹⁾ with radiating striae reaching the dorsal margin. I find traces of a similar median line on the syzygial faces of the lower arm-divisions of the »Challenger» specimen, but it gradually disappears and the syzygial faces of the outer arm-joints are of the ordinary character.

It may be noted here that radiating striae are not necessarily characteristic of a syzygy, being absent in *Pentacrinus* and in *Rhizocrinus*, in which the apposed faces are smooth and devoid of any markings whatever.

The following are the characters which I believe to be more especially distinctive of *Actinometra typica*. Lovén has already given an admirable detailed description of the type²⁾.

»Centrodorsal stellate, with few or no cirrhus-sockets, and nearly flush with the radials. Second and third radials united by syzygy, but the junction line is rarely dotted. Rays may divide 7 or 8 times. Primary arms of three distichal joints, the axillary a syzygy³⁾. Subsequent divisions each of two joints united by syzygy. A syzygy in the first brachials; the next usually between the 8th and 10th brachials, and then an interval of two joints between succes-

1) Loc. cit. p. 230. d.

2) Loc. cit. pp. 231—233.

3) According to the usual rule; one would expect the first and second distichals (both in this and in the preceding species) to be united by syzygy like the outer radials. Not having seen a joint face I cannot speak positively, but judging from Lovén's description (p. 233) I think that there may possibly be a ligamentous articulation in this position.

sive syzygia. Pinnules decrease in length to about the 6th brachial and then increase again, but rarely, if ever, reaching the length of the lowest pinnules. Joints of middle and later pinnules very spiny. Mouth usually subcentral and radial, but the ambulacra unequal. Anus marginal."

No two specimens of this type that I have seen are precisely similar, but they pass into one another so very gradually that it is practically impossible to separate them. Von Rosenberg's specimen from Jobie is an exceedingly fine one with a disc measuring 20 mm. in diameter, and a spread of 25 centim. It is remarkable for the great length of its lowest pinnules, the first one reaching 16 mm., and also for the great development of spines on the elongated joints of the middle and later pinnules. Their edges are fringed with strong spines, and a still larger one projects forwards and upwards on each side near the distal end of each joint. Lovén's specimens from Singapore present the same features though to a less extent. They also have a deeper funnel in the centre of the radial pentagon and the centrodorsal sunk in it to nearer the level of the radials. The lower brachials are also more wedge-shaped, and their margins are elevated alternately on opposite sides.

Some large specimens from Cebu in the Philippines which are preserved in the Zoological Museums at Dresden and Vienna also belong to this species. They do not differ much from the type except that the lower pinnules decrease more gradually in size. In the »Challenger" specimen dredged near Fiji the arms are shorter and less fleshy, with less spiny joints, the terminal faces of which are less closely applied than in the type. The basal pinnules are relatively shorter and their joints less spiny; while those of the terminal pinnules are almost smooth and the pinnules stiffer, so that the arms have a less feathery appearance.

A Fiji specimen on the other hand, obtained from the Godeffroy Museum has moderately feathery arms and more

spiny pinnales. As in the »Challenger» specimen and in von Rosenberg's large one from Jobie four of the primary arms consist of but two distichal joints which are united by syzygy as in the later arm-divisions; and it is quite possible that specimens may eventually be met with which have more than half the primary arms in this condition. Variations of a similar character are common in other *Actinometrae* and notably in *Act. parvicirra* but the arm-divisions of *Antedon* are generally much more regular.

Act. typica is the nearest ally of *Act. Novae Guineae*, but the metamorphosis of the centrodorsal is carried much further than in that type, it being markedly stellate in shape and bearing few or no cirrus-sockets. In *Act. Novae Guineae*, on the other hand the centrodorsal bears some 15 functional cirrus-sockets and presents but little departure from the ordinary shape. The joints of the terminal pinnales in *Act. typica* also are much longer and more slender than those of *Act. Novae Guineae*, which are comparatively stout and but little longer than broad. They are also peculiar in having the large lateral spines almost entirely limited to the outer side of each joint, instead of occurring on both sides as in *Act. typica*.

14. *Actinometra robustipinna*, n. sp.

Description of a much mutilated individual.

Centrodorsal a thick disc slightly flattened at the dorsal pole, and bearing about 40 cirrus-sockets in two marginal rows. First radials partially visible all round the calyx, but slightly diverging at each angle so as to leave a gap. This is bridged over by the proximal portions of the short second radials having lateral extensions which meet those of their fellows on either side. Axillaries pentagonal quite free laterally, and rather more than twice the length of the second radials, with moderately sharp distal angles. Rays may divide three times; 17 + arms. Six of the primary arms consist of three distichal joints,

the axillary a syzygy; and in three others there are only two joints, the axillary not a syzygy, the remaining one being broken away. The secondary arms (when present) consist of three palmar joints, the axillary a syzygy. The first pair of joints beyond each axillary are closely united laterally.

The pinnules borne by the second joints after each axillary are enormously large and stout; so much so, that the joints bearing them have almost the appearance of being axillaries themselves. Each pinnule contains 20 + massive joints, the ventral edges of which are produced so as to stand up as plates sloping slightly inwards towards the ambulacral groove. Disc lost.

Colour, light brownish white. Diameter of centrodorsal, 7 m.m.; total diameter between palmar axillaries, 25 mm.

Locality. The Moluccas.

Coll. Macklot.

Remarks. Although no traces remain either of the disc or of a terminal comb on the oral pinnules, the flattened calyx and the wide funnel in the centre of the radial pentagon indicate the generic position of this specimen which is markedly different from most species of *Actinometra* that I have seen.

15. *Actinometra japonica*, Mus. Leyd. sp.

1841. *Alecto japonica*, Müller. Monatsber. d. Berlin. Akad. 1841. p. 186. Wieg. Archiv. 1841. p. 145.

1849. *Comatula japonica*, Müller. Abhandl. d. Berlin. Akad. 1849. p. 260.

1862. *Comatula japonica*, Dujardin. Hist. Nat. des Zoophytes. Echinodermes, p. 205.

Description of an individual.

Centrodorsal wide, discoidal, slightly hollowed in the centre, and concealing the greater part of the radials. About 50 cirrhi of some 20 joints, of which the third is longer than wide and the fifth the longest. The following ones decrease slowly in length, the terminal ones being

deep and much compressed, with small and blunt dorsal spines, that on the penultimate joint not being specially large. Axillaries long with sharp distal angles.

27 + arms; the rays dividing three times. Primary and secondary arms each of three joints, the axillary a syzygy. First joints beyond each axillary only partly united laterally. First and second brachials both bluntly wedgeshaped, the first being the shorter and the more oblong. The next three joints short and nearly oblong; the following ones both longer and wider, wedgeshaped, and overlapping. After about the 15th joint the width decreases and the joints become more oblong, though still overlapping.

First syzygium on 3rd brachial; the next between the 10th and 14th joint; then an interval of 2—4 joints between successive syzygia.

All the lower pinnules are long, especially the first ones on the second distichals which reach about 20 mm. in length. The following ones diminish gradually in length, that on the 6th brachial being a good deal shorter than its predecessor (on 4th br.) though still large. After this the pinnules are stouter and tolerably uniform in length, eventually becoming longer and more slender.

The large lower pinnules have sharp keels on the 6 or 7 basal joints. After the fifth or sixth brachial this carination is confined to the first four joints, dying away altogether after about the 20th arm-joint. The lowest pinnules, as far as the fifth brachials, have terminal combs. Mouth interradial. Disc naked, 25 mm. in diameter.

Spread probably between 15 and 20 centimetres.

Colour light brown, the perisome being darker.

Locality, Japan.

Coll. von Siebold.

Remarks. This is a very well defined species, the axillaries being longer and having sharper distal angles than those of any *Actinometra* I have seen. The great length of the lower pinnules is also remarkable.

On this specimen, which is one of the types examined for Müller by Troschel I found over a dozen *Myzo-*

stomidae. They have been sent to my friend Prof. L. Graff of Aschaffenburg for determination and description.

16. *Actinometra parvicirra*, Müll. sp.

1841. *Alecto parvicirra*. Müll. Monatsber. d. Berlin. Akad. 1841. p. 185 and Wiegman's Archiv 1841. I. p. 145.
1841. *Alecto timorensis*. Müll. Monatsber. d. Berlin. Akad. 1841. p. 186. Wiegman's Archiv. 1841. I. p. 145.
1849. *Comatula (Alecto) parvicirra*. Müll. Abhandl. d. Berlin. Akad. 1849. p. 260.
1849. *Comatula timorensis*. Müll. Ibid. p. 263.
1862. *Comatula parvicirra*. Dujardin. Hist. Nat. des Zoophytes. Echinodermes. p. 206.
1862. *Comatula timorensis*. Dujardin. Ibid. p. 206.
1876. *Actinometra (Comatula) armata*. P. H. Carpenter. Journ. Anat. and Physiol. X. p. 582.
1876. *Actinometra armata*. P. H. Carpenter. Journ. Anat. and Physiol. XI. p. 91.
1877. *Actinometra polymorpha*. P. H. Carpenter. Journ. Linn. Soc. Zool. XIII. p. 439.
1879. *Actinometra polymorpha*. P. H. Carpenter. Trans. Linn. Soc., Sec. Ser. Zool. II. p. 51.
1881. *Actinometra polymorpha*. P. H. Carpenter. Quart. Journ. Mier. Sci. N. S. XXI. p. 185.

After much consideration I have been led to regard Müller's original specimens of *Comatula timorensis* Mus. Leyd. as identical with those described by him under the specific name *parvicirra*.

The two descriptions are on the same page in Vol. I of Wiegman's Archiv for 1841, while in the Berlin. Monatsberichte for the same year *Alecto parvicirra* is described on p. 185, and *Alecto timorensis* on p. 186. Müller says but little about his type specimens of *parvicirra* except that they are in the Paris Museum and that their locality is not known, his specific diagnosis being very meagre

in its character. A specimen in the same Museum which had been obtained by Hombron and Jacquinot at Vavao (Friendly Islands) during the voyage of the *Astrolabe* was regarded by Müller as probably belonging to the same species (*C. parvicirra*). This specimen I found in the Museum under the name *C. brevicirra*, Troschel; while three small specimens from the voyage of Peron and Lesueur, bearing the Museum name of *C. simplex* may possibly be the originals of *C. parvicirra*. The chief difficulty in the way of this identification is the fact that in none of them do the rays divide more than twice, the number of arms being less than twenty; while Müller speaks of twenty-seven arms, the rays sometimes dividing three times. But whether they be his original specimens or not, they are identical with the one from Vavao which he placed under *C. parvicirra* and also with his type specimens of *C. timorensis*. I prefer to retain the former name to designate the species, not because *Alecto parvicirra* appears on p. 185, and *Alecto timorensis* on p. 186 of the Berlin. Monatsberichte for 1841, but because the former really expresses a distinctive characteristic of the type, and has the advantage of not connecting it with any definite locality.

The use of geographical terms as specific titles is often very tempting, but sooner or later the species is found at other localities than the one first recorded, and then the name becomes somewhat misleading. In the case of this species therefore which, for a *Comatula*, has a wide range, the name *parvicirra* has so much more in its favour than *timorensis* has that I prefer to use it, despite the slight uncertainty about the specimens for which it was originally employed by Müller.

The closer examination of the Paris specimens which I made during my second visit to the Museum last autumn, aided by the knowledge gained during four years of pretty continuous study of the *Comatulæ*, has also led me to identify *C. parvicirra* with the series of specimens from the Philippine Islands which I have described under the

name of *Actinometra polymorpha*¹⁾. Both in the Vavao specimen and in the small ones obtained by Peron and Lesueur the arm joints overlap much more strongly than they do in the Philippine examples, the distal edges of the successive joints being much more raised. This is also the case with the original specimens of *C. timorensis* in the Leyden Museum. Müller's description of them gives no information either about the position of the mouth, or about the presence of a terminal comb on the oral pinnules, and is therefore of no use for determining their generic position; and there are other species to which the description that he does give is almost as applicable as to *C. timorensis*.

The chief point of difference between the three Timor specimens and those from the Philippines is that in some of the former the overlap of the arm-joints is much more marked. In one individual indeed it almost ceases to be an overlap and shows the first trace of a carination. The dorsal surface of each joint, instead of sloping gradually upwards and outwards, rises very suddenly towards its distal edge which stands up sharply above the proximal edge of the next joint.

The distichal and palmar pinnules of the Timor specimens are more equal than in the Philippine ones and their terminal comb is smaller, while the outer pinnules of the ungrooved arms are smaller and less fleshy, and bear none of the problematical »sense organs?» which are present in the corresponding pinnules of some of the Philippine individuals.

On the other hand the examples from the two localities agree, not only in their general external appearance, but also in their internal characters. Sections which I have made through one or two pinnules of the Timor spec-

1) Trans. Linn. Soc., Ser. 2. Zool. II. pp. 51—53. I have not thought it necessary to reproduce my diagnosis in these Notes, but confine myself to simply stating the general points of resemblance and difference between the Philippine and Timor specimens respectively.

imens have shown that there is a pigmented cellular cord beneath the watervessel, and lateral trunks connecting the subtentacular and coeliac canals just as in the Philippine examples¹⁾, while the histological features of the ovary are identical in both. The Timor specimens also have several arms which are ungrooved either for the whole or for the greater part of their length. The proportions of ungrooved arms in the three individuals are respectively $\frac{3}{10}$, $\frac{10}{8}$ and $\frac{15}{8}$. The grooved anterior arms taper slowly, having 120 + joints, while in the short hinder arms there are only about 70 joints the last half of which lose the wedgedshaped appearance presented by the lower joints and become rapidly blunter and squarer; but they never become elongated like the terminal joints of the anterior arms.

Another specimen referable to this species is one from Bennett's collection, from some unknown locality in the East Indies. The overlap of the arm-joints is nearly as marked as in the Timor examples, but the spines on the outer cirrhus-joints are less developed and fewer of the lower pinnules have a terminal comb. This individual is remarkable for having dimorphic arms which are all grooved. The posterior arms taper much more rapidly than the anterior ones and are composed of fewer joints, but their ambulacra are nearly as well developed.

Two other examples of the same type were obtained at the Island Solor by Dr. Semmelink. They both agree in the relatively small size of the pinnule on the fourth brachial, and in having the terminal comb on the lowest pinnules larger than in the Timor specimens though the number of pinnules bearing it is small, not more than five or six on each arm. The overlap of the arm-joints also is less marked. While resembling one another in their differences from the type, these two individuals from Solor are nevertheless very unlike.

1) Journ. Anat. and Physiol. X. 1876, pp. 581, 582; XI, 1877, pp. 90, 91.

The smaller one has stiff pinnules which are not well clothed with perisome, while in the other which is but little larger the pinnules of the lower and middle parts of the arm are stout and fleshy, very much as in one of the Ubay varieties of the Philippine series.

The mouth too does not occupy its usual interradial position, and the anus is not quite in the centre of the disc. The arms of both individuals though all grooved, are dimorphic, the posterior ones being shorter and tapering more rapidly.

The Museum contains yet another example of this species. It is a small and immature specimen collected by Hoedt on the south coast of Ceram. The distichal and second brachial pinnules are relatively rather large, the latter being considerably longer than its successor on the third brachial which may be the smallest pinnule on the arm. The overlap of the arm-joints is also but slightly marked.

To this species I would also refer a small 20-armed specimen brought to the Berlin Museum by Prof. von Martens from Kupang, Timor. It is peculiar for the small size of the pinnule on the fourth brachial which is less than half the length of that on the second brachial.

17. *Actinometra alternans*, n. sp.

Description of an individual.

Centrodorsal a pentagonal disc slightly hollowed in the centre, with its angles produced into five blunt processes which are separated from the radials by the outer ends of the basal rays. No cirrhi nor any distinct traces of functional cirrus-sockets. First radials short, below the level of the centrodorsal but not separated from it by distinct clefts; the second much longer and wider, broadly hexagonal, and partly united laterally; axillaries barely half as long again, almost triangular with very open angles. Numerous arms of 150 + joints.

The rays are quite free from the second radials onwards and may divide five or rarely six times, the successive divisions consisting alternately of three joints with the axillary a syzygy, and two joints without a syzygy. The first joints after each axillary quite free or but slightly united laterally. First two brachials about equal in length, nearly oblong; the third (syzygy) longer with its terminal faces sloping obliquely inwards so that the outer side is the longer; the next few joints shorter and bluntly wedgeshaped. The following ones are longer again, more sharply wedgeshaped and overlapping, with slight spines on their distal edges. The overlap is sometimes so marked that the joints seem to have a sharp dorsal keel with spiny edges. After about the 30th joint they are shorter, blunter and more oblong, becoming squarer and less strongly overlapping towards the arm-ends.

First syzygium on 3rd brachial; the next between 12 and 17; then an interval of 3 or 4 joints between successive syzygia.

The second joints after the first (radial), and third (palmar), axillaries bear slender pinnules of moderate length, the first of which is slightly the longer. The next pinnule which is on the second brachial (except when there is a sixth ray-division) is a good deal shorter, and that on the fourth joint still more so. The next six or eight pinnules (5 to 10 or 12 br.) are a little longer, consisting of 15 more massive joints, the lower ones of which are trapezoidal with their outer distal angles produced into short processes. The following pinnules become gradually longer and more slender, composed of longer joints still retaining processes on their outer sides and fringed with small spines. The lower pinnules as far as the 4th brachial have a small terminal comb, which occurs also on some of the larger pinnules immediately following.

Disc lost; diameter across the radials 13 mm.

Spread about 25 centim.

Colour blackish brown. Locality unknown.

Remarks. The specimen described above is a somewhat mutilated one belonging to a type which is entirely different from any hitherto described, and at the same time rather rare. I only know of two other species which present the same curious alternation in the number of joints in the successive arm-divisions.

It is also interesting as showing a stage in the metamorphosis of the centrodorsal which is less advanced than that exhibited by *Actinometra typica*. As in that type the ends of the basal rays are visible externally. The nearest ally of this species is one discovered by Prof. Semper at Pandan near Bohol in the Philippine Islands. It has a thin stellate centrodorsal with traces of cirrus-sockets still visible, but the joints of the arms and pinnules are quite smooth, and there is no sudden increase in the width of the pinnule joints on the lower parts of the arms, while all the lower pinnules are stouter and more fleshy than in *Act. alternans*.

18. *Actinometra Schlegelii*, n. sp.

Description of an individual.

Centrodorsal a thin circular disc, hollowed in the centre and bearing about 20 marginal cirrus-sockets. Cirri lost. First radials almost entirely concealed except for their angles which are rounded, thickened and turned upwards so as to rise somewhat above the level of the rest of the calyx¹⁾. Their distal edges are incurved to receive the convex proximal edges of the trapezoidal second radials which are closely united laterally. Axillaries short, barely half as long again as the second radials, widely triangular and in contact laterally. More than 80 arms, the rays dividing five times; each division of three joints the axillary with a syzygy. Rays and their subdivisions somewhat closely united by plated perisome as far as the palmar

1) The mouth is supposed to be downwards and the dorsal surface upwards.

axillaries, and the apposed sides of contiguous joints are flattened laterally. First joints after each axillary closely united laterally, and the second ones but little separated. First two brachials wide and about equal in length, the second being the more wedgeshaped.

The next two or three joints roughly oblong, and the following ones wide, wedgeshaped, and strongly overlapping, their distal edges being much raised. Arms dimorphic. In the long slowly tapering anterior ones of 150 + joints the joints are wedgeshaped till quite near the end, the later ones being relatively shorter, blunter, and smoother, and the terminal ones squarer elongating just at the end. The posterior arms taper much more rapidly and end after about 120 joints, those of the latter third being very bluntly wedgeshaped and the terminal ones squarer.

First syzygium on 3rd brachial; the next from 9—13 usually on 10 or 11; then an interval of 1—5, usually 3, joints between successive syzygia.

Second joints of all the ray divisions have long and fairly stout pinnules, decreasing rather rapidly to that on the 4th brachial, which is not, however, specially short or slender. The following ones considerably stouter and gradually increasing in length, but decreasing in stoutness after about the 25th joint. Terminal pinnules slender but not unusually long, especially in the posterior arms. The large basal joints of the stout lower pinnules slightly overlap one another; and the lowest pinnules have a moderate terminal comb which disappears after about the 8th brachial. Disc lost; several ungrooved arms. Diameter across the radials 14 mm. Spread probably about 25 centim.

Colour, skeleton brownish white, the perisome darker.

Locality, East Indies?

Remarks. I have much pleasure in connecting this fine species with the name of Professor Schlegel, the accomplished director of the Leyden Museum. Its specially distinctive character is the peculiarity presented by the first radials, which are flush with the second along the middle line,

but are thickened and turned upwards at the angles which appear as five small tubercles around the edge of the centrodorsal. It also differs from *Act. Bennetti* which has a much larger number of cirrhi, in the rays and their subdivisions being more closely united, the arm-joints less spiny, and the lower pinnules more massive.

19. *Actinometra Bennetti*, Mus. Leyd. sp.

1841. *Alecto Bennetti*, Müller. Monatsbericht d. Berlin. Akad. 1841. p. 187. Wiegman's Archiv. 1841. I. p. 146.

1849. *Comatula Bennetti*, Müller. Abhandl. d. Berlin. Akad. 1849. p. 264.

1862. *Comatula Bennetti*, Dujardin. Hist. nat. des Zoophytes. Echinodermes, p. 208.

1866. *Actinometra Bennetti*, Böhlische. Wiegman's Archiv. 1866. I. p. 90.

1879. *Actinometra Bennetti*, P. H. Carpenter. Trans. Linn. Soc., Ser. 2. Zool. II. p. 27.

Centrodorsal large, convex, hollowed in the centre, with two or three irregular rows of cirrhus-sockets on its sides, and its angles produced into short processes above which the ends of the basal rays are sometimes visible. Cirrhi 40—50, of about 25 rather stout joints: the fifth or sixth is slightly longer than broad, the next three or four slightly the longest and the following ones decreasing very gradually, nearly all of them being longer than broad. The terminal joints are slightly compressed and the penultimate has a very faint opposing spine. Portions of the first radials are just visible at the angles of the calyx: the second, which are partially concealed by the large centrodorsal have curved proximal edges and are more or less united laterally; the axillaries broadly pentagonal, with incurved distal edges. 70—80 arms, the rays dividing four or sometimes five times. Each division of three joints, the axillary with a syzygy. The perisome uniting the rays and their divisions, is more or less plated

as far as the third (palmar) axillaries. Arms of 100 + joints. First brachials large, partly united with their fellows, and not quite oblong, their outer sides being slightly the longer: second joints somewhat shorter and more oblong; third (syzygy) square or just longer than wide. The next four or five joints are transversely oblong, their hinder edges having slight backward projections alternately on opposite sides, the following joints longer, rather sharply wedged-shaped, and overlapping with spiny distal edges. Those after the 40th become shorter, blunter, and more oblong and overlap less distinctly.

First syzygium on 3rd brachial; the next between 15 and 18; (17—38, Böhlische) then an interval of 2—5 (7, Böhlische) joints, usually 3 or 4 between successive syzygia.

The second joints of the arm-divisions bear long pinnules; the first two are nearly equal, of 70 joints and nearly 30 mm. in length. The size decreases to that on the second brachial which is not quite half as long as the first (distichal) pinnule. The next five or six decrease rather more rapidly and the following ones increase again. The pinnules as far as the third or fourth brachial have very strong blunt processes on their last 12 or 15 joints; in the next six or eight joints the terminal comb becomes less and less prominent and finally disappears altogether.

Mouth, radial or nearly so; all the arms grooved. A few calcareous granules on the disc, especially round the anal-tube. Diameter of disc 30—35 mm.

Spread about 28 centim. Colour brown or reddish brown.

Locality unknown.

Coll. Bennett.

Remarks. The two specimens on which the above description is based and which were examined by Troschel for Müller, are both considerably mutilated. They differ slightly in the number of cirrhi borne by the centrodorsal and in the extent of its cirrhus-free surface; also in the development of spines upon the arm-joints, and in the extent to which the perisome is plated between the rays.

Müller's description of these two specimens differs somewhat from that given above, as he speaks of every fourth joint in the arm-divisions as being an axillary without a syzygium. There are, it is true, four joints, but the last two of these are united by syzygy as in *Act. japonica* and *Act. parricirra*. Böhlische¹⁾ has already pointed out this mistake of Müller (i. e. of Troschel's) when describing an individual from the Loyalty Islands in the Zoological Museum at Göttingen. There is a similar one from the same neighbourhood (Uea) in the Natural History Museum at Stuttgart, and another from the Pelew Islands in the University Museum at Copenhagen.

20. *Actinometra Peronii*, n. sp.

1816. *Comatula multiradiata*, Lamarck (in part). Syst. d'Anim. sans Vert. II, p. 534.
 1834. *Comatula multiradiata*, de Blainville (in part). Manuel d'Actinologie. p. 249.
 1849. *Comatula (Alecto) multiradiata*, Müller (in part). Abhandl. d. Berlin. Akad. 1849, p. 261.
 1862. *Actinometra multiradiata*, Dujardin (in part). Hist. Nat. des Zoophytes. Echinodermes. p. 210.

Description of an individual.

Centrodorsal a convex disc somewhat hollowed in the centre. Cirrhi 25—30, in two rows, stout and long (sometimes 40 mm.) and composed of about 30 tolerably uniform joints. The joints increase in length up to about the sixth and then slowly diminish, the later ones being somewhat compressed laterally and the penultimate having a faint opposing spine. First radials only visible at the angles where small basals appear; the second planoconvex, barely meeting laterally. Axillaries widely pentagonal with rather sharp distal angles. 66 arms, the rays

1) Wiegman's Archiv. 1866. I. p. 90.

dividing three or occasionally four times; each division of three joints, the axillary a syzygy. First distichals very slightly united laterally, the first joints after the other axillaries rather more closely so. Rays well separated, the perisome between them and that between their first divisions covered with minute plates.

Arms of 150—200 joints, the anterior ones slightly the longer. First two brachials somewhat variable in shape, the first being rather the longer. The third (syzygy) short, oblong or nearly square. The next five or six joints nearly oblong, the following ones gradually becoming short and sharply wedged shaped with slightly raised distal edges. Towards the middle of the arm the joints are shorter and blunter, with finely denticulate edges, and the terminal ones are oblong or nearly square. The distal margins of most of the arm-joints have pointed forward projections alternately on opposite sides.

First syzygium on 3rd brachial: the next from 19—25; then an interval of 3—9, usually 3 or 4, joints between successive syzygia.

The second joints of the arm-divisions bear long pinnules; the first two are tolerably equal, 30 mm. long, with large basal joints. The size decreases rapidly to about the 8th brachial, after which the pinnules are uniform in length for a few joints but gradually become stouter; the following ones slowly increase in length to near the end of the arm, but are always much shorter than the lowest pinnules. These bear a well marked terminal comb which disappears after about the 10th brachial.

The mouth has no very definite position; between it and the anus are a few calcareous granules.

Diameter of disc 35 mm. Spread about 25 centim.

Colour light brown.

Locality. The South coast of Ceram. Coll. Hoedt.

Remarks. I believe this fine specimen to be identical with two others in the Bonn and Paris Museums respectively, which were described by Müller along with another

quite distinct type under the name *Comatula multiradiata* Müll. This specific name was first employed by Linnaeus for various *Comatulæ* (including one in the Retzian collection) which he described, together with the other Starfishes, under the common name *Asterias* ¹⁾. Lamarek ²⁾ also employed it to designate some many-armed *Comatulæ* from the voyage of Peron and Lesueur in 1803; and a remarkable specimen in the Bonn Museum was referred to the same type by Goldfuss ³⁾ who afterwards dissected it. This, however, may be left out of consideration altogether as no example presenting such very remarkable peculiarities as were described by Goldfuss has been met with during the last fifty years, and his type is now generally known by the name *Comaster* ⁴⁾.

The name *multiradiata* is such an exceedingly natural one for a many-armed *Comatula*, that its very general application to any type with more than ten arms is hardly to be wondered at, and the determination of its proper limits is by no means an easy process.

The first steps in this direction were taken by Müller ⁵⁾ who redescribed one of Lamarek's original specimens under the specific name *multifida*, leaving *multiradiata* for the Retzian specimen with which he grouped some *Comatulæ* in the Paris Museum from the voyage of Peron and Lesueur (1803), and a fine specimen brought from the Moluccas in 1829 by Quoy and Gaimard. He also spoke of a specimen in the Bonn Museum by the same name, and said that it »stimmt auch durch den Besitz der Syzygien an den Axillaria der Arme mit *Com. multiradiata* Retz.»

I have been courteously permitted to examine all these specimens at Lund, Paris, and Bonn, a privilege for which I am much indebted to Professors Quennerstedt, Perrier

1) Systema Naturæ, editio decima tertia (Lipsiæ 1788), pars VI, p. 3166.

2) Système d'Animaux sans Vertèbres, 2me Ed (Paris, 1816), Tom. II p. 534.

3) Petrefacta Germaniæ, I (Dusseldorf, 1826—35), p. 202.

4) Journ. Linn. Soc. Zool. Vol. XV. pp. 454—456.

5) Abhandl. d. Berlin. Akad. 1849, pp. 261, 262, 265.

and von Troschel respectively, and I find that Müller's work may be carried a stage farther.

The Bonn specimen and a spirit one from Peron's voyage differ very considerably from the Retzian type. This resembles one of Peron's dry specimens and also that of Quoy and Gaimard from the Moluccas in having but two joints in the secondary and tertiary arms, though there are three joints in the primary arms. In the Bonn specimen on the other hand, and in one from Peron's voyage there are three joints in the secondary and tertiary as well as in the primary arms. But in both types the axillaries are always syzygial or double joints as mentioned by Müller, this being probably the cause which led him to unite them, and at the same time to separate them from Lamarck's other specimen which has no syzygies in the axillary joints (*C. multifida*).

The Leyden specimen which I have described above resembles that at Bonn and its fellow at Paris in having three joints in all the arm-divisions, and I have called it *Act. Peronii*, the Paris example of the type having been obtained in 1803 by Peron and Lesueur.

This type is very similar to *Act. Bennetti* but differs in having fewer cirrhi, and in the joints composing them being tolerably uniform in size. The arm-joints too are relatively shorter, while both the first and the subsequent syzygial intervals are longer than in *Act. Bennetti*; and the pinnules which have stouter and shorter joints are more clothed with perisome.

This specimen was the host of a *Myzostoma* which will be described by Professor Graff.

NOTE XXXVI.

DESCRIPTIONS OF NEW SPECIES OF MELOLONTHINI
AND RUTELINI, COLLECTED IN THE ISLAND
OF SUMATRA DURING THE SCIENTIFIC
SUMATRA-EXPEDITION.

BY

D. SHARP.

1. *Dicheloplia crassa*, n. sp.

Sat convexa, pallide grisescens, supra vage albido-vittata, squamulis acuminatis, suberectis, subtus squamulis setiformibus vestita, antennis rufis, tibiis posterioribus brevibus, crassiusculis. — Long. 7, lat. 4 m.m.

Antennae pale red, 10-jointed, the leaves of the club rather short, about as long as joints 3—7 together. Head short, clothed with pale, erect, narrow, acuminate scales. Thorax convex, much narrowed in front and behind, densely clothed with grey scales, of nearly uniform colour, but these are mixed with darker scales, these latter becoming near the front numerous; the scales are acuminate, suberect and dense, and among them are a very few more elongate pale setae. Scutellum densely clothed with pale scales. Elytra clothed with scales similar to those of the thorax, with a sutural, and two or three other very indistinct stripes a little paler; the scales on these paler stripes are rather coarser than the darker ones. Undersurface densely clothed with a pale, uniform pubescence, consisting

of very long, acuminate scales, or setae. Anterior legs reddish, their tibiae bidentate. Middle legs rather short. Hind legs except the tarsi short, and thick.

The species is remarkable on account of its clothing, which is intermediate between scales and hairs. The tooth, or division, of the posterior claws, is placed at some little distance from the apex.

The specimen described (probably a female) was captured in May 1877 at Loeböckh Tarab.

2. *Apogonia brevis*, n. sp.

Brevis, latiuscula, sat convexa, sine pubescentia, nitida ferruginea, elytris pallidioribus; capite angusto; prothorace lateribus cum basi rotundatis, sat crebre punctato; elytris parce, fortiter, parum profunde punctatis, seriebusque punctorum parum distinctis; tibiis anterioribus conspicue tridentatis, dente intermedio per prominulo. — Long. $7\frac{1}{2}$, lat. $4\frac{3}{4}$ m.m.

Head about half as wide as the thorax, the margin of the clypeus, nearly straight in front, just visibly emarginate however in the middle, the surface coarsely but not densely punctate, the clypeus more densely than the other part. Thorax short, the sides greatly rounded, so that the hind angles have quite disappeared, the front angles rather prominent, but the side not in the least flattened out there, the surface rather coarsely but somewhat sparingly punctate. Scutellum large, with distant punctures. Elytra rather paler than the rest of the surface, sparingly but rather coarsely punctured, and also with some not very distinct series of punctures, viz a sutural rather distinct series, then outside this two series which are moderately close together at the base, but become divergent as they proceed backwards, but again slightly approach one another at the extremity; outside these, just internal to the humeral callus a second pair, parallel and rather approximate but indistinct, and between this pair and the outer margin, a third quite indistinct pair. There are no deeply

impressed punctures near the outer margin. Anterior tibiae short and broad, distinctly tridentate, the upper tooth quite definite, the middle one elongate, and the apical one also elongate and much directed outwards.

A single specimen was captured in May 1877 at Loeboekh Tarab, whereas several (13) specimens were captured in June and July of the same year at Silago.

3. *Apogonia simplex*, n. sp.

Parum lata, sat convexa, sine pubescentia, cupreo-nigra, supra cuprea, pernitida, antennis rufis, pedibus nigricantibus; prothorace parum crebre punctato, lateribus posterioribus cum basi fortiter rotundatis; elytris parum crebre et parum fortiter punctatis, indistincteque bigeminato-striatis; tibiis anterioribus bidentatis, dentibus elongatis; labro sublævigato. — Long. 9, lat. $5\frac{1}{2}$ m.m.

Head rather narrow, densely and coarsely, almost rugosely punctate, its surface a little uneven, the clypeus faintly emarginate in front. Thorax but little narrowed behind, but with the hind angles extremely rounded, the anterior angles but little prominent, the surface rather sparingly punctate. Scutellum very sparingly punctured. Elytra rather sparingly punctate, with a sutural series of punctures, and with a series of distant punctures on the sutural interstice, between this and the shoulder with a widely separated pair of series of punctures, and with their interstice sparingly punctate, just internal to the shoulder with a second pair of series of punctures, their interstice bearing a series of a few distant punctures, near the outer margin the punctures are also arranged in series. Labrum destitute of large punctures.

Two specimens in 1878 in the district of Rawas: one of these in May, the other (at Soeroelangoen) in July.

This species is found also at Malacca.

4. *Apogonia fulgida*, n. sp.

Lata, sat convexa, sine pubescentia, nigro-cuprea, supra cupreo-aenea, fulgida, antennis rufo-obscuris; pro-

thorace brevi, parum crebre punctato, lateribus posterius cum basi fortiter rotundatis; elytris sat crebre et sat fortiter punctatis, indistincteque bigeminato-striatis; tibiis anterioribus gracilibus, apice bidentatis, dentibus parum prominulis, margine exteriori superne quasi crenulato. — Long. $10\frac{1}{2}$, lat. 7 m.m.

Head much narrower than the thorax; clypeus rounded in front, and almost completely without emargination in the middle, coarsely and densely punctured, forehead rather coarsely and not densely punctured. Thorax short, the sides much rounded behind so that the hind angles have completely disappeared, the front angles rather prominent, the surface rather coarsely, moderately closely punctured, the punctures on the middle finer and more distant. Scutellum sparingly and obsolete punctured, sometimes almost without punctuation. Elytra not closely punctured, the punctuation more distant near the suture, the sutural series of punctures not very distinct, and its interstice bearing a series of punctures, two indistinct series of punctures between the suture and the shoulder, the two being widely separated, and their interstice punctured, just inside the shoulder is a second pair of series of punctures, but this pair is not readily distinguished, and its interstice bears a series of punctures, the punctures near the outer margin are more regular and deeper. The legs are rather long and slender. The labrum bears numerous conspicuous coarse puncture

The species varies somewhat in colour, the coppery tinge of the uppersurface being sometimes not very remarkable.

Two specimens in April 1877: one at Soepajang, the second at Solok; a single one in May at Ajer Boesoeck; two in June and one in July at Silago, and two in November at Moeara Laboe.

5. *Apogonia scutellaris*, n. sp.

Convexa, punctatissima, sine pubescentia, subopaca, nigra, elytris cupreo-nigris, antennis rufis; scutello dense

punctato; tibiis anterioribus submuticis obsolete bidentatis. — Long. 9, lat. 6 m.m.

Head very densely punctured, margin of clypeus faintly emarginate in front. Thorax densely, deeply, and regularly punctured, the sides but little rounded behind, the hind angles obtuse. Scutellum densely punctured, moderately large. Elytra very densely, deeply and regularly punctured so that the longitudinal series of punctures are rendered indistinct, near the outer margins however the punctures are separated by two or three distinct longitudinal interstices. Pygidium very deeply punctate, the punctures bearing short pale setae. Undersurface densely punctate. Anterior tibiae rather elongate and slender, the apex inconspicuously bidentate.

The dense punctuation of the scutellum distinguishes this from all other species that bear no clothing on the upper surface.

Only a single specimen (the described one) was captured in April 1877 at Soepajang.

6. *Apogonia setulosa*, n. sp.

Lata, convexa, fuscula, obscura, in thorace et pectore vix metallescens, opaca, densissime punctata, breviter setulosa; tibiis anterioribus submuticis. — Long. 10, lat. 6 $\frac{2}{3}$ m.m.

Clypeus rounded in front; head densely and coarsely punctured, the clypeus not more densely but even slightly less densely than the rest of the surface. Thorax rather narrower than the elytra, with the hind angles not rounded, but very obtuse, the surface is excessively densely punctured, the punctures being in fact somewhat confluent in the longitudinal direction, like the rest of the body it bears short, erect, rather scanty, pale setae, and has a faint metallic lustre. Scutellum very densely punctured. Elytra very coarsely and densely punctate, so that the series of punctures, can scarcely be traced, the punctuation near the outer margin differs but little from that

of the other parts. Undersurface densely punctate. The anterior tibiae are rather elongate and slender, and almost without tooth on the outer margin.

The individual described which was captured at Padang, is in very bad condition, the hind legs and the greater part of the antennae being absent.

7. *Lachnosterna sumatrensis*, n. sp.

Elongata, parallela, supra opaca, pruinosa, opalescens, subtus rufo-testacea; antennis pedibusque rufis, pectore piloso, capite lato, clypeo in medio leviter emarginato; prothorace lato, sat crebre punctato, margine laterali anteriori serrato, posteriori integro; elytris conspicue costatis, inter costas evidenter punctatis. — Long. 23, lat. 11 m.m.

Antennae 10-jointed, the 4th joint angulate in front, the 5th acutely angulate, the 6th and 7th very short, with elongate prolongations, club rather elongate (2 m.m. long). Clypeus rounded on each side, somewhat emarginate in the middle in front: the surface of the head approaches to black in colour, is opaque coarsely, evenly, moderately closely punctured, the clypeal suture deep, slightly sinuate in the middle, the vertex without any transverse elevation. Thorax about as broad as the elytra, the hind angles very obtuse but quite distinct, the front angles but little produced, the lateral margin is rather fine, and from the front to behind the middle is interrupted here and there, a seta being planted in each interruption, these about eight or nine in number; the surface somewhat sparingly and finely, but quite distinctly punctured; scutellum rather sparingly punctured, the punctures wanting about the middle. Elytra not so dark in colour as the head and thorax, reddish, but with a varying glance, either purplish and dull, or opalescent, with the longitudinal costae broad and distinct, between the costae sparingly punctured. Anterior femora with the free basal extremity elongate; lower spur of hind tibiae much dilated at the extremity.

The specimen described (captured in March 1877 at Soc-pajang) is probably a male; the species is not at all closely allied to any other known to me; perhaps it comes near to (*Holotrichia*) *puberina* Blanch., if I may judge from description.

8. *Lachnosterna pumila*, n. sp.

Suboblonga, angustula, rufescens vel picescens, antennis pedibusque rufis, fortiter fere dense punctata, haud opaca; pectore nudo. — Long. 10—11, lat. $4\frac{2}{3}$ — $5\frac{2}{3}$ m.m.

Antennae 10-jointed, but with the 3rd, 4th and 5th joints anchylosed, the 6th and 7th without distinct prolongations, the club rather small. Head small, the clypeus rather deeply emarginate in front, with the lateral angles completely rounded, the surface coarsely and densely punctate, a little shining, the punctures on the clypeus not quite so dense as on the hinder part; the vertex indistinctly angulate. Thorax strongly transverse, its greatest width about the middle, the hind angles obtuse but distinct, the front angles nearly rectangular, slightly obtuse, very little produced, the lateral margin fine, with two or three very minute indistinct interruptions in front of the middle, the surface coarsely and closely punctured, but the interstices shining. Scutellum with a very few punctures. Elytra coarsely and rather closely punctate, so that the costae can, with the exception of the sutural one, scarcely be detected. Pygidium coarsely and closely punctured. Undersurface without pubescence, the breast punctate, its sides opaque, the middle shining; ventral segments equally but somewhat distantly punctured, opaque at the sides, shining in the middle. Spurs of hind tarsi rather slender, acuminate.

One specimen from Silago (July 1877), and three specimens from the district of Rawas: two in May 1878, the third (from Soeroelangoen) in July of the same year.

This species is found also in Java. The specimens from

Sumatra do not differ in any important respect from those from Java. The mentum in this species is small, and is very deeply impressed along the middle; the tooth of the claws is very large, and curved, it is indeed even larger than the apical portion of the claw, to which it is similar in form. *Rhizotrogus exactus* Walk. from Ceylon is I believe an allied species. A still more closely allied, but distinct, species occurs in Borneo (Sarawak).

9. *Lachnosterna barbata*, n. sp.

Sat elongata, posterius latior, supra opaca, pruinosa nigricans, elytris sanguineo-nigris, pectore villosa, abdomine pallido, antennis rufis. pedibus piceo-rufis; clypeo anteriori emarginato; prothoracis margine laterali vix interrupto; elytris late sed obsolete costatis. — Long. 20, lat. 9 m.m.

Antennae 10-jointed, 5th and 6th joints angulate in front, 7th with a short prolongation, club quite small. Head much narrower than the thorax, the surface coarsely and closely punctate, clypeus moderately long, emarginate in front in the middle, its margin but little reflexed. Thorax rather narrower than the elytra, a good deal broader in the middle than in front and behind, the hind angles very obtuse, the surface moderately closely punctured and quite dull, the punctures more scanty on the middle, each puncture is sharp and well defined in front, but is not so definitely limited but rather as it were slightly prolonged behind, so that at the sides where they are most dense there is a slight strigose appearance; the lateral margin about the middle almost severed by three or four setigerous punctures. Elytra somewhat sparingly and not coarsely punctate, and with broad, impunctate, but scarcely elevated costae. Pygidium closely punctate. Ventral segments finely and sparingly punctured. Spurs of hind tibiae rather broad.

This is an ordinary species in appearance, but has the

parts of the mouth furnished with very long setae; the very deeply cleft labrum has on each side very long setae, the base of the mentum in the middle has a large puncture bearing two very long setae, and on the middle has two shorter setae, the sides of the mentum are on a different plane to the middle and are coarsely punctate, and bear very long setae. The base of the front femur is entirely without any prolongation.

A single specimen was captured in May or June 1878 in the Highlands of Palembang.

10. *Lachnosterna gravida*, n. sp.

Robusta, piceo-rufa, capite thoraceque piceis, abdomine dilutiore, nitida, dense punctata, pectore pubescente; clypeo in medio emarginato, utrinque rotundato, vertice carinato; prothoracis margine laterali tenui integro, lateribus ad angulos anteriores, parum explanatis. — Long. 27, lat. $12\frac{1}{2}$ — $13\frac{1}{2}$ m.m.

Head densely and coarsely punctate, and consequently but little shining, the vertex strongly carinate, behind the carina densely and rather finely punctate. Thorax rather large, broad, the base slightly sinuate on each side near the hind angles so that these are very obscurely produced backwards, but they are very obtuse, almost rounded, the surface is densely punctate, the punctuation being especially dense on the front, towards each side there is a space on which the punctuation is scanty or absent. Scutellum with a patch of punctuation on each side. Elytra shining, at the base rather closely, towards the apex more sparingly punctured, with narrow indistinct costae, and with the suture more broadly raised. Pygidium moderately close punctured. Second joint of posterior tarsi not quite so long as the basal one.

This species is closely allied to the Javanese *Melolontha leucophthalma* Wied., but it is more closely and finely punc-

tate, and the sides of the thorax are less explanate at the front angles.

Two specimens were captured in January 1878 at Soerian.

11. *Lachnosterna convexa*, n. sp.

Elongata, fere angustula, subparallela, transversim valde convexa, dense punctata, subnitida, pectore breviter hirsuto; clypeo in medio fortiter emarginato, utrinque subrotundato, vertice carinato; elytris fere ecostatis. — Long. 19, lat. 9 m.m.

Head closely punctate, the vertex strongly carinate, behind the carina almost impunctate, clypeus rather broadly, and somewhat deeply emarginate in the middle, the lobes on each side of the emargination nearly but not quite rounded. Thorax broad, dilated at the sides in the middle, the base scarcely sinuate on each side, the hind angles rounded, the lateral margin scarcely distinctly crenulate, and not distinctly explanate in front, the anterior margin truncate, the surface very densely, evenly, and not coarsely punctured. Scutellum punctate. Elytra closely punctate, the punctuation not so dense towards the apex as at the base, appearing almost without costae, but the lateral one distinct, the sutural one, broad, but little elevated, punctate and so indistinct. Ventral segments somewhat coarsely punctate; breast with short pubescence; base of anterior femora with short, free angular prominence; hind tibiae coarsely punctate externally; 2nd joint of hind tarsi as long as the preceding one.

This species appears intermediate between *Melolontha leucophthalma* Wied. and *Ancylonycha bidentata* Burm.

A single specimen, captured in April 1878 at Socroelangoen, has been brought home by the Expedition.

12. *Lachnosterna discedens*, n. sp.

Crassiuscula, parum elongata, convexa, nigro-picea,

elytris dilutioribus, nitida, pectore haud villosa, subtilius squamoso; capite brevi, clypeo in medio emarginato, vertice carinato; elytris nitidis, fortiter punctatis, sat distincte costatis; prosterni processu post-coxali libero erecto, apice subemarginato. — Long. 20, lat. 10 m.m.

Antennae 10-jointed, the club appearing 5-jointed in consequence of the 6th and 7th joints being provided with prolongations as long as the leaves of the club, the 5th joint also with an angular projection from the front. Sides of the mentum much raised, bearing elongate, erect setae. Head short, and broad, the vertex strongly carinate, the clypeus a good deal emarginate in the middle in front, the surface coarsely and closely punctate. Thorax broad, front angles obtuse, hind angles very obtuse, lateral margin fine, crenulate, surface rather coarsely somewhat sparingly punctured, the punctures rather irregularly distributed. Scutellum punctate. Elytra rather coarsely punctate, the punctures so formed and placed that when magnified they give rise to an obscure appearance of the surface being transversely rugose, the costae rather narrow and somewhat indistinct, the sutural costa broad and very little elevated, punctured. Pygidium broad, coarsely punctate. Breast furnished at the sides with depressed scales, instead of hairs. Anterior femora with very short free angular prominence behind.

I have preferred in the present condition of the genus *Lachnosterna*, to place this insect therein, rather than to give it a distinct generic name; the structure of the antennae and of the prosternal process will allow it to be identified with ease.

One specimen in March 1877 at Agam, several ones (7) in January 1878 at Padang, and one in May 1878 in the district of Rawas.

13. *Lachnosterna marmorata*, n. sp.

Elongata, fusco-rufa, subopaca, antennis pedibusque

rufo-testaceis, corpore squamulis minutissimis, supra parcius, subtus crebrius adperso; elytris vix inaequalibus, coloribus indeterminatis marmoratis. — Long. 28, lat. 13½ m.m.

Antennae 10-jointed. Head rather small, of a dark vinous red colour, coarsely punctate, the punctures rather widely separated, and each bearing a very minute pale scale; clypeus not in the least emarginate in the middle, on the contrary with a tendency to form a very slight minute projection there. Thorax similar in colour to the head, and punctate and squamose in a similar manner, with the sides not greatly rounded, broader at the base than in front, the hind angles obtuse, the base scarcely sinuate on each side near the hind angles. Scutellum large, with a few squamigerous punctures, and at each angle in front with a very small patch of minute white scales. Elytra of a very peculiar vinous red colour, the colour forming very irregular transverse patches of different shades, the surface not quite even, but with the paler portions slightly depressed, the very minute scales are placed rather more densely on the pale portions, and so increase the appearance of irregularity, before the apex there is a waved mark more conspicuous than the rest, there are no elevated costae, and the waved marks do not extend to the sides. Pygidium with very minute white scales. Undersurface more closely clothed than the upper with pale scales. Breast without pubescence. Legs yellowish red, elongate and rather slender. Anterior tibiae tridentate.

This remarkable insect will no doubt form a distinct genus, but in the present extremely unsatisfactory condition of the classification of the larger Melolonthini it is not desirable to make isolated new genera. The following however are some of the peculiarities which distinguish it, independently of its remarkable colour and appearance, from the ordinary Lachnosternae. Labrum rather prominent, its dependent front margin with very largely developed ciliae. Mandibles projecting at their extremity as a rounded plate; extremity of labium greatly notched on each side, so that

the front margin stretches outwards on each side as an acute, slender angle. Middle and hind tibiae with a single short carina in the middle, without the least trace of a second, upper carina; outer hind angle of posterior coxae rounded.

A single specimen captured by Mr. I. C. van Hasselt at Boenga Maas, province of Palembang.

14. *Lachnosterna miranda*, n. sp.

Parum elongata, squamis pallidis crebre adspersa, nigricans, elytris rufo-nigris, pruinosis, costatis; antennis pedibusque piceis. — Long. 20, lat. $10\frac{1}{2}$ m.m.

Clypeus quite rounded in front; surface of head dull, rather sparingly, and coarsely punctured, each puncture bearing a small very pale yellow scale. Thorax narrower in front than at the base, front angles rather prominent, hind angles very obtuse, surface quite dull nearly black, covered not very closely with punctures each of which bears a fine pale scale. Scutellum also squamigerous, the scales on each side in front denser so as to form a small patch. Elytra with an obscure reddish tint, opalescent or pruinose in a certain light, regularly covered with squamigerous moderately distant punctures, and each with a sutural and four other costae, which although but slightly elevated, are rendered more distinct, by the presence of some larger pale scales, very distant from one another. Undersurface clothed moderately closely with pale scales; breast pubescent, squamose at the sides. Legs moderately long; front tibiae tridentate; middle and hind ones unica-
 rinate; middle and hind legs clothed with pale squamiform setae, not scales.

This is another very peculiar species, agreeing with *Lachnosterna marmorata* and *Lepidiota gracilipes* Sharp in the horned condition of the front of the labium, so that the three might be united in one genus by this character and the squamigerous surface. *L. miranda* agrees with

L. marmorata in the prominent labrum; and in the fact that the prosternum is slightly protuberant in immediate contiguity with the coxae, with *Lepidiota gracilipes*.

The described unique specimen was captured in March 1877 at Soepajang.

15. *Tricholepis vestita*, n. sp.

Nigricans, supra fusco-rufa, pube tenue depressa sat dense vestita, parum nitida, abdomine segmentis 2—4 medio nudis, antennis pedibusque picco-rufis; elytris callo apicali distincto. — Long. 32—38, lat. 15½—19 m.m.

Closely allied to *Rhizotrogus grandis* Cast. (*Ancylonycha puberina* Bldh), but a little larger, and distinguished by the coarser punctuation, and more scanty clothing. Clypeus not emarginate in front. Prothorax closely and not altogether finely punctured, closely clothed with very fine short hairs, which however allow the punctuation to be detected. Elytra at the base densely punctured, towards the apex with a scanty punctuation, the punctuation at the base is quite fine, but towards the apex it is coarse although of a peculiar nature, each puncture being in fact a kind of indefinite impression; at the base where the punctuation is dense there is a dense clothing of short pale hairs like those on the thorax, but towards the apex, this clothing becomes scanty so as to allow the shining surface to be perceived. The undersurface is clothed in a similar manner to the upper, except that the middle of the ventral segments is bare, and on the breast the hairs are fine, rather longer and less regular.

One specimen was captured in April 1877 at Soepajang a second in the same month at Solok, a third in May 1877 at Loeboekh Tarab and a fourth at Boenga Maas.

In one of these four individuals (that from Boenga Maas, and captured by Mr. I. C. van Hasselt), the punctuation and clothing of the elytra become still more scanty than

in the others, so that it has almost the appearance of being a distinct species.

16. *Leucopholis cingulata*, n. sp.

Subtus nigricans, supra brunnescens squamis niveis dense vestita, elytrorum marginibus lateralibus nudis; subtus lateribus densissime niveo-squamosis, pectore lateribus tenuiter pubescentibus, medio cum pedibus abdomineque parce squamoso. — Long. 32, lat. 18 m.m.

Antennae pitchy; clypeus scarcely emarginate in the middle; surface of the head rather coarsely punctured, covered with white scales (in the only specimen before me the scales are absent from the middle of the head but this is probably the result of abrasion). Thorax sinuate at the base on each side with the hind angles acute, and prolonged a little backwards outside the shoulders of the elytra, the front angles prominent and acute, but quite short, the surface rather coarsely punctate, but quite covered with white scales. Scutellum and elytra densely covered with white scales, but the latter with a lateral band free from scales. Pygidium densely clothed with white scales which are smaller and narrower than those on the elytra. Sides of the body beneath densely clothed with white scales forming a conspicuous lateral band.

This species is not at all closely allied to any other known to me, but may perhaps be allied to *L. lactea* Burm., and *L. molitor* Burm. with which I am unacquainted. The individual described is no doubt a female; the anterior tibiae are bidentate, and the mesosternal process is quite short, and stout.

It was captured in September 1877 at Alahan pandjang.

17. *Anomala sordidula*, n. sp.

Parvula, testacea, prothorace tarsisque rufescentibus,

illo plagis duabus plus minusve indistinctis fuscis; elytris circa suturam infuscatis, indistincte punctato-striatis, interstitiis punctatis, setulis erectis sat crebre munitis. — Long. 7—8 m.m.

This is one of the smallest and most obscure species of the genus, and has the appearance of a Melolonthid rather than of a Rutelid. From the structure of its claws it should be placed in Burmeister's subgenus *Rhinoplia*. The head is pale, the eyes moderately large, the surface rather closely and coarsely punctured. The thorax is quite shining, moderately coarsely and not closely punctured, on each side of the middle is a variable, indistinct, darker mark. The elytra are more or less broadly infuscate along the suture, the punctures are arranged in rather indistinct rows, and the interstices are rather irregularly punctate, from each puncture there springs a fine hair. The legs are rather slender; the front tibiae bidentate; on the front and middle feet the larger claw is distinct bifid at the apex; the claws of the hind feet are comparatively little unequal. The sexual distinctions are very slight.

Described from individuals found at Perak. The Dutch expedition found only three specimens (in May 1878 in the district of Rawas); they are rather more elongate than the Perak specimens, the elytra have no infuscation along the suture, and their punctuation is rather more regular and distant.

18. *Anomala rotundiceps*, n. sp.

Pallide testacea, capite picea, antice diluitor, elytris anguste nigro-cinetis, prothorace in medio nigro-bimaculato; clypeo anteriori omnino rotundato; elytris conspicue punctatis. — Long. 16 m.m.

This species may be placed near Burmeister's *A. fraterna* and *dorsalis*, which form his subgenus *Heteroplia*, but it is distinguished from the species just named by the completely rounded front of the head; this is of a pitchy colour

but becomes much paler in front, it is coarsely and rugosely punctured, but the punctures on the vertex are much more distant than they are in front. The thorax is shining, and is moderately coarsely, rather sparingly punctured, in the middle is a more or less distinct dark mark, divided in the middle so as to form two or more nearly united spots. The scutellum is finely and sparingly punctured and is margined with black. The elytra are also narrowly margined with black, and may have a humeral and sub-apical black spot, they are very distinctly punctured, the punctures consisting of a sutural series, and four or five pairs of lines of punctures, the spaces between these are also punctate, so that the serial punctuation is not very distinct. The pygidium is rather coarsely and sparingly punctured. The hind legs are rather short and stout, their tibiae are infusate at the extremity, and the tarsi also are darker; the tibiae are a good deal dilated in front of the middle, and bear externally only a single transverse carina. The front tibiae bidentate without trace of a third tooth.

Two specimens: one from Silago (July 1877), the other from the district of Rawas (May 1878).

A specimen from Sarawak agrees with one from Sumatra (the Silago specimen), except that it is narrower, and has the black spots on the elytra distinct; the second individual from Sumatra (the Rawas specimen), has the elytra less distinctly punctured, and the hind tibiae have the rudiments of a second carina on the outside.

19. *Anomala breviceps*, n. sp.

Parvula, testacea, nitida, elytrorum sutura angustius infusato; capite crebre, haud rugulose punctato, oculis majoribus; prothorace crebre punctato; elytris fortiter regulariterque lineato-punctatis; pedibus crassiusculis, tarsis posterioribus piceis. — Long. 10 m.m.

Allied to *A. ypsilon*, and *A. communis*, but of only half

their size. Antennae testaceous, with elongate club. Head short, with convex eyes, the surface rather coarsely punctate, but the punctures not confluent. Thorax rather coarsely, moderately closely punctured. Scutellum sparingly punctate. Elytra yellow, with the suture narrowly and indistinctly paler; they have very distinct regular lines of punctures, the interstices being, with the exception of the outer ones, destitute of punctures. The pygidium is coarsely, rather closely punctured. The breast is almost without setae; the ventral segments rather coarsely punctate. The legs including the tarsi are rather stout; the front tibiae are tridentate but the upper tooth is indistinct. The hind tibiae have two carinae on their outer face.

Three specimens have been brought home, one captured in March 1877 at Fort de Kock, a second in July of the same year at Sidjoendjoeng, the third at Padang.

20. *Anomala fuscula*, n. sp.

Fusco-aenea, nitida, pectore piloso, antennis rufis; prothorace crebrius punctato; elytris dense punctatis, punctis subregularibus, haud striatis; pygidio opaco, ruguloso, parce piloso. Ex affinitate *A. sulcatulae* Burm., sed corpore supra minus dense et profunde punctato. — Long. 13—15 m.m.

Rather narrow; head and thorax brassy, coarsely and closely punctured, the punctures more distant on the middle of the thorax; scutellum rather finely and sparingly punctured. Elytra densely punctured, the punctuation having a somewhat regular appearance, and yet not consisting of regular series, or striae, of punctures, about the base and along the suture, the punctuation is less coarse and dense, but towards the sides it becomes somewhat rugulose; the colour is rufescent or fuscous, with a strong brassy reflection. The pygidium is densely rugose, and bears fine, short, pale hairs, becoming longer towards the hind margin. Beneath the breast bears a dense pale pubescence, which however leaves the middle bare; the lateral accumu-

lations of setae on the ventral segments are conspicuous. The front tibiae are slender with elongate apical, and obsolete middle tooth. The hind tibiae are very coarsely punctate externally.

This species appears to differ from *A. sulcatula* only by the sculpture. It occurs also in Java, from whence it was procured by Dr. Horsfield.

Several individuals have been brought home by the Sumatra-Expedition: two from Silago (June and July 1877), four from Moeara Laboe (November 1877), two from Loeboekh Gadang (December 1877) and one from the district of Rawas (May 1878).

21. *Anomala chalcites*, (Dej.) n. sp.

Ex affinitate *A. viridis*, sed multo minor. Supra viridis, nitida, subtus cum pedibus rufo-cuprea, tibiis posterioribus tarsisque obscurioribus, metallescentibus; elytris aequaliter, sat fortiter, vix crebre punctatis; pygidio viridi, dense aequaliterque ruguloso, opaco, nudo. — Long. 18—21 m.m.

Above of an uniform, rather dark green colour; head rugosely punctured in front, more sparingly on the vertex. Thorax shining, very distinctly, evenly, moderately closely punctured; scutellum punctured like the elytra. Elytra distinctly and evenly, but not densely punctured, quite shining, the serial punctures similar to the others, and thus indistinct, although their linear arrangement allows them to be perceived. Pygidium entirely dull green, densely and evenly rugose, quite dull, and without any pubescence; the exposed part of the propygidium also dull green. Undersurface entirely rufous, more or less distinctly tinged with brassy; the posterior tibiae and tarsi always darker and more metallic than the rest of the legs.

Specimens from Silago, Moeara Laboe, Loeboekh Gadang, Peak of Indrapoera (at an altitude of about 1000 M.), Padang and the district of Rawas. A specimen of a

variety in which the elytra are more strongly punctured was captured in April 1877 at Solok.

This appears to be a common species, and is found in Java and Borneo, as well as in Sumatra: Dejean's specimens are labelled as being from the former of these localities. Burmeister's few words of description of *A. semipurpurea* (*Handbuch* IV, 2, p. 505) can scarcely apply to this species.

22. *Anomala flagellata*, n. sp.

Ex affinitate *A. bicoloris* Burm. et *A. xanthopterae* Blehd.; supra viridis, plus minusve testaceo-diluta, nitida, fortiter punctata, pygidio fere opaco, dense subtiliter parum profunde ruguloso, parce piloso; subtus (cum pedibus) testaceovirescens, antennis rufescentibus, flabello (in mare) elongato. — Long. 16—17 m.m.

This is of the size and form of *A. xanthoptera* Blehd. It is of a green colour but more or less diluted with testaceous, so as to have in some lights a more or less purple appearance, below yellow, more or less tintured with green; the colour no doubt a good deal variable. Head green, its punctuation coarse, dense and rugose. Thorax rather coarsely and closely, evenly punctured. Elytra rather rough, the punctuation being uneven so as to cause in some parts rugosities, and the serial punctures, though only indistinct, more or less deeply impressed, so as to give rise to an obscure appearance of striation. On the undersurface the setae and pubescence of the breast and legs are, as in *A. xanthoptera*, rather longer and more conspicuous than in the allied species.

The four individuals are all males, and have the club of the antennae of unusual length, viz 2½ m.m. They were captured in September and October at Alahan Pandjang.

23. *Anomala chalcescens*, n. sp.

A. cupreae Hope colore subsimilis, sed multo brevior; nigro-

aenea sat nitida, crebre punctata, elytrorum punctis seriatis sat conspicuis; antennis rufo-piceis; pygidio opaco, nudo, dense, aequaliter, parum fortiter ruguloso. — Long. 17 m.m.

Very similar in form to the European *A. vitis* (*A. aenea* Mun. Cat.) but a little smaller, and similar in colour to the Japanese *A. cuprea*. Head very densely but not coarsely punctured. Thorax shining, very evenly, but neither closely nor coarsely punctured. Elytra with the rows of punctures distinct, though not differing much from the interstitial punctuation, this latter similar to that of the thorax; the epipleural margin distinct till it reaches the propygidium, the membranous border rather broad as in *A. vitis*; by this character the species may be considered intermediate between *A. severa* Burm. and *A. cuprea* Hope.

Five specimens have been brought home: one was captured in March 1877 at Agam, an other in the same month at Paja Koemboeh, and three in May 1878 in the district of Rawas.

24. *Mimela debilis*, n. sp.

Pallide testacea, vix metallescens, prothorace crebre punctato; elytris seriebus regularibus circiter decem punctorum, interstitio primo solum punctato. — Long. 9—11 m.m.

Antennae entirely pale, with rather short club. Head coarsely punctate in front, the vertex coarsely punctate. Thorax yellow, but more distinctly tinted with a golden or metallic reflection than the rest of the surface, moderately coarsely and closely punctured. Elytra with ten or eleven rows of rather coarse punctures, which are somewhat deeply impressed so that the interstices are a little convex, the first of these interstices bears on the basal portion an irregular punctuation which ceases before the extremity. Pygidium coarsely punctate. Breast only very sparingly pubescent. Legs rather short and stout, pale yellow, except the tarsi, which are more or less infusate or obscure.

I am not aware that any species nearly allied to this has been yet described, but I have three or four closely allied forms from other localities in Asia and Malasia.

Three specimens from Padang and one from Doesoen Tengah (November 1877).

25. *Popilia foveolata*, n. sp.

Nigra, nitida, pedibus pygidioque colore variabilibus, interdum rufis; subtus conspicue albido-setosa, pygidio basi utrinque macula parva albida; elytris quadrifoveolatis, seriebus punctorum subtilibus. — Long. 8—8½, lat. 5 m.m.

Head black, clypeus strongly margined, densely rugose-punctate, vertex sparingly punctured. Thorax black, but with a more or less indistinct red spot on each side, very shining, at the front and sides with some coarse punctures, and just within the lateral margin with a very few white setae. Elytra shining black, with a very large impression on each near the scutellum, and a second smaller, but very distinct, at the shoulder, and with six or seven more or less incomplete rows of somewhat obsolete punctures. Pygidium sparingly rugose, sometimes nearly black, sometimes nearly red, at the base on each side with a small but distinct patch of white hairs. Undersurface and femora with conspicuous white setae arranged in the usual manner. Hind legs short and very stout, their tarsi unusually short; the femora and tibiae are sometimes reddish yellow, sometimes nearly or quite black.

This distinct species may be placed near *P. adamas* Newm.

The eleven specimens brought home by the Expedition were captured at Paja Koemboeh and Agam (March 1877), Silago (July 1877), Moeara Laboe (November 1877), Loeboekh Gadang (December 1877), in the district of Rawas (May 1878) and at Koctoer (June 1878).

Found also at Sarawak in Borneo, by Marquis Doria in 1865—6: the specimen from there quite agrees with a series from Sumatra.

26. *Parastasia nigripennis*, n. sp.

Brevis, nitida, rufa, capite, elytris, trochanteribus, tibia-rum apicibus tarsisque, etiam tibiis anterioribus externe nigris; prothorace elytrisque subtiliter punctatis, pygidio longius piloso. — Long. $12\frac{1}{2}$, lat. $6\frac{1}{2}$ m.m.

Head black, in front coarsely but not deeply punctate, clypeal margin reflexed, obscurely bidentate. Thorax shining, red, sparingly and rather finely punctate. Scutellum red almost impunctate. Elytra blue-black, shining, with numerous series of fine almost obsolete punctures, the first and second series rather widely separated and their interstice with numerous irregularly placed, similar punctures. Pygidium tawny-red, dull, with erect, elongate, yellow pubescence. Beneath red, with the trochanters black, the breast with rather dense yellow pubescence. Legs red, the knees with a very small black spot, the apices of the tibiae black, as also are the tarsi. Middle tarsi very stout, their anterior claw, with large very stout tooth.

A single specimen captured by Mr. I. C. van Hasselt at Boenga Maas, province of Palembang.

27. *Parastasia sordida*, n. sp.

Brevis, opaca, dilute brunnea, thorace elytrisque vage fusco-signatis, subtus fusco-brunnea, pedibus testaceis; prothorace magno, fortiter punctato; elytris fortiter, sub-obsolete, seriatim punctatis, punctis ocellatis. — Long. 11, lat. 6 m.m.

Head very coarsely punctate, the clypeus in front with two very short reflexed teeth, mandibles prominent, with broad extremity, but prominent acute outer angle. Thorax large very dull, with numerous indefinite dark marks, and with numerous coarse deep punctures. Scutellum impunctate. Elytra with rows of large, but not deeply impressed punctures, each of which has a large central spot;

not only are the punctures thus ocellated, but when highly magnified it is seen that the central spot of each itself consists of an elevated portion surrounded by a margin; the wing cases are of a brownish or cinnamon colour, and have behind the scutellum an indistinct transverse dark mark extending forwards on each side towards the shoulder. Pygidium very coarsely punctured especially towards the extremity.

A single specimen from the district of Rawas (May 1878). Found also by A. R. Wallace on the same island.

This species and *P. nigripennis* are very distinct from any others of the genus known to me, and are remarkable by their very thick, and short middle tarsi, the front claw of which bears an enormous tooth; the middle tibiae are short and thick, but a good deal narrower at the extremity; the ligular portion of the labium is larger than in the other species.

Thornhill, August 1881.

NOTE XXXVII.

ON LEPIDIOTA GRACILIPES, SHARP.

BY

D. S H A R P.

In describing this insect (*Col. Hefte XV. p. 78*) I pointed out that it should probably form a distinct genus, and I said that »the prosternal process approaches that of *Lepidiota*." This latter statement requires some explanation, for on examination it appears that this insect has no prosternal process while in *Lepidiota* there is a well developed process. In *Lachnosterna* there is said to be no prosternal process, and therefore it would appear that the *L. gracilipes* might be placed in that genus. In *Lachnosterna* however, the hind portion of the prosternum stretches out, or grows out, more or less slightly backwards towards the mesosternum, and when there is a prosternal process, (which is the case in several Eastern species of the genus) it takes the form of a slender dependent free projection placed at some distance behind the front coxae. In the ordinary Lepidiotae the prosternum is very short behind the coxae, and the prosternal process grows out in close contact with this part of the legs. In *Lepidiota gracilipes* the prosternum is very short behind the coxae, and assumes in the middle a slightly protuberant form quite close to the coxae; on account therefore of this, the rudimentary prominence may be said to approach that of *Lepidiota*. The insect however will no doubt form a

distinct genus, to which the *Ancylonycha squamipennis* Burm. will probably belong, for Burmeister's description (*Handbuch* IV, 2, p. 315) seems to shew that it is closely allied to *Lepidiota gracilipes*.

A specimen of this species, captured at Grabak (Sumatra) in May 1877, has been brought home by the Sumatra-Expedition.

Thornhill, August 1881.

NOTE XXXVIII.

CARCINOLOGICAL STUDIES IN THE
LEYDEN MUSEUM.

BY

Dr. J. G. DE MAN.N^o. 2.*Ocypode ceratophthalma*, Pallas.

Ocypode ceratophthalma, Milne Edwards, Annal. Scienc. Nat. 1852, p. 141. Hilgendorf, in: Baron von der Decken's Reisen in Ost-Afrika, p. 82.

The Leyden collection contains: 1^o. eleven specimens, collected on the shores of Nossy-Faly near Madagascar, 2^o. three from the island of Xulla-Bessy (Moluccas), 3^o. one from Amboina, 4^o. eight (5 ♂, 3 ♀) from Amoy (China), presented by Mr. G. Schlegel, 5^o. one from the Philippines, collected by Semper and presented by the Göttingen Museum under the name of *Ocyp. longecornuta* Dana. — All these specimens, though positively belonging to the same species, present however some remarkable varieties.

The terminal spines of the eyes are very long and strong in the adult males, becoming gradually smaller in younger specimens (*Ocyp. urvillei Guérin*) and being only tuberculiform even in the adult females; their relative thickness however presents individual varieties, these spines being slender and tapering in the Nossy-Faly and Amboina specimens, but thicker in the Amoy individuals, and in the large adult male specimen of the Philippines they are a little shorter but rather thicker than in the Amoy forms,

the crabs agreeing for the rest wholly with one another. There are patches of thick hair on the under surface of the penultimate joints of the *second* and *third* legs and the muscular ridge on the inner surface of the larger hand of the male consists of numerous small secondary transverse ridges, that are more crowded on the under half of the ridge but separated by larger intervals on the upper half and change even gradually into small tubercles at the upper end.

This species however presents many most remarkable (perhaps local) varieties as regards the general physiognomy of the upper surface of the carapace, caused by a different course of the lateral margin of it, varieties that seem to have been regarded by Milne Edwards and others as different species. In all specimens however the external orbital angles, directed transversely outward, do not project beyond the bottom (»fond" Milne Edw.) of the external portion of the very oblique supraorbital margin and are situated very much behind the bottom of its internal portion. But the epibranchial angle, that lies there where the lateral margin is crossed by the oblique granular line on the lateral surfaces of the cephalothorax, projects more or less outward than the external orbital angle. So in the Nossy-Faly and also in the Xulla-Bessy specimens the external orbital angle projects more outward than the epibranchial, the lateral margin being therefore nearly straight and directed obliquely backwards, but in the adult Amoy specimens and in that of the Philippines the epibranchial angle projects more than the external orbital, the lateral margin being consequently more arcuated, the whole upper surface of the carapace appearing to be broader than that of the Nossy-Faly specimens. To this variety with relatively broader carapace perhaps belong the *Ocyp. platytarsis* Lam. and *Ocyp. brevicornis* M. Edw. But the specimen of Amboina and even a young from Amoy present a remarkable transition, the external orbital and the epibranchial angles equally projecting outward.

For the rest, as regards the shape of the hands, of the musical ridge, of the abdomen, of the legs, these varieties wholly resemble one another.

Ocyrode aegyptiaca Gerst.

Ocyrode aegyptiaca, Gerstaecker, Archiv. f. Naturg. XXII, pag. 134.

The Museum contains nine fine specimens collected at Djeddah by Mr. Kruyt (8 ♂, 1 ♀) and two others also from the Red Sea, presented by Mr. Kossmann under the name of the preceding species. These two species are however quite different ones. *Ocyro. aegyptiaca* constantly and really differs from the *ceratophthalma* Pallas, 1^o by a quite other shape of the cephalothorax, 2^o. by the patch of thick hair occurring only on the penultimate joints of the *second* legs, 3^o. by the long musical ridge of the male, the transverse secondary lines being *equally* and very much crowded over the whole length and very delicate.

The terminal spines of the eyes are very slender and tapering, and long both in the adult male and adult female, becoming tuberculiform and even quite disappearing in the young. The upper surface of the carapace is very convex in a longitudinal sense, everywhere granulated, more coarsely on the lateral regions, the front being large, truncated and granulated, the supra-orbital margin minutely denticulate. — The external orbital angle is rather obtuse, that part of the lateral margin which lies between the external orbital and epibranchial angles being convex, projecting more outward than the first called angle, and minutely denticulate; the posterior part of the margin, like the ridge that occurs on the lateral surface of the carapace are granular. The large hand is a little higher than in the preceding species, the under margin being more convex and coarsely denticulate, the upper margin more acute than in *ceratophthalma*. The dactylopodites are rather broader than in the preceding species.

In young specimens the external orbital angle is a right one, and the musical ridge is quite developed.

Ocypode cursor Belon.

Ocypode cursor Belon, Milne Edwards, Annal. Scienc. Nat. 1852, p. 142.

In this species, two adult male and several young specimens of which from the Congo coast were presented by Mr. P. Kamerman, Officer of the Dutch commercial company on the Congo coast, the musical ridge, tapering at both its ends, consists of many transverse delicate lines, like in *Ocyp. aegyptiaca*, that are equally crowded over its whole length. We received also a fine male from Acra d'Elmina.

Ocypode arenaria Catesby.

Confer: S. I. Smith, Crustacea on the Coast of new England in: Transactions Connecticut Academy, Vol. IV, July 1880, p. 254.

We received a fine male specimen from the shores of the island of Curaçao. The musical ridge consists of a series of very small round *tubercles*; the external orbital angle projects even beyond the rounded prominence on the supraorbital margin. This species may be distinguished at first sight by the long hairs, with which the ambulatory legs are clothed.

Ocypode cordimana Latr.

Ocypode cordimana Latreille, Milne Edwards, Alph. Milne Edwards, Nouv. Arch. du Musée, T. IX, pag. 271, Hilgendorf, l. c pag. 82. Nee *Ocyp. cordimana* de Haan, Fauna Jap. Crust. p. 57, Tab. XV, fig. 4.

The Museum contains 33 specimens, collected at Amoy

by Mr. G. Schlegel ¹⁾, one adult female specimen from the island of Xulla-Bessy, four specimens (2 ♂, 2 ♀) from the shores of Shanghir and one fine male individual, collected at Bezoeki (Java) by Mr. Semmelink. All these specimens wholly agree with one another.

This common Indian species may be distinguished from all other species of *Ocypode*, 1°. by the eyes being devoid of terminal spines even in the adult, 2°. by the inner surface of the larger hand having no trace of a musical ridge both in the male and in the female and 3°. by the shape of the cephalothorax and of the legs. The description of this long known form being still ever insufficient, it will be allowed to give another one.

The cephalothorax is very high and thick; its upper surface extremely convex longitudinally, everywhere granulated, the granules being somewhat coarser on the lateral portions and on the front. Front with a minute triangular median incision on its anterior margin. Supraorbital margin transverse with a rounded prominence on each side of the front, with the acute external orbital angles directed forward, projecting beyond the described prominence and beyond the base of the front. The epibranchial angle projects beyond the external orbital and that part of the granulated lateral margin, that lies between these two angles, is convex; behind the epibranchial angle the lateral margin is rather a little concave and does not proceed till the posterior margin of the carapace but ceases at some distance from it. The minutely denticulated suborbital margin is separated by a deep incision from the external orbital angle, and the internal suborbital tooth is acute and granulated. Pterygostomian regions convex and granulated. Internal inferior margin of the arms provided with a denticulated crest. The sternum is less granular than that of *Ocyp. ceratophthalma* and the various joints of

1) These Amoy specimens were labelled by Mr. Herklots as *Ocypode grossimana* Herklots; happily, as far as I am aware, this name never has been published, for they belong all to the common *Ocyp. cordimana* Latr.

the male abdomen are comparatively broader, less elongate than in that species. The external shape of the hands very much agrees with that of the hands of *Oryp. ceratophthalma* Pallas, but the tubercles on the upper margin of the larger hand and on the upper margin of the mobile finger are less spiniform, more depressed. The penultimate joints of the second and third ambulatory legs are provided with a patch of hairs on the under surface and the dactylopodites are rather broad and clothed with hairs on the margins.

As regards the geographical range of our species, it occurs positively on the shores of Zanzibar, Java, Xullabessy, Sanghir, New-Caledonia and Amoy, so that it is found in the whole Indian Ocean and Malayan Archipelago. —

The *Oryp. cordimana* of de Haan was founded upon a young specimen of *Oryp. ceratophthalma* Pallas, as I can positively affirm: young specimens of the latter species, collected at Amoy, having the carapace 19 millim. broad, not only wholly agree with the description and the figures of de Haan's *cordimana*, but even with the typical specimens of the author of the *Fauna Japonica*, found back by me in the Leyden Museum.

Oryp. convexa Stimpson (Proc. Philad. 1858, p. 100) from Japan, will be allied to our species, when not identical, for its insufficient description is nearly wholly applicable to the *Oryp. cordimana* Latr.

The description of *Oryp. cordimana* Latr. in Milne Edwards, Hist. Nat. des Crustac. pag. 45 without any doubt is wrong, and it will be difficult to explain this fault; Alph. Milne Edwards however has rectified the description of this species, when describing his specimens from New Caledonia.

Ocypode kuhlii de Haan.

Ocypode kuhlii de Haan, Fauna Japonica, Crustacea, p. 58.

I only found two specimens of this beautiful, apparently rare species, a nearly adult male, collected by Kuhl and van Hasselt on the shores of the island of Java, and another fine adult male, also from the Indian Archipelago, the former specimen being the type of de Haan's short description.

In its outward appearance, the cephalothorax very well resembles that of *Ocyp. arenaria* Catesby from the West-Indies, being broader than long, the breadth of the upper surface being in proportion to the length as 4 : 3. Like in *Ocyp. arenaria* Catesby and in *Ocyp. cordimana* Latr., the acute external orbital angles project beyond the rounded prominence of the supraorbital margin, but are directed *outward* and not inward as takes place in the two quoted species. The epibranchial angle projects more outward than the orbital angle and the granulated lateral margins are therefore convexly arcuated, though being rather concave immediately behind the triangular external orbital angles. The front is much deflexed and arcuated anteriorly, with a minute median triangular incision at its anterior margin. The upper surface of the carapace is much convex longitudinally and granulated, more coarsely on the lateral portions than in the middle. Suborbital margin minutely denticulated, internal suborbital tooth denticulate. Convex pterygostomian regions coarsely granulated. External surface of the external maxillipedes a little granulated. Peduncles of the eyes *without* any trace of terminal prolongation. External surface of the sternum and of the male abdomen minutely granulated, the first segment of the sternum (between the anterior legs) armed with two granulated ridges on each side. Anterior legs very unequal in size; arms as in *Ocyp. cordimana* Latr., upper margin rounded and transversely rugose, internal and external margins of the smooth under surface armed with dentiform tubercles. External rounded margin of the carpopodite granular, internal angle denticulate. Hands *much compressed and more elongate* than in *Ocyp. cordimana* Latr., the upper margin

of the palm of the large hand being rather longer than the height of the rather little convex external surface; upper margin of the palm rounded and coarsely granulated, like also the upper margin of the compressed mobile finger, immobile finger much compressed, a little longer than the upper, with concave under margin that passes into the somewhat convex denticulate under margin of the palm. Internal surface granular inferiorly and provided with a musical ridge, composed out of some few (8 or 10) small ovoid tubercles arranged longitudinally. Smaller hand much compressed and elongate, external surface granular, under margin denticulate. Upper margins of the meropodites of the ambulatory legs transversely rugose, under margins granulated; the following joints with two granular ridges on the external surface, penultimate joints transversely rugose on the outer and inner surfaces, *without* patches of hairs on those of the second and third legs (as are found in *Ocyp. cordimana* Latr.); dactylopodites rather broad, more enlarged than those of *Ocyp. cordimana* Latr., with the external surface pubescent and having both margins provided with some hairs near the base.

Measureings of the adult specimen:

Distance between the external orbital angles 38 mm.

Distance between the epibranchial angles 43 mm.

Length of the carapace 33 mm.

Length of the upper margin of the palm of the larger hand 22 mm.

Length of the whole larger hand 45 mm.

Height of the larger hand near the articulation of the mobile finger 21 mm.

This species may be distinguished from *Ocyp. cordimana* Latr., (both having the eyes without terminal prolongation), by the different shape of the carapace, the elongate chelipedes, the existence and the structure of the musical ridge, the under surface of the penultimate joints of the second and third legs being devoid of hairs, etc.

The quoted insufficient and ambiguous description of

Ocyp. convexa Stimpson, is also somewhat applicable to this species, and perhaps also *Ocyp. laevis* Dana may be allied to our form, (the description of the latter is not in my hands) or even identical, but in all cases the name of *kuhlii* must have the priority.

Ocypode africana n. sp.

A single fine male specimen of this inhabitant of the shores of tropical West-Africa from Liberia to the Congo was presented by Mr. P. Kamerman, who made already several very interesting collections for our Museum. This species was already known to Mr. Hilgendorf (l. c. pag. 81), whose specimen was from Liberia, but he did not describe it; our individual was found on the shores of the Congo coast.

In its outward appearance this species extremely resembles the Indian *Ocyp. cordimana* Latr., from which it is however at first sight distinguished by the occurrence of a musical ridge on the inner surface of the larger hand, and our species must be regarded as the representative of that Indian species in the seas of West-Africa.

Upper surface of the cephalothorax very convex longitudinally, everywhere covered with minute depressed granulations; front very much deflexed, granular; external orbital angles extending as far as the rounded prominence of the supraorbital margin, directed inward, though not so much as in *Ocyp. cordimana*, at least in the specimen before me; that part of the minutely granulated lateral margin, that lies between the epibranchial and orbital angles a little convex, the posterior part directed obliquely afterwards; epibranchial angle projecting a little more outward than the orbital angle, and situated more forward than in *Ocyp. cordimana*, that portion of the lateral margin which lies between the epibranchial and orbital angles being relatively shorter in proportion to the whole lateral margin than in the Indian representative of our species. Eyepeduncles

without any terminal prolongation. Lateral surfaces of the cephalothorax smooth, pterygostomian regions convex and coarsely granulated; suborbital margin granulated, with a small incision near the middle, covered with some hairs and making a nearly straight angle with the external orbital angle. External surface of the outer foot-jaws a little granulated and hairy. Sternum punctate, first segment (between the chelipedes) a little granular. Male abdomen much narrower than that of *Ocyp. cordimana*, terminal segment triangular as long as broad, second segment rather somewhat longer than broad at the base, with the lateral margins much *arcuated* outward, and therefore having a very characteristic shape, both segments minutely punctate; third segment quadrangular, punctate, rather longer than broad, with the lateral margins nearly straight; fourth segment quadrangular, more than twice as broad as long, a little granular, like also the three remaining basal segments, that have nearly the same shape as in *Ocyp. cordimana*.

Chelipedes very unequal in size, almost wholly agreeing as regards their shape and structure with those of *Ocyp. cordimana* Latr. Musical ridge extending from near the granulated inferior margin till near the upper angle of the articulation of the mobile finger, composed out of delicate transverse lines that become gradually narrower towards the upper part of the ridge, but do not change into tubercules. Internal surface of the large hand granulated; under surface of the trochanters of both chelipedes armed with a linear tubercle striated longitudinally, that serves as a fiddlestick for the musical ridge, that of the larger trochanter being longer than the other. Upper margins of the meropodites of the ambulatory legs transversely rugose. Under surface of the penultimate joints of the second and third legs without patches of hairs, distal part of the external margin of the under surface of the penultimate joints of the third legs hairy; some few hairs on the under margins of the meropodites. Dactylopodites more slender than

those of *cordimana* Latr., hairy on both margins, the ambulatory legs having for the rest the same shape and structure as those of that Indian species.

Measurements of our specimen:

Distance between the external orbital angles $27\frac{1}{2}$ mm.

Distance between the epibranchial angles 29 mm.

Length of the carapace $22\frac{1}{2}$ mm.

Length of the larger hand 21 mm.

Height of the larger hand 12 mm.

Macrophthalmus depressus Rupp.

Macrophthalmus depressus, Ruppell, Krabben, p. 19, Taf. IV, fig. 6.

Milne Edwards, Ann. Scienc. Nat. 1852, p. 159.

Four specimens were collected at Djeddah. This species is most closely allied to *Macrophth. japonicus* de Haan, but may be distinguished by the following: our specimens at least are of a smaller size than that of *Macrophth. japonicus*, the breadth of the carapace being 21 mm., that of the Japanese form 32 mm., but the shape and structure of the cephalothorax are nearly quite the same in both species. The external surface of the hands of the male is a little more convex, its inferior margin being less arcuated and being rounded, while in *Macrophth. japonicus* it is much arcuated, rather acute and granular. The convex internal surface in the Japanese form is a little granular near the articulation, but closely covered with many hairs in *depressus*; the upper margin of the mobile finger granular in *japonicus*, but rather smooth in the other, and the tooth with which its inner margin is armed, is broader in the Red Sea form. Finally the under surface of the meropodites of the three middle legs and the internal surface of the tibiae and tarsi of the fourth pair are closely covered with hairs in *depressus*, but nearly smooth in the other.

Leucosia urania Herbst.

Eight specimens were collected at Djeddah, Red Sea. They agree wholly with the typical specimen of *Leuc. neo-caledonica* Alph. M. Edw. from New-Caledonia, that I described for some time to be identical with *Leuc. urania* Herbst (Notes Leyden Museum, Vol. III, p. 123). The upper margin of the palm of the hands in our specimens is cristate, it being more rounded in the New-Caledonian specimen, but it may be attributed to the larger size of that individual. There are two dark spots on the posterior surface of the carapace.

Leyden, Sept. 1881.

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1) Correction: p. 161 line 3 (from top of diagnosis), for „albo-spinosis“ read „albo-annulatis.“

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