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NOVEMBER 18.

Price 8s.

THE JOURNAL

OF

THE LINNEAN SOCIETY.

VOL. XXII.

ZOOLOGY.

No. 186.

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THE JOURNAL
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THE LINNEAN SOCIETY.

Report on the Podophthalmous Crustacea of the Mergui Archipelago, collected for the Trustees of the Indian Museum, Calcutta, by Dr. John Anderson, F.R.S., Superintendent of the Museum. By Dr. J. G. DE MAN, of Middleburg, Netherlands. (Communicated by Dr. JOHN ANDERSON, F.R.S., F.L.S.)

[Read 17th June, 1886.]

(PLATES I.-XIX.)

THE Crustacea described in the following pages are mostly littoral species. The Collection contains no fewer than 166 species, 38 of which are new to science, *i.e.* nearly a fourth of the whole number. They are represented by about 1060 specimens, in an excellent state of preservation. 118 species are new to the Fauna of the Bay of Bengal (including Ceylon, the Nicobar Islands, and Singapore), only 48 species in the Collection having been previously recorded from that part of the Indian Ocean. These numbers are highly surprising, as the Bay of Bengal has been explored, years ago, by many naturalists. Large carcinological collections were made in former times by French naturalists on the coast of Coromandel and at Ceylon, and a still larger number of species were collected, in the years 1857-59, by the famous 'Novara' Expedition, at the same localities and especially at the Nicobar Islands. In the Report published in 1865, by Prof. Heller on the Decapoda and Stomatopoda collected during that expedition, no less than

109 species were enumerated from Madras, Ceylon, and the Nicobar Islands, a fifth of which were new to science. Scarcely more than a fourth of these 109 species occur in the Mergui Collection. The Decapodous and Stomatopodous Crustacea in this interesting Mergui Collection that are new to the Fauna of the Bay of Bengal prove to be about two thirds of the number of species hitherto known as inhabiting it! The species therefore of these two groups now ascertained to occur in the Bay amount to nearly 300.

These numbers are eloquent and demonstrate that the collection made by Prof. Anderson is a most interesting one, and a valuable contribution to the Fauna of the north-eastern part of the Indian Ocean.

The following table gives a summary of the number of species, of the new species, and of the specimens in the Collection, according to the subdivisions of the group:—

	Number of Species.	New Species.	Specimens.
Oxyrhyncha	9	3	21
Cyclometopa	48	5	205
Catometopa	47	17	540
Oxystomata	11	1	26
Anomura	26	5	144
Macrura	19	6	103
Stomatopoda	4	1	19
Pœcilopoda.....	2	...	3
	<hr/> 166	<hr/> 38	<hr/> 1061

These results show that the subtribe *Catometopa* contains comparatively the largest number of new species, and that more than a half of all the specimens belong to it.

The genera of *Catometopa* include many groups that are at present very insufficiently and unsatisfactorily known: I have only to refer to the genera *Telphusa*, *Ocyppoda*, *Sesarma*, and *Gelasimus* as instances of the great confusion that still prevails regarding these common Indian forms. Only five years ago I first pointed out the distinctive characters of the common and widely distributed *Ocyppoda cordimana*—a species at that time so unsatisfactorily known that it was almost impossible to distinguish it from allied forms, although it had been described more than half a century before!

This fact leads me to direct attention to the confusion that still exists regarding the synonymy of many common Indian Podophthalmous Crustacea. This circumstance may be accounted for by the fact that such authors as Milne-Edwards, de Haan, and Dana, when describing species of former carcinologists, *e. g.* of Fabricius and Herbst, had neither studied nor examined their typical specimens, preserved in the Museums of Kiel, Copenhagen, and Berlin; although the diagnoses of Fabricius and the descriptions and figures of Herbst were often too short or insufficient to enable the species to be satisfactorily recognized. A renewed examination of the typical specimens of these older carcinologists, so far as they are still available, appears to me to be most desirable.

I have made a beginning in this direction by examining the types of certain species described by Fabricius, Milne-Edwards, and some others, so far as this was necessary for the present Report; and I am now occupied with a critical study of the Australian species which were described about twenty years ago by Mr. Hesse. I have given in the present Report some results of these studies, which I think will prove to be of value and contribute to a more exact knowledge of the common Indian Decapoda. I have also pointed out the distinctive characters of *Menippe Rumphii*, Fabr., and of *Myomenippe granulosa*, A. M.-Edw., both common species of large size, but which nevertheless were insufficiently known. I have furthermore given new and full descriptions of four common species of *Gelasimus*, and have elucidated the characters of the little-known group of *Metaplax* and those also of many species of the genus *Sesarma*, which are so extremely difficult to distinguish that great confusion regarding them is still observable in carcinological works.

The Collection made by Prof. Anderson contains, as already observed, a large number of interesting forms. I would especially call attention to the following species:—a new form of the rare Maioid genus *Harrovia*, two rare species of *Leptodius* (*L. nudipes* and *L. cavipes*), two species of *Heteropanope*; a large series of *Goniosoma merguense* and of *Gelasimus*; two new forms of the singular genus *Dotilla*; the new genus *Dioxippe*; the rare and interesting forms of *Metaplax*; eight species of *Porcellana*; and, finally, the interesting species of *Macrura*.

Some common Indian genera, on the contrary, are not at all

represented in the collection, *e. g.*, *Matuta*, *Palinurus*, and the *Hippide*.

Most species are represented by a small number of specimens. A few, however, are an exception and appear to have been very common at the Mergui Islands at the time the collection was made, as indicated in the following table:—

	Specimens.		Specimens.
<i>Leptodius exaratus</i> , M.-Edw....	25	<i>Gelasimustriangularis</i> , A.M.-Ed.	33
<i>Goniosoma merguicnse</i> , n. sp....	20	<i>Dotilla intermedia</i> , n. sp.....	32
<i>Gelasimus Dussumieri</i> , M.-Edw.	57	<i>Metaplar elegans</i> , n. sp.	29
— <i>acutus</i> , Stimps.	67	<i>Sesarma Edwardsi</i> , n. sp.	66
— <i>annulipes</i> , Latr.	33	<i>Porcellana picta</i> , Stimps.....	25

The genus *Porcellana* is represented in the Bay of Bengal by no fewer than 15 species, 8 of which are in the collection.

Finally, I desire to take this opportunity of expressing my obligation to the following gentlemen, from whom I have received valuable assistance. I am especially indebted to Dr. F. A. Jentink, Director, and to Dr. R. Horst, Conservator, of the Zoological Museum of Leyden, for having permitted me to study a large series of interesting typical specimens preserved in that great Institution. My thanks are due to Mr. C. Ritzema, Conservator of the same Museum, for having kindly granted me the loan of many valuable carcinological works during the time I was working at this Collection; and also to Prof. Alph. Milne-Edwards, of Paris, to Prof. Möbius, of Kiel, and to Mr. C. Koelbel, of Vienna, for having permitted me to study a large number of typical specimens, described respectively by the late H. Milne-Edwards, by Fabricius, and in the 'Novara' Expedition. I have to express my thanks also to Dr. F. Meinert, of Copenhagen, for having graciously presented to me excellent life-size photographs of three species of Fabricius, the types of which are preserved in the Museum of Copenhagen; and to Dr. Hilgendorf, of Berlin, and to Dr. F. Richters, of Frankfort-on-the-Main, for having kindly compared for me specimens from Mergui with typical specimens of Herbst and Rüppell.

A. List of Species collected in the Mergui Archipelago.

DECAPODA.

BRACHYURA.

- **Doclea hybrida*, *Fabr.*
 ——— *Andersoni*, n. sp.
 ——— sp.
Hyastenus Hilgendorfi, n. sp.
 ——— *Pleione*, *Herbst.*
Naxia (*Naxioides*) *Petersii*, *Hilgendorfi*.
 **Schizophrys aspera*, *H. M.-Edw.*
Micippa Haanii, *Stimps.*
 **Lambrus longimanus*, *H. M.-Edw.*
Harrowia elegans, n. sp.
- **Atergatis integerrimus*, *Lam.*
 * ——— *floridus*, *Rumph.*
Carpilodes Stimpsoni, *A. M.-Edw.*
Actæa areolata, *Dana.*
 * ——— *rufopunctata*, *H. M.-Edw.*
 ——— *parvula*, *de Haan.*
 ——— sp.
Euxanthus mamillatus, *H. M.-Edw.*
Xantho impressus, *Lam.*
Medæus distinguendus, *de Haan.*
 **Chlorodius niger*, *Forsk.*
 ——— *sculptus*, *A. M.-Edw.*
Leptodius exaratus, *H. M.-Edw.*
 ——— *nudipes*, *Dana.*
 ——— *cavipes*, *Dana.*
 ——— sp.
 **Chlorodopsis pilumnoides*, *Ad. & White.*
Cymo Andreossyi, *Aud.*
 **Menippe Ramphii*, *Fabr.*
Myomenippe granulosa, *A. M.-Edw.*
Euryarcinus maculatus, *A. M.-Edw.*
 **Ozium tuberculatus*, *H. M.-Edw.*
 **Epixanthus frontalis*, *H. M.-Edw.*
 ——— *dentatus*, *White.*
Actumnus setifer, *de Haan.*
 ——— *elegans*, n. sp.
 * ——— *nudus*, *A. M.-Edw.*
Heteropanope indica, n. sp.
 ——— *eucratoides*, *Stimps.*
Pilumnus vespertilio, *Fabr.*
 ——— *Andersoni*, n. sp.
 ——— *seminudus*, *Miers.*
 ——— *lævis*, *Dana.*
 **Eriphia levis*, *Latr.*
 **Trapezia cymodoce*, *Herbst.*
 **Neptunus pelagicus*, *L.*
 ? ——— *gladiator*, *Fabr.*
 ——— *Andersoni*, n. sp.
Thalamita Savignyi, *A. M.-Edw.*
 ——— *integra*, *Dana.*
- **Thalamita sima*, *H. M.-Edw.*
 ——— *prymna*, *Herbst.*
 ——— *spinimana*, *Dana.*
 ——— *Dana*, *Stimps.*
 * ——— *crenata*, *Latr.*
 **Goniosoma cruciferum*, *Fabr.*
 * ——— *affine*, *Dana.*
 ——— *merguiense*, n. sp.
- Eucrate affinis*, *Hasw.*
Carcinoplax setosus, *A. M.-Edw.*
 ——— *integer*, *Miers.*
 **Telphusa Stoliczkana*, *Wood-Mason.*
 ——— *Callianira*, n. sp.
 ——— *carinifera*, n. sp.
Pimnotheres Edwardsi, n. sp.
 ——— *parvulus*, *Stimps.*
Xanthasia murigera, *White.*
 ——— sp.
- **Ocypoda ceratophthalma*, *Pall.*
 * ——— *cordimana*, *Latr.*
Gelasimus Dussumieri, *H. M.-Edw.*
 ——— *acutus*, *Stimps.*
 * ——— *annulipes*, *Latr.*
 * ——— *triangularis*, *A. M.-Edw.*
Macrophthalmus tomentosus, *Eyd. & Soul.*
 ——— *depressus*, *Rüpp.*
 ——— *Erato*, n. sp.
Dotilla brevitarsis, n. sp.
 ——— *intermedia*, n. sp.
Dioxippe orientalis, n. gen. et n. sp.
 **Metopograpsus messor*, *Forsk.*
 ——— *maculatus*, *H. M.-Edw.*
 **Grapsus strigosus*, *Herbst.*
Pachygrapsus minutus, *A. M.-Edw.*
Pyxidognathus Deianira, n. sp.
Metaplax crenulatus, *Gerst.*
 ——— *distinctus*, *H. M.-Edw.*
 * ——— *dentipes*, *Heller.*
 ——— *elegans*, n. sp.
 ——— *intermedius*, n. sp.
Sesarma Aubryi, *A. M.-Edw.*
 * ——— *aspera*, *Heller.*
 ——— *Melissa*, n. sp.
 ——— *pieta*, *de Haan.*
 ——— *Andersoni*, n. sp.
 ——— *Haswelli*, n. sp.
 ——— *Dussumieri*, *H. M.-Edw.*
 ? ——— *livida*, *A. M.-Edw.*
 ——— *tæniolata*, *White.*
 ——— *intermedia*, *de Haan.*

Sesarma Edwardsi, n. sp.	Leucosia urania, <i>Herbst.</i>
—, var. crassimana, n.	? Pseudophilyra Hoedtii, <i>de M.</i>
— polita, n. sp.	— Melita, n. sp.
— Kraussi, n. sp.	*Philyra scabriuscula, <i>Fabr.</i>
— sp.	— platycheira, <i>de Haan.</i>
Clistoccloma merguensis, n. sp.	— globosa, <i>Fabr.</i>
*Calappa philargius, <i>L.</i>	Myra punctata, <i>Herbst.</i>
*— gallus, <i>Herbst.</i>	*Dorippe quadridens, <i>Fabr.</i>
	— sp.

ANOMURA.

Dromidia unidentata, <i>Rüpp.</i> , var.	Diogenes merguensis, n. sp.
— cranioides, n. sp.	*— miles, <i>Fabr.</i>
Cryptodromia, sp.	*— avarus, <i>Heller.</i>
*Porcellana inermis, <i>Heller.</i>	— sp.
— japonica, <i>de Haan.</i>	*Clibanarius infraspinatus, <i>Hilgend.</i>
*— dentata, <i>H. M.-Edw.</i>	— padavensis, n. sp.
— Boscii, <i>Aud.</i>	— virescens, <i>Krauss.</i>
— sculpta, <i>H. M.-Edw.</i>	— æquabilis, <i>Dana</i> , var. merguensis, n.
— corallieola, <i>Haw.</i>	— Arethusa, n. sp.
— picta, <i>Stimps.</i>	— sp.
— Euphrosyne, n. sp.	— sp.
*Pagurus punctulatus, <i>Oliv.</i>	*Cenobita violascens, <i>Heller.</i>
— deformis, <i>H. M.-Edw.</i>	
Calcinus terra-regina, <i>Haw.</i>	

MACRURA.

Gebia carinicauda, <i>Stimps.</i>	Nica macrognatha, <i>Stimps.</i>
Gebiopsis intermedia, n. sp.	Harpilius Miersi, n. sp.
*Thalassinia anomala, <i>Herbst.</i>	Hippolyte oligodon, n. sp.
*Themis orientalis, <i>Fabr.</i>	*Palæmon carcinus, <i>Fabr.</i>
Alpheus brevisirostris, <i>Oliv.</i>	— acutirostris, <i>Dana.</i>
— rapax (<i>Fabr.</i>), <i>de Haan.</i>	*— equidens, <i>Dana.</i>
*— Edwardsii, <i>Aud.</i>	*Penæus semisulcatus, <i>de Haan.</i>
— Hippothoë, n. sp.	— sculptilis, <i>Heller.</i>
*— minor, <i>Say</i> , var. neptunus.	— merguensis, n. sp.
— —, var. biunguiculatus.	— Lysianassa, n. sp.

STOMATOPODA.

*Squilla nepa, <i>Latr.</i>	Pseudosquilla pilaensis, n. sp.
— raphidea, <i>Fabr.</i>	*Gonodaetylus chiragra, <i>Fabr.</i>

PÆCILOPODA.

Limulus moluccanus, <i>Latr.</i>	Limulus rotundicauda, <i>Latr.</i>
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[N.B.—In the foregoing list those species which have been previously observed in other parts of the Bay of Bengal (on the coast of Coromandel, at Ceylon, at the Nicobar Islands) and at Singapore are marked with an asterisk.]

B. *List of Species recorded from the Bay of Bengal* (coast of Coromandel, Ceylon, Nicobar Islands) *and Singapore*, which are not represented in the Mergui Collection.

The species in the following list which are *not* marked with an asterisk were collected during the years 1857-59 by the 'Novara' Expedition, and have been described by Dr. Heller; those which are marked with an asterisk have been recorded by M.M. H. and A. Milne-Edwards and others.

- | | |
|----------------------------------------------------------------------|-----------------------------------------------|
| * <i>Egeria arachnoides</i> , Latr. | * <i>Macrophthalmus carinimanus</i> , Latr. |
| * <i>Chorinus aries</i> , Latr. | * ——— <i>lavimanus</i> , H. M.-Edw. |
| <i>Micippa hirtipes</i> , Dana. | ——— <i>bicarinatus</i> , Heller. |
| <i>Tiarinia verrucosa</i> , Heller. | <i>Gelasimus vocans</i> , Rumph. |
| <i>Acanthonyx consobrinus</i> , A. M.-Edw. | ——— <i>tetragonon</i> , Herbst. |
| * <i>Lambrus echinatus</i> , H. M.-Edw. | ——— <i>rubripes</i> , Luc. & Jacq. |
| * ——— <i>delexitrons</i> , Miers. | <i>Ocypoda platytarsis</i> , H. M.-Edw. |
| * ——— <i>Holdsworthii</i> , Miers. | ——— <i>macrocera</i> , H. M.-Edw. |
| * ——— <i>hoplonotus</i> , Ad. & White. | <i>Metopograpsus oceanicus</i> , Luc. & Jacq. |
| ———, var. <i>planifrons</i> , Miers. | * <i>Grapsus maculatus</i> , Catesby. |
| * ——— <i>carenotus</i> , H. M.-Edw. | ——— <i>rudis</i> , H. M.-Edw. |
| <i>Xantho Lamarekii</i> , H. M.-Edw. | * <i>Geograpsus Grayi</i> , H. M.-Edw. |
| ——— <i>notatus</i> , Dana. | * <i>Plagusia tuberculata</i> , Lam. |
| ——— <i>granosomanus</i> , Dana. | * ——— <i>immaculata</i> , Lam. |
| * <i>Carpilodes rugatus</i> , H. M.-Edw. | <i>Acanthopus planissimus</i> , Herbst. |
| <i>Etusius utilis</i> , Homb. & Jacq. | <i>Varuna litterata</i> , Fabr. |
| * ——— <i>lavimanus</i> , Rond. | <i>Pseudograpsus barbatus</i> , Rumph. |
| <i>Actæodes tomentosus</i> , H. M.-Edw. | <i>Cyclograpsus punctatus</i> , H. M.-Edw. |
| ——— <i>nodipes</i> , Heller. | <i>Nectograpsus politus</i> , Heller. |
| <i>Leptodius sanguineus</i> , H. M.-Edw. | <i>Grapsodes notatus</i> , Heller. |
| <i>Pilodius pugil</i> , Dana. | <i>Ptychognathus pusillus</i> , Heller. |
| <i>Ozius rugulosus</i> , Stimps. | <i>Sesarina Eydouxi</i> , H. M.-Edw. |
| <i>Trapezia cærulea</i> , Rüpp. | ——— <i>bidenis</i> , de Haan †. |
| ——— <i>areolata</i> , Dana. | ——— <i>indica</i> , H. M.-Edw. |
| * ——— <i>ferruginea</i> , Latr. | ——— <i>gracilipes</i> , H. M.-Edw. |
| * ——— <i>rufopunctata</i> , Herbst. | <i>Calappa tuberculata</i> , Fabr. |
| <i>Neptunus sanguinolentus</i> , Herbst. | ——— <i>lophos</i> , Herbst. |
| * <i>Achelous granulatus</i> , H. M.-Edw. | <i>Matuta victrix</i> , Fabr. |
| <i>Scylla serrata</i> , Forsk. | * ——— <i>picta</i> , Hess. |
| <i>Thalamita Admete</i> , Herbst. | * ——— <i>lunaris</i> , Herbst. |
| ——— <i>cæruleipes</i> , Luc. & Jacq. | * <i>Leucosia craniolaris</i> , L. |
| <i>Goniosoma sexdentatum</i> , Herbst. | * ——— <i>brunnea</i> , Miers. |
| * ——— <i>nator</i> , Herbst. | * <i>Cryptocnemus Holdsworthii</i> , Miers. |
| ——— <i>annulatum</i> , Fabr. (= orientale, Heller, <i>nee</i> Dana). | <i>Albunea symnista</i> , Fabr. |
| * ——— <i>rostratum</i> , A. M.-Edw. | <i>Remipes testudinarius</i> , H. M.-Edw. |
| * <i>Lissocarcinus polybioides</i> , Ad. & White. | <i>Hippa asiatica</i> , H. M.-Edw. |
| * <i>Macrophthalmus transversus</i> , Latr. | <i>Porcellana pisum</i> , H. M.-Edw. |
| | ——— <i>pisoides</i> , Heller. |

† It is with much hesitation that I include this species in the list. Heller records it; but I have little doubt that his specimen belonged to *Sesarina Haswelli*, n. sp.

- | | |
|--------------------------------------|-------------------------------------------|
| Porcellana Danaë, <i>Heller.</i> | Alpheus charon, <i>Heller.</i> |
| — scabriuscula, <i>Dana.</i> | * — comatulorum, <i>Hasw.</i> |
| — militaris, <i>Heller.</i> | Anchistia notata, <i>Heller.</i> |
| — penicillata, <i>Heller.</i> | * Leander longirostris, <i>H. M.-Edw.</i> |
| — barbata, <i>Heller.</i> | — — distans, <i>Heller.</i> |
| Cornobita clypeata, <i>Herbst.</i> | Palæmon rudis, <i>Heller.</i> |
| — rugosa, <i>H. M.-Edw.</i> | — — scabriculus, <i>Heller.</i> |
| — Olivieri, <i>Owen.</i> | — — lanceifrons, <i>Dana.</i> |
| Calcinus tibicen, <i>Herbst.</i> | Hippolyte gibbosus, <i>H. M.-Edw.</i> |
| — Gaimardi, <i>H. M.-Edw.</i> | * Sicyonia ocellata, <i>Stimps.</i> |
| Clibanarius striolatus, <i>Dana.</i> | Petæus monoceros, <i>Fabr.</i> |
| — corallinus, <i>H. M.-Edw.</i> | — — indicus, <i>H. M.-Edw.</i> |
| — humilis, <i>Dana.</i> | — — monodon, <i>Fabr.</i> |
| — — longitarsis, <i>de Haan.</i> | — — avirostris, <i>Dana.</i> |
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| Palinurus dasypus, <i>H. M.-Edw.</i> | * Gonodactylus glyptocercus, <i>Wood-</i> |
| * Scyllarus rugosus, <i>Latr.</i> | <i>Mason.</i> |
| Alpheus lævis, <i>Rand.</i> | |

Order DECAPODA.

Tribe BRACHYURA.

Subtribe *Oxyrhyncha.*

Family INACHIDÆ.

Genus DOCLEA, *Leach.*

The genus *Doclea*, although known since the beginning of the century, belongs nevertheless to a group of Decapods which stands greatly in need of revision. Little doubt can be entertained that some species, formerly described by Bleeker † and by Stimpson, will ultimately prove to be identical when a large series of individuals of different sizes and ages are compared together. Mr. Miers ‡, the well-known and zealous English carcinologist, seems to hold the same opinion, for he has already united some species.

The Mergui Collection contains four specimens of *Doclea*, which belong to three different species, one of which is new.

† 'Recherches sur les Crustacés de l'Inde Archipélagique,' Batavia, 1856.

‡ *Annals & Mag. Nat. Hist.* 1880, ser. 5, vol. v, p. 226.

1. *DOCLEA HYBRIDA*, *Fabr.*

Inachus hybridus, *Fabricius, Supplementum Entomologiae systematicae*, Hafn. 1798, p. 355.

Doclea hybrida, *Milne-Edwards, Histoire Naturelle des Crustacés*, t. i. 1834, p. 294.

(Compared by me with the typical specimen of *Fabricius*, preserved in the Museum of the University of Kiel.)

One fine female specimen was collected at Sullivan Island.

The length of the cephalothorax* measures about 35 millim., while the breadth amounts to 34 millim., the lateral spines being excluded. The cephalothorax, which appears nearly circular, has an extremely convex and semiglobular upper surface, which bears many dentiform tubercles; the woolly down with which this species is covered is only observed in this specimen near the antero-lateral margins. The rostrum, which is a little broken off at the tip, is short, though not shorter than that of *Doclea ovis*, as figured in *Milne-Edwards's 'Règne Animal de Cuvier,'* plate 33; it is 6 millim. long from the tip to a transverse line which unites the two internal angles of the fissures that are found in the upper margins of the orbits, while this transverse line, which I regard as the base of the rostrum, is itself 9 millim. long. The antero-lateral margins are armed with four rather short though acute spines; the second spine is the smallest, the third is a little longer than the first, and the last spine is still somewhat longer and larger than the third, measuring $3\frac{1}{2}$ millim., directed transversely outward (not forward), and being exactly equidistant from the external orbital angle and the base of the spine with which the posterior margin of the carapace is armed. The latter spine is very short, measuring only 2 millim., so that it is as long as the third antero-lateral spine and directed horizontally backwards. The interregional grooves on the upper surface of the cephalothorax are rather strongly marked, so that the regions are very distinct. The upper surface of the cephalothorax is armed with many short, rather obtuse, dentiform tubercles, which are arranged in the following manner:—First, seven tubercles of equal size are placed in a longitudinal row on the median line of the upper surface, viz. five on the gastric, one on the cardiac, and one on the anterior part of the intestinal region.

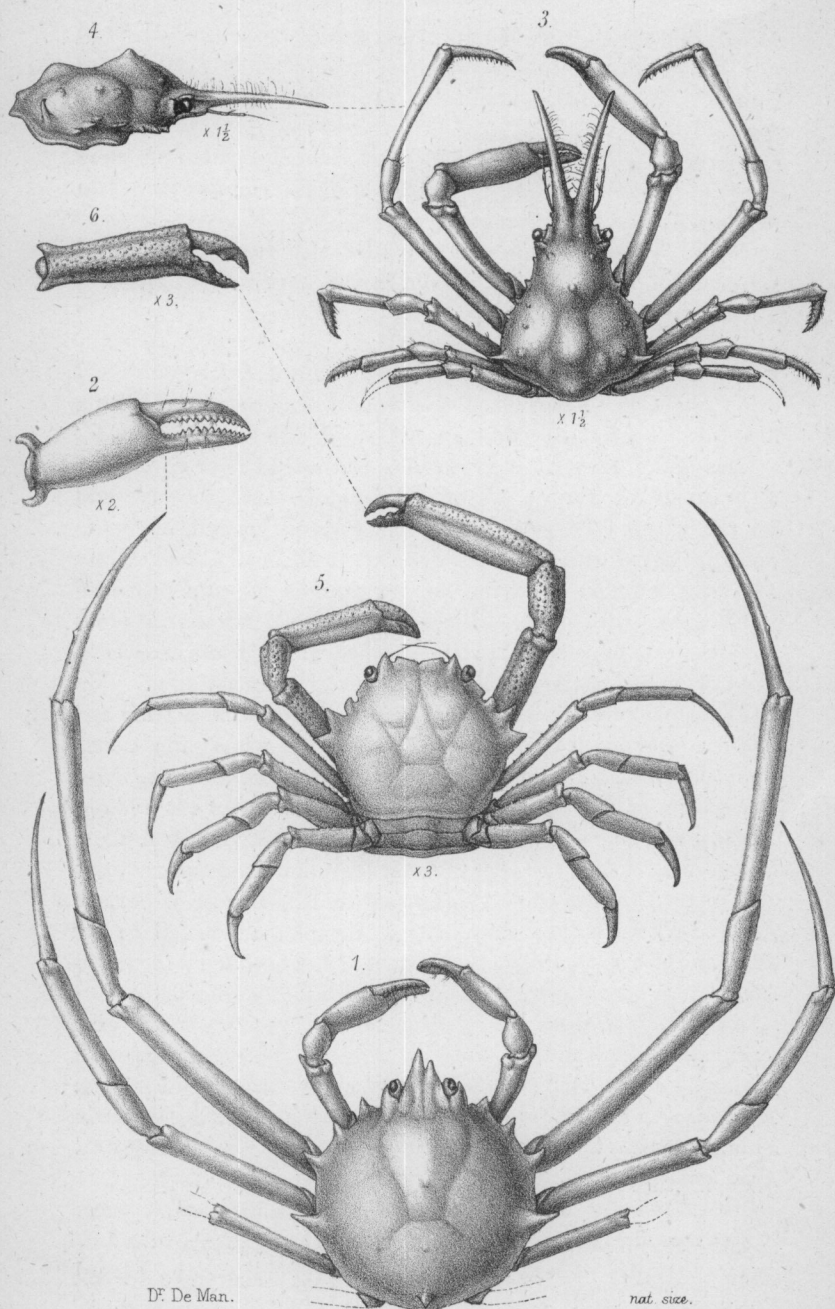
* Longitudinal distance from the posterior margin to a line which unites the eyes, so that the rostrum and the spine of the posterior margin are excluded.

The posterior tubercle of the five of the gastric region, that stands on the middle of the urogastric lobe, is situated exactly in the centre of the circular cephalothorax ; its distance from the next median gastric tubercle is greater than the distance of the latter from the third, while the distances between the three anterior tubercles are still somewhat smaller. Immediately before the foremost median gastric tubercle, two still more depressed rounded tubercles are found, situated close to one another in a transverse line and occupying the epigastric lobes. The protogastric lobes present a very small tubercle, placed on the side of and immediately behind the second gastric tubercle, and two or three other scarcely perceptible prominences more laterally. Each of the hypogastric lobes is also provided at its anterior angle with a very small tubercle equal in size to that of the protogastric lobes, and therefore also smaller than the median gastric prominences. Finally, some more or less acute tubercles are found on the hepatic, epi- and mesobranchial lobes.

As regards the under surface of the carapace, I may remark that it is wholly covered with the down which occurs in so many species of this genus, except the postabdomen, which is nearly smooth. The antero-lateral angles of the buccal cavity are armed with two nearly equal small spines, which are even a little shorter than the first antero-lateral spine of the carapace, being about the same size as the second. The postabdomen is composed of seven segments, of which the fourth, fifth, and sixth are coalescent ; their outer surface is minutely punctate, but the rest are smooth.

The chelipedes are equal and a little shorter than the cephalothorax, being about 32 millim. long ; the convex outer and inner surfaces of the hands are smooth, though minutely punctate, and the fingers nearly meet along their whole inner margins, presenting some small tufts of very short hairs on their outer and inner surfaces. In the male of this species the chelipedes are considerably larger. The legs of the second pair, measuring about 66 millim., are somewhat shorter than twice the length of the cephalothorax ; in the adult male they are, however, a little longer than twice the length of the cephalothorax, according to Fabricius's type. The other legs successively decrease in length. The legs are everywhere covered with a close down, except the terminal ends of the dactylopodites.

This specimen agrees perfectly with the typical specimen of *Inachus hybridus*, Fabr., except as regards the fourth (or last)



1, 2. *DOCLEA ANDERSONI*. 3, 4. *HYASTENUS HILGENDORFI*.
 Berjeau & Highley lith. 5, 6. *HARROVIA ELEGANS*.
Mintern imp.

antero-lateral spine, which in the typical specimen is the same size as the third, and in which it is directed slightly forward and upward. I, however, regard this small difference only as sexual, local, or individual.

As regards *Doclea hybridoida*, Blkr., I suppose it to be a mere variety of *Doclea hybrida*, characterized by the rudimentary state of the tubercles of the branchial regions.

Doclea hybrida having been recorded also from the coast of Coromandel, would appear to inhabit the north-eastern part of the Indian Ocean.

2. *DOCLEA ANDERSONI*, n. sp. (Pl. I. figs. 1 & 2.)

A single adult specimen was collected at Sullivan Island, together with the preceding species.

This new species closely resembles the *Doclea* figured by Seba (Thesaurus &c. t. iii. p. 41, tab. xvii. fig. 4), and I suppose it to be the same. The specimen from Sullivan Island, however, does *not* agree with Bleeker's description of *Doclea Sebæ*, Blkr., a species founded upon the same figure, as its upper surface is not armed with spines. Bleeker has pointed out that whereas the specimens he referred to *D. Sebæ* had spines, these structures are not found in the figure given in the 'Thesaurus.'

The cephalothorax is 29 millim. long (without the rostrum and the posterior spine) and 30 millim. broad (without the lateral spines). Presenting thus the same circular form as *Doclea hybrida*, our species at first sight may be distinguished by its much lower, less convex, more depressed cephalothorax. The cephalothorax, which in *D. hybrida* is semiglobular, in our new species is more disk-shaped. The whole (upper and under) surface is densely covered with a short woolly down. The rostrum has the same form and size as that of *D. hybrida*, extending as much forwards. The antero-lateral margins are armed with four rather acute short spines, which are arranged in the same manner as in the preceding species; the three anterior ones are nearly equally long, viz. 2-2½ millim., but the posterior tooth is a little longer (3½ millim.) and directed slightly forward and upward. This latter spine measures about half the breadth of the base of the rostrum (the transverse line that unites the internal angles of the supra-orbital fissures). The posterior margin of the carapace is armed with a median acute spine, directed backward and slightly upwards, which is nearly as long as the last antero-lateral spine. Though

the regions of the carapace are still distinctly indicated, the upper surface, however, appears less uneven than in *D. hybrida*, and nowhere presents dentiform tubercles except in the median line, where two minute scarcely prominent tubercles are found, one in the middle of the mesogastric and one nearly in the middle of the anterior cardiac region.

In its essential characters the under surface of the cephalothorax nearly resembles that of *D. hybrida*; but the two spines which in the latter are found on the sternum, between the legs of the second pair, are rudimentary or wanting in *D. Andersoni*.

The anterior legs or chelipedes, measuring 36 millim., are a little longer than the carapace. Regarding their form and structure they almost wholly resemble those of *D. hybrida*, the fingers nearly meeting along their whole inner margins; but the convex outer and inner surfaces of the hands are not only minutely punctate but also minutely granulate, when they are examined under a magnifying-glass; the palm is 9 millim. long and $4\frac{1}{2}$ millim. high, the fingers measuring 7 millim. As in *D. hybrida*, the fingers are covered on their outer and inner surfaces with some small tufts of very short hairs.

The legs of the second pair are 110 millim. long, and thus measure nearly four times the length of the carapace; as regards the shape and the relative length of their joints, I refer to the figure (Pl. I. fig. 1) or to that of Seba's 'Thesaurus.' The other legs are wanting. Except the propodites and the dactylopodites, the legs are everywhere covered with a close down.

Professor Anderson kindly compared for me this species with the type specimen of *D. Rissonii*, Leach, which is preserved in the British Museum, and he informs me that the lateral spines of the cephalothorax of *D. Rissonii* are fewer and not so strong as in our new species, that in *D. Rissonii* there are only three short spines on each side of the carapace, and that the posterior is the shortest. The median spine, which occurs on the posterior margin, is also feebler in the *Doclea* of Leach. As regards the ambulatory legs, the two species agree in many points. The cephalothorax of the type of *D. Rissonii* in the British Museum is $35\frac{1}{4}$ millim. long, and the legs of the second pair are respectively 123 and 130 millim. long, so that, as in *D. Andersoni*, they are nearly four times as long as the cephalothorax.

Doclea Andersoni may be distinguished from *D. hybrida*, Fabr., by the less elevated, disciform cephalothorax, by the shape and

direction of the spines of the antero-lateral and posterior margins, by the upper surface of the carapace being scarcely tuberculate, by the minutely granulate hands, and, finally, by the much more elongated legs.

I have much pleasure in dedicating this new *Doclea* to Professor Anderson.

3. *DOCLEA*, sp.

The Collection contains two other much smaller male specimens of a *Doclea*, also collected in the Mergui Archipelago.

These *Docleæ* are somewhat allied to the former species, but may be distinguished by the following characters:—first, the three anterior teeth of the antero-lateral margins are rather obtuse, being, however, also equal in length, but the last spine is comparatively much longer; secondly, the two minute, scarcely prominent median tubercles with which the upper surface of the cephalothorax of *D. Andersoni* is provided are represented in these specimens by two rather strong spines; and, thirdly, the second pair of legs are comparatively shorter than in that species.

As regards the shape of the carapace and the relative length and shape of the joints of the ambulatory legs, these specimens closely resemble *D. Andersoni*. The cephalothorax of the larger individual is 16 millim. long and 17 millim. broad; the three anterior teeth of the antero-lateral margins are scarcely 1 millim. long, but the acute posterior tooth, which is directed slightly forward and upward, measures $3\frac{1}{4}$ millim. The legs of the second pair, measuring $5\frac{1}{4}$ millim., are only a little longer than three times the length of the cephalothorax.

The carapace of the younger specimen is only $8\frac{1}{2}$ millim. long and 9 millim. broad. In this individual the two median spines, on the middle of the upper surface of the cephalothorax, are comparatively still longer, and the last tooth of the antero-lateral margins is 3 millim. long, so that it measures about a third of the breadth of the carapace. The second pair of legs are 25 millim. long, and thus precisely three times as long as the length of the cephalothorax. The median spine of the posterior margin is comparatively as long in these specimens as in *D. Andersoni*.

Finally I may add that in these specimens, as in the preceding species, the upper surface of the cephalothorax, especially of the

antero-lateral regions, presents some longer yellowish hairs among the dense down with which it is covered.

I do not venture to describe these specimens as a new species, as they are apparently very young.

As regards *Doclea muricata*, Fabr., of which I was enabled to examine the typical specimen preserved in the Museum of the University of Kiel, I will observe that this species is closely allied to *D. hybrida*. It differs, however, first, by the armature of the upper surface of the cephalothorax, the dentiform tubercles of *D. hybrida* being substituted in *D. muricata* by acute and longer spines; and, secondly, by the fourth antero-lateral spine being nearly twice as long as the third. The chelipedes of the male are, moreover, comparatively smaller. As regards the shape of the cephalothorax and the form and the length of the ambulatory legs, *Doclea muricata* much resembles *D. hybrida*, the legs of the second pair being even in the male a little shorter than twice the length of the cephalothorax.

GENUS HYASTENUS, *White*.

4. HYASTENUS HILGENDORFI, n. sp.* (Pl. I. figs. 3 & 4.)

(Compared by Dr. Hilgendorf, of the Zoological Museum of Berlin, with the typical specimens of *Hyastenus Pleione*, Herbst.)

Four specimens (2 ♂, 2 ♀) of this new species are in the Collection, of which two (♂ ♀) were collected at Elphinstone Island and two (♂ ♀) at King Island Bay.

This new *Hyastenus* is closely allied to *Hyastenus Pleione*, Herbst. Dr. Hilgendorf, kindly compared for me one of the four specimens, a male, which I had sent him, with the (four) typical specimens of Herbst's *Cancer Pleione* and communicated to me the characters by which this new species differs from that of Herbst. I therefore have much pleasure in dedicating this *Hyastenus* to the learned carcinologist of Berlin. As regards its outer appearance, our new species much resembles *H. Pleione*, Herbst, and *H. diacantha*, de Haan; it may, however, easily be

* I was unable to compare the description of *Lepidonaxia Deflippii* of Targioni-Tozzetti, a species described in 1877 in the 'Zoologia della Magenta'; according to Mr. Miers, however, this species may probably be regarded as a mere variety of *H. oryx*, A. M.-Edw. (Zoology of H.M.S. 'Alert,' 1884, p. 195).

distinguished by the longer spines of the rostrum, and from Herbst's species moreover by the direction of these spines.

The cephalothorax is subpyriform, triangular, much more narrowed anteriorly than the cephalothorax of *H. oryx*, A. M.-Edw., and even a little more than that of *H. Pleione*. In the largest specimen (which I am describing) the proportion of the length* of the cephalothorax to the distance between the external angles of the orbits is as 9 to 4, whereas in *H. Pleione* it is as 5 to 2. In the new species the proportion of the length of the cephalothorax to the breadth (measured a little before the lateral epibranchial spines, where the carapace is broadest) is as 15 to 13. The gastric and the anterior cardiac regions are each elevated into a convex, rounded tubercle, both of which are about equally prominent. Between these two tubercles a small median transverse tubercle occurs in *H. Pleione*, which is not found in this species. The posterior cardiac region also rises into a small blunt median tubercle, directed obliquely backwards, and on each side of it an elevated line is observed running parallel with the posterior margin of the cephalothorax.

In *H. Hilgendorfi* there is no median longitudinal series of spines on the upper surface of the cephalothorax. In *H. Pleione*, on the contrary, the posterior cardiac region rises into an acute spine. Immediately behind the imaginary line which unites the fissures of the supraorbital margins with one another, in *H. Pleione* five small, blunt, semiglobular tubercles or spines are found on the anterior declivity of the great gastric tubercle, arranged in an arcuate line; in our new species only the two lateral tubercles of this group are found, while the three middle ones are almost completely wanting. The epibranchial spine, with which each side of the cephalothorax is armed behind the middle of the lateral margins, in our species is comparatively much stronger, acute, and curved upwards; an imaginary line, which unites the bases of the two epibranchial spines with one another, crosses the posterior declivity of the anterior cardiac region. Between the anterior cardiac tubercle and the epibranchial spines two small, scarcely prominent, blunt tubercles are found on each side of the former, lying in an oblique direction; two imaginary lines, which unite the tubercles of

* The length of the carapace is the distance between the posterior margin of the cephalothorax and a transverse imaginary line, which unites the anterior angles of the supraorbital margins.

each pair, meet one another posteriorly at the tubercle of the posterior cardiac region. The anterior one of these two tubercles, that lies on the mesobranchial region, is rather acute in *H. Pleione*, and the posterior, though also blunt and obtuse, is nevertheless more prominent in Herbst's species. The epibranchial lobes, which are situated on each side of the cervical suture, are provided in *H. Hilgendorfi* each with two small, little prominent, obtuse tubercles, lying behind one another; in *H. Pleione* these two tubercles are conical and acute. Immediately behind the external angles of the orbits a small dentiform, rather obtuse tubercle is found on the hepatic region of the cephalothorax, which also occurs in *H. Pleione*. The lateral sides of the upper surface of the cephalothorax are moreover armed in our species, as in *Pleione*, with some small dentiform tubercles, which are situated behind the tubercles of the epibranchial and hepatic regions and the bases of the legs, close to the latter. One of these dentiform tubercles is found, in both species, quite above the base of the chelipedes; behind this tubercle in *H. Hilgendorfi* four small dentiform tubercles occur, whereas in *H. Pleione* there are only two. I may add that these four tubercles are arranged rather irregularly and that they are often of a somewhat different size. Between the external angle of the anterior margin of the buccal cavity and the dentiform tubercle, which is found above the base of the anterior legs, in both species, two other dentiform tubercles occur, the anterior of which is twice as broad as the posterior.

The spines of the rostrum are comparatively a little longer than those of *H. Pleione* (Dr. Hilgendorf informs me that the rostral spines have been drawn too long in Herbst's figure of *H. Pleione* (pl. lviii. fig. 5). In the male of our species the proportion of the length of the cephalothorax to the distance of the two parallel imaginary lines, which unite respectively the tips of the rostral spines and the anterior angles of the supraorbital margins, is as 15 to $11\frac{1}{4}$; in the female individuals this proportion is as 15 to $7\frac{1}{2}$. The rostral spines are thus comparatively shorter in the female; but I may observe that this condition may perhaps be ascribed to the younger age of the female specimens, which are much smaller than the male. The rostral spines are quite as divergent as those of *H. oryx* (Nouv. Arch. du Muséum Hist. Nat. t. viii pl. 14. fig. 1). In *H. Hilgendorfi* the rostral spines are directed nearly horizontally forward, so that they make a very

obtuse angle with the anterior declivity of the gastric region. In *H. Pleione*, on the contrary, the spines are directed more downwards, so that they are situated in the prolongation of the oblique surface of the anterior declivity of the gastric region. When the tips of the two rostral spines are united by an imaginary line and the antero-internal angles of the supraorbital margins by another, the proportion of the distance between these two imaginary lines to the distance between the antero-internal angles of the supraorbital margins is as 8 to 3; in the smaller female individuals this proportion is as 5 to 3, because the rostral spines are comparatively shorter. The basal antennal joint is a little narrower in this species than in *H. Pleione*, and its external margin is also of a somewhat different shape. In Herbst's species the epistome is comparatively a little shorter, and it therefore appears a little more enlarged; in this species (the male) the epistome is $1\frac{1}{2}$ millim. long, and the distance between the postero-internal angles of the orbits is $4\frac{1}{2}$ millim., and therefore three times as broad as the length of the epistome. Immediately behind the postero-internal orbital angles a small dentiform tubercle is found, lying between these angles and the antero-external angles of the buccal cavity. The penultimate joint of the peduncle of the external antennæ is twice as long as the terminal joint. The outer maxillipeds and the male abdomen much resemble those of *H. oryx*.

The chelipedes are scarcely longer than the length of the body (the spines of the rostrum included). The upper margin of the arm is provided above, at the proximal extremity, with two dentiform tubercles situated very near to one another. The wrist presents a small tubercle at its internal angle, and one or two on its upper surface. The hands are rather slender, being nearly five times as long as high, the fingers (which are about half as long as the palm) included. The scarcely sinuous upper and under margins of the palm are parallel to one another; the hands are quite smooth and glabrous. The inner edges of the fingers are minutely denticulate and a little gaping at the base.

The ambulatory legs much resemble those of *H. oryx*. Those of the first pair are about once and a half as long as the whole body, and the other legs are successively shorter; so that the ambulatory legs of the last pair are only once and one third the length of the cephalothorax (exclusive of the rostral spines).

The dactylopodites are armed with a row of acute spinules along their inner margins; these spinules gradually increase in length towards the tip.

In the smaller (female) specimens the anterior legs are comparatively smaller.

In *H. Pleione* the hands of the male are a little shorter in proportion to the length of the cephalothorax than in this species, and they also present a somewhat less slender form.

The body of this *Hyastenus* is covered with a short pubescence on which some longer curved hairs are distributed; similar longer hairs also occur on the spines of the rostrum and on the ambulatory legs.

Dimensions of the larger male specimen:—	millim.
Length of the whole body	26½
Length of the cephalothorax	15
Distance between the external orbital angles	6½
Breadth of the cephalothorax	13
Distance between the antero-internal angles of the supraorbital margins	4½
Distance between the tips of the spines of the rostrum	7
Length of the anterior legs	30
Length of the hands (the fingers included)	12½
Length of the first pair of ambulatory legs	39
Length of the last pair of ambulatory legs	20

5. HYASTENUS PLEIONE, *Herbst*.

Cancer Pleione, *Herbst*, *Naturgeschichte der Krabben und Krebse*, t. iii. p. 52, Taf. lviii. fig. 5.

Naxia Pleione, *Gerstäcker*, *Carcinologische Beiträge*, 1856, p. 114, Taf. v. figs. 1 & 2.

Hyastenus Pleione, *A. Milne-Edwards*, *Nouv. Arch. du Muséum Hist. Nat.* t. viii. p. 250.

The Collection contains four small specimens of a *Hyastenus*, which I refer to *Herbst's II. Pleione*, as they present almost all the characters of this species, communicated to me by Dr. Hilgendorf. These individuals were collected at Sullivan Island.

The largest specimen is only 15 millim. long (the rostral spines included); a female, already bearing eggs, is only 10 millim. long, including the spines of the rostrum. The spines of the rostrum are directed downward, so that they lie in

the prolongation of the oblique surface of the anterior declivity of the gastric region. In the largest specimen (15 millim. long), a male, the cephalothorax is 10 millim. long; so that the proportion of the length of the cephalothorax to that of the rostral spines is nearly as 15 to 7, whereas in *H. Hilgendorfi* this proportion is as 15 to $11\frac{1}{4}$; the spines are thus comparatively much longer in this species. The posterior cardiac lobe rises into an acute spine.

Genus NAXIA, *M.-Edw.*

6. NAXIA (NAXIOIDES) PETERSII, *Hilgendorf.*

Podopisa Petersii, *Hilgendorf*, *Monatsb. Acad. Wissensch. Berlin*, Nov. 1878, p. 785, Taf. i. fig. 1-5.

Naxia (*Naxioides*) *Petersii*, *Miers*, *Report on the Zool. Collections made in the Indo-Pacific Ocean during the Voyage of H.M.S. 'Alert,' 1884*, p. 523.

A young female specimen of this species was forwarded to Dr. Anderson from the Andaman Islands, and I therefore include it. As it agrees completely with Hilgendorf's description and figure, I will only add the following remarks:—The spine on the intestinal region appears rather obtuse, whereas in Hilgendorf's adult specimen it is more acute. As in his specimen, the spines of the rostrum seem to be broken off; they have almost the same length, are nearly parallel to one another, and are comparatively shorter than in the specimen in the Berlin Museum, for they do not reach as far forward as the peduncle of the external antennæ. Each spine is armed on its dorsal surface with a very small accessory spine, somewhat as in *Naxioides hirta*, *A. M.-Edw.* These antennal peduncles, which in the Berlin specimen were unequally developed, are quite equal to one another in the Andaman specimen; their terminal joint is little more than half as long as the penultimate joint, and the flagella are scarcely so long as the two terminal joints taken together. The flagella bear a few long hairs on their inner side; and the two last joints of the peduncle are clothed with many hooked hairs.

The anterior legs are comparatively much smaller than in the male, but present nearly the same form. The length of the cephalothorax to the base of the rostral spines is about 26 millim., and the distance between the tips of the posterior branchial spines, indicating the greatest width of the carapace, amounts to

22 millim.; the legs of the second pair are about twice as long as the cephalothorax, measuring 58 millim.

Mr. Miers presumes that this species is identical with *Naxioides hirta*, A. Milne-Edw., from Zanzibar; I think he is right.

As *Naxia* (*Naxioides*) *Petersii* has been observed on the coast of Mozambique and at the Amirante Islands, it would appear to occur throughout the whole northern Indian Ocean.

GENUS SCHIZOPHRYS, *White*.

7. SCHIZOPHRYS ASPERA, *H. M.-Edw.*

Mithrax asper, *Milne-Edwards*, *Hist. Nat. des Crustacés*, t. i. p. 320 (1831).

Maja (Dione) *affinis*, *de Haan*, *Fauna Japonica*, p. 94, t. xxii. fig. 4.

Schizophrys aspera, *Stimpson*, *Amer. Journ. of Science and Arts*, January 1860.

Schizophrys aspera, *Alph. Milne-Edwards*, *Crustacés de la Nouv.-Calédonie*, *Nouv. Arch. du Muséum Hist. Nat.* t. viii. 1872, p. 231, pl. x. fig. 1 (with the other synonyms).

Three specimens are in the Collection, viz. one adult female provided with eggs, found at King Island Bay, and a smaller sterile female and a very young male from Elphinstone Island.

The cephalothorax of the adult specimen is 54 millim. long (the rostrum included) and 41 millim. broad (without the lateral spines). It belongs to that common variety in which the rostrum consists of two long and straight spines that are each provided with a short, external, obliquely directed accessory spine at the base. The upper surface of the carapace is granular, nowhere spinose.

Schizophrys aspera has been recorded from Zanzibar (*Milne-Edwards*), Madagascar (*Milne-Edwards*), Mauritius (*White*), the coast of Malabar (*Milne-Edwards*), Borneo (*Dana*), Torres Strait (*Haswell*), New Caledonia (*Milne-Edwards*), Navigator Islands (*Milne-Edwards*), and Japan (*de Haan* and *Stimpson*).

This species may thus be said to occur throughout the whole Indo-Pacific region.

GENUS MICIPPA, *Leach*.

8. MICIPPA HAANII, *Stimps.*

Pisa (*Micippa*) *Thalia*, *de Haan*, *Fauna Japonica*, p. 98, pl. xxiii. fig. 3.

Micippa Haanii, Stimpson, *Prodromus descript. Animal. evertebr. que in Exped. ad Oceanum Pacif. sept. observ. et descripsit*, Proc. Acad. Nat. Sci. Philadelphia, Dec. 1857, p. 217.

One very young male specimen was collected in the Mergui Archipelago.

Family PARTHENOPIDÆ.

Genus LAMBRUS, Leach.

9. LAMBRUS LONGIMANUS, H. M.-Edw.

Cancer macrochelos, Seba, *Thesaurus*, t. iii. pl. xix. figs. 1, 8, & 9.

Lambrus longimanus, Milne-Edwards, *Hist. Nat. des Crustacés*, t. i. p. 354, and Cuvier, *Règne Animal, Crustacés*, pl. xxvi. fig. 1.

Lambrus longimanus, Bleeker, *Recherches sur les Crustacés de l'Inde Archip.*, Batavia 1856, p. 17.

Lambrus longimanus, Miers, *On some Species of Maioid Crustacea*, Ann. & Mag. Nat. Hist. 1879, 5th ser. vol. iv. p. 20.

Four specimens were collected in the Mergui Archipelago, one of which, a very young individual, was found at Owen Island. One young specimen is infested with a Bopyrid.

They completely agree with the above quoted descriptions and figures. Without doubt the species which Milne-Edwards described as *L. longimanus* is identical with that of which Miers has lately given a more extensive description.

This species has been observed at Mauritius, Java (*Miers*), Amboina, Pondicherry, Philippine Islands (*Bumphius*, *Milne-Edwards*), Sumatra, Banka (*Bleeker*).

Genus HARROVIA, Ad. & White.

10. HARROVIA ELEGANS, n. sp. (Pl. I. figs. 5 & 6.)

One single female individual of this new species was collected at Elphinstone Island.

This species is closely allied to the two other species of *Harrovia*, viz. *H. albolineata*, Adams and White, and *H. tuberculata*, Hasw.; but it may be easily distinguished by the form of the antero-lateral teeth of the cephalothorax, by the structure of the legs, and by some other characters.

As regards its outer physiognomy, this species much resembles *H. albolineata*. The upper surface of the cephalothorax is hexagonal, and the distance between the last antero-lateral teeth is scarcely once and a half the length of the carapacc. The upper surface is a little convex, smooth, though minutely

punctate when seen under a lens, and densely tomentose; the interregional grooves are faintly indicated, though they distinctly separate the somewhat prominent protogastric lobes from one another, from the mesogastric lobe, and from the adjacent hepatic and epibranchial regions. The cervical suture, which separates the gastric from the cardiac region, is also distinct; and an impressed line is found close to and parallel to the posterior margin of the cephalothorax. This posterior margin is slightly emarginate in the middle.

The front has the characteristic form of the other *Harroviæ*, being divided by a small median triangular incision into two truncated lobes, which have minutely granulated anterior margins. As in the other species of this genus, the internal angles of the upper orbital margins constitute a strong conical acute tooth on each side of the front; whereas the front is much deflexed downward, these acute intraorbital teeth are directed straight and horizontally forwards and project slightly beyond the front, as in *H. tuberculata*.

The antero-lateral margins are nearly as long as the postero-lateral; they are divided into four teeth, the first, or anterior, of which is formed by the external orbital angle, which is not at all prominent; this first tooth or lobe is rather broad and truncate, its external margin being straight or scarcely slightly emarginate. The second tooth is also blunt or truncate, but is much narrower than the first, from which it is separated by a rather deep incision. The third tooth is the largest of all, conical and acute; the last tooth resembles the third, but is a little smaller. The postero-lateral margins are slightly convex. The anterior margin of the buccal cavity is slightly emarginate on each side, and the endostome is longitudinally ridged, a clearly-marked ridge occurring on each side. The inflected sides of the cephalothorax are also tomentose. The abdomen (of the female) closely resembles that of *H. albolineata*, being seven-jointed; all the joints are distinctly separated from one another, and the lateral margins of the abdomen are fringed with short hairs.

The slender anterior legs much resemble those of the species which was described by Adams and White. They are unequal in length and in size, the right being somewhat the larger. The right leg measures nearly three times the length of the cephalothorax. Both legs are everywhere granular, except on the inner surface of the palm, which appears almost smooth. The arms

are covered with more or less acute granules, a single somewhat larger granule being found at the end of the proximal third of the anterior margin, and another similar granule at the end of the proximal third of the upper margin. The wrist, about twice as long as broad, is everywhere granular, but does not present a tubercle above, as seems to occur in *H. albolineata*. The larger hand resembles that of the last species. The fingers are about half as long as the palm, which presents a longitudinal groove on its granulated outer surface, close to and parallel with the upper margin, and another similar groove below near the under margin; these grooves extend from the articulation with the wrist to the fingers. Two similar grooves are found on the equally convex, though almost smooth, inner surface of the palm. The fingers have acute tips which are perfectly close together; they are longitudinally grooved, and the mobile finger is granular on its upper margin, and the index also at the base of its outer surface. The sharp inner edges are somewhat denticulate. The other chelipede, which is a little smaller, presents the same characters.

The ambulatory legs and joints are very similar to those of *H. albolineata*, as regards their shape and length, but the meropodites are armed on their upper margins with a row of small acute spinules, whereas there is no tooth at the distal end of the upper border.

Dimensions:—

	millim.
Length of the cephalothorax	$6\frac{3}{5}$
Distance between the last antero-lateral teeth	$9\frac{1}{4}$
Distance between the external orbital angles	5
Length of the larger chelipede	18
Length of the larger hand (the fingers included) . .	$8\frac{1}{2}$
Breadth (height) of the palm at the base of the fingers.	2

Harrovia albolineata has been recorded from Borneo, Hongkong, and the Philippine Islands; *H. tuberculata* from Australia (Daruley Island, Torres Strait). All the species of this interesting genus are thus inhabitants of the Indian seas.

Subtribe *Cyclometopa*.

Family CANCRIDÆ.

Genus ATERGATIS, de Haan.

11. ATERGATIS INTEGERRIMUS, Lam.

Cancer integerrimus, Lamarck, *Histoire des Animaux sans Vertèbres*, t. v. p. 273.

Cancer integerrimus, Milne-Edwards, *Hist. Nat. des Crustacés*, t. i. p. 374, and *Atlas du Règne Animal de Cuvier*, pl. xi. bis, fig. 1.

Atergatis integerrimus, de Haan, *Fauna Jap., Crustacea*, p. 45, pl. xiv. fig. 1.

Atergatis subdivisus, Adams and White, *l. c.* p. 38, pl. viii. fig. 3.

Atergatis integerrimus, Alph. Milne-Edwards, *Etudes Zoologiques sur les Crustacés récents de la Famille des Cancériens*, *Nouv. Arch. du Muséum Hist. Nat.* t. i. 1865, p. 235.

Three young male specimens are in the Collection, two of which were collected at Owen Island, and the third at King Island.

Dimensions of these specimens :—

	1.	2.	3.
	millim.	millim.	millim.
Length of the cephalothorax . . .	22	18	10½
Breadth of the cephalothorax . .	36	30½	18½

This species has been recorded from Zanzibar, Ceylon, Java, the Philippine Islands, Hongkong, and Japan. Its geographical distribution therefore embraces the whole Indian Ocean and the Chinese and Japanese seas.

12. ATERGATIS FLORIDUS, Rumph.

Cancer floridus, Rumphius, *D'Amboinsche Rariteitkamer*, p. 16, pl. viii. fig. 5 (1705).

Cancer Oeyroe, Herbst, *l. c.* pl. liv. fig. 2.

Cancer Oeyroe, Milne-Edwards, *Hist. Nat. des Crustacés*, p. 375.

Atergatis floridus, de Haan, *l. c.* p. 46; Stimpson, *l. c.* p. 30.

Atergatis floridus, A. Milne-Edwards, *Nouv. Arch. du Muséum Hist. Nat.* t. i. p. 243; Heller, *Crustaceen der Novara-Reise*, p. 8.

Eleven specimens of different sizes were collected in the Mergui Archipelago, two at Elphinstone Island, eight at Owen Island, and one at King Island Bay. The largest was collected at Elphinstone Island, and its cephalothorax is 57 millim. broad; the carapace of a female, which is provided with eggs, is 37 millim. broad.

A widely distributed tropical species, recorded from the Red

Sea, Natal, Java, Amboina, New Caledonia, Tahiti, Loo-Choo Islands, and Japan.

GENUS *CARPILODES*, *Dana*.

13. *CARPILODES STIMPSONI*, *A. Milne-Edw.*

Carpilodes Stimpsonii, *A. Milne-Edwards*, *Nouv. Arch. du Muséum Hist. Nat.* t. i. p. 232, pl. xi. fig. 2 (1865), and *Nouv. Arch. du Muséum Hist. Nat.* t. ix. p. 181.

Two male specimens were collected at Elphinstone Island. They agree very well with the original description, but the upper and external surface of the hands is not a little granular, but only rugose, and the penultimate joint of the abdomen in both individuals is quadrate, as long as broad, and resembles that of *Carpilodes venosus*, *Milne-Edw.*; while in New-Caledonian specimens, according to the figure given by *A. Milne-Edwards*, this joint is a little broader than long.

The cephalothorax of the larger specimen is $13\frac{3}{4}$ millim. broad and 8 millim. long.

This species is most closely allied to *Carpilodes venosus*, *M.-Edw.* (= *Carpilodes obtusus*, *de Haan*), for the latter appears to be only distinguished by the upper surface of the carapace and of the hands being wholly smooth.

Carpilodes Stimpsoni has hitherto been only recorded from the shores of New Caledonia.

GENUS *ACTÆA*, *de Haan*.

14. *ACTÆA AREOLATA*, *Dana*.

Actæa areolata, *Dana*, *United States Exploring Expedition, Crustacea*, t. i. p. 162, pl. viii. fig. 1.

Actæa areolata, *Alph. Milne-Edwards*, *Nouv. Arch. du Muséum Hist. Nat.* t. i. p. 264.

One male specimen was collected at Elphinstone Island.

Though doubtless belonging to this species, it presents nevertheless two slight differences from *Dana's* figure which are worthy of notice, as being probably caused by the fact that this specimen had not yet attained its full size. The front projects a little more forward, and the most internal lobule of the protogastric lobe (areola 2 M), which is adjacent to the mesogastric lobe, is scarcely broader than the latter, while this lobule in *Dana's* figure appears nearly twice as large as the mesogastric lobe.

The cephalothorax of this specimen is $13\frac{3}{4}$ millim. broad and

8 $\frac{1}{4}$ millim. long (exclusive of the basal portion of the abdomen). The pterygostomian regions are sulcate in this species.

Actæa areolata has previously been recorded from the Sooloo Sea or Balabac Straits.

15. *ACTÆA RUFOPUNCTATA*, *M.-Edw.*

Xantho rufopunctatus, *Milne-Edwards, Hist. Nat. des Crustacés*, t. i. p. 389.

Actæa rufopunctata, *Alph. Milne-Edwards, Nouv. Arch. du Muséum Hist. Nat.* t. i. p. 268, pl. xviii. fig. 1.

Actæa pilosa, *Stimpson, l. c.* p. 31, and *A. Milne-Edwards, l. c.* p. 265.

Six fine specimens (three ♂, three ♀) are in the Collection, four of which were collected at King Island Bay, while the two other male specimens were found at Elphinstone Island.

The cephalothorax of an ova-bearing female is 28 millim. broad and 20 $\frac{1}{2}$ millim. long. These numbers in an adult male are respectively 32 millim. and 23 millim.

I refer these specimens to the common Indian *Actæa rufopunctata*, as they nearly completely present the striking characters of that species. In all these specimens, however, the whole upper surface of the cephalothorax and the outer surface of the legs, besides being clothed with a short close down, similar to that of *A. tomentosa*, are moreover covered with longer yellowish-brown hairs, which were not described by the French carcinologist; and, secondly, the cardiac region of the upper surface of the cephalothorax never shows even a trace of a median groove, which is visible in Milne-Edwards's figure.

The specimens are of a yellowish colour, and marked with red spots on the carapace and on the legs. The individuals which I described some time ago under the name of *A. rufopunctata* (Notes from the Leyden Museum, vol. ii. p. 172, and vol. iii. p. 96) seem to belong to the same species, but the median frontal lobes are less prominent in the Red-Sea specimens, a difference which may probably be ascribed to their being younger. Nevertheless, the small size of these specimens, already bearing eggs, is very remarkable.

Actæa pilosa, Stimpson, from Hongkong is, in my opinion, identical with *A. rufopunctata*. As regards *Actæa Kraussi*, Ueller, from the Red Sea and from the Island of Bourbon, I may observe that it differs from these specimens by its comparatively more enlarged cephalothorax, by the subhepatic regions

being sulcated (as in *A. hirsutissima* and *A. areolata*), and by many other details in the structure of the legs.

Actæa rufopunctata has been recorded from Mauritius, Ceylon, Cocos Island, the Fiji and Samoa Islands, the Red Sea, the African coast of the Mediterranean, and even from the Canary Islands. Mr. Miers records its probable occurrence at Madeira and in the South Atlantic.

16. *ACTÆA PARVULA*, de Haan.

Menippe parvulus, de Haan, *Faun. Japon.*, *Crustacea*, p. 21.

Menippe parvulus, Krauss, *Die südafrikanischen Crustaceen*, 1843, p. 34, tab. ii. fig. 2.

Three fine specimens of this apparently very rare species are in the Collection. They were all obtained at Owen Island.

Their measurements are as follows :—

	1.	2.	3.
	millim.	millim.	millim.
Length of the cephalothorax . .	16	13	14
Breadth of the cephalothorax .	22½	18	20

They completely agree with the description and with the accurate figure published by Krauss, whose specimens were collected on the coast of Natal, and determined by M. de Haan himself. This species, which belongs to the genus *Actæa*, as characterized by M. Alph. Milne-Edwards, was not taken up by this eminent carcinologist in his Monograph of these Crabs.

Actæa parvula, de Haan, is evidently closely allied to *Actæa setigera*, M.-Edw., from the West Indies, and seems to represent that form in the Indian Ocean. This species may, however, be easily distinguished by a somewhat less enlarged carapace, by the nearly straight postero-lateral margins, and also by some other characters.

As regards the proportion of the length and the breadth of the cephalothorax, this may be expressed by the numbers 47 and 64. The anterior half of the upper surface of the carapace is very convex longitudinally, but the posterior half appears much depressed and flattened, as well longitudinally as transversely. The regions are only distinctly indicated on the two anterior thirds of the upper surface and separated from one another by rather deep interregional grooves, but behind a transverse imaginary line bordering the urogastric lobe the surface appears everywhere depressed, undivided by grooves, and uniformly covered

with small, equal, rounded granules. As in *Actæa setigera*, each protogastric region is divided by a longitudinal groove into two subequal lobes. All the lobes of the two anterior thirds of the upper surface are covered with rather coarse, somewhat conical granules, which are even a little larger on the antero-lateral regions than on the gastric lobes. The whole upper surface of the carapace is covered, moreover, by rather long yellowish hairs. The granulated anterior margin of the strongly deflexed, four-lobed front is divided by a deep, narrow, median incision into two halves, each of which is broadly emarginate, so that the frontal margin presents two median, obliquely truncate, large lobes, and two lateral, small, dentiform ones, which are prolonged towards the basal joint of the external antennæ, with which they unite.

As in *A. setigera*, the antero-lateral margins are very indistinctly divided into four lobes (besides the external angle of the orbit): the three anterior lobes are very broad, the last is very small, and all are provided with coarse conical granules equal to those of the adjacent antero-lateral regions. As in *A. hirsutissima* and *A. areolata*, the convex hairy, scarcely granular, subhepatic regions present some narrow grooves, which are prolongations of the fissures that divide the antero-lateral borders. In the male the outer surface of the sternum and of the postabdomen appears rather coarsely punctate, and also somewhat hairy, and the penultimate joint of the latter is a little longer than broad, and a little longer than the terminal segment.

The arms of the equal chelipedes are almost entirely covered by the cephalothorax, and their rounded under surface is somewhat granular. The outer and upper surface of the wrist is covered with numerous conical granules, which resemble those of the antero-lateral regions on the upper surface of the carapace. Also the upper and outer surfaces of the hands present similar conical granules, which are often arranged in longitudinal rows; but their scarcely convex inner surface appears almost smooth, presenting only some few depressed small granules in the middle. The fingers of one of the specimens, which are preserved in alcohol, are of a black colour, those of the two other individuals are brown; in the specimen described by Krauss they presented a somewhat yellowish colour. In this species the colour of the fingers does not extend on the surface of the palm; in *A. setigera* it extends on the palm, according to the description

of A. Milne-Edwards. The mobile finger is a little longer than the other; both are pointed, sulcate, and punctate, and they are a little granular and hairy at the base; they are armed along their inner margins with some teeth, which are rather feeble in the female specimen, but strong in the male. The index of the latter is armed with a very strong tooth near the middle, and, moreover, with two or three smaller teeth between the first and the point; the mobile finger presents about six teeth, the two basal ones of which are a little larger than the others. These teeth, like the pointed tips, are of a white colour, and the inner surface of the index is provided with a tuft of short hairs.

Regarding the other legs, I refer to the accurate figure of Krauss; the joints are granular along their upper and under surfaces or margins. The chelipedes, as well as the ambulatory legs, are provided with tolerably long yellow hairs, which resemble those of the carapace.

As regards *Cancer scaber*, Fabricius (Suppl. Entom. Syst. p. 336), I may observe that it is doubtless a different species, distinguished at first sight from *A. parvula* by its unequal chelipedes, besides some other characters. But *A. parvula* cannot be identified with Milne-Edwards's *Xantho scaber* (l. c. p. 390), a species described as being closely allied to *A. setigera*, although it has been referred to Fabricius's species, because it has not been included among the species of *Actæa* described by Prof. A. Milne-Edwards in his Monograph of this genus.

Actæa parvula, de Haan, so far as I know, has hitherto been found only at the Cape and on the rocky coast of Natal.

17. ACTÆA, sp.

The collection contains a small mutilated specimen of a species of *Actæa* which I am unable to determine. This individual is only 7 millim. long and 10½ millim. broad. It is closely allied to *A. parvula*, but the whole upper surface of the cephalothorax is lobed, the meropodites of the ambulatory legs are comparatively more enlarged, and the legs are covered with much larger, though also conical, granules.

This specimen, however, which was collected at Elphinstone Island, may prove to be the young of the preceding species.

Genus EUXANTHUS, Dana.

18. EUXANTHUS MAMILLATUS, M.-Edw.

Cancer mamillatus, Milne-Edwards, *Hist. Nat. Crustacés*, p. 376.

Euxanthus mamillatus, *Alph. Milne-Edwards, Nouv. Arch. du Muséum Hist. Nat.* t. i. p. 292, pl. xv. fig. 2, & t. ix. p. 196.

Four specimens are in the Collection, two of which were collected at Owen Island and two at Elphinstone Island.

I am inclined, with Milne-Edwards, to regard *Euxanthus melissa*, Herbat, *E. nitidus*, Dana, and *E. mamillatus*, M.-Edw., as varieties of the same species. An adult male specimen, the cephalothorax of which is 32 millim. long and 49 millim. broad, wholly agrees with the description of true *E. mamillatus*, M.-Edw., but in younger specimens, about 21-24 millim. in breadth, the elevations of the upper surface of the carapace are somewhat more rugose. I now suspect that in young specimens of these crabs the bosses are always a little rugose, and that they become nearly smooth in adult specimens of *E. mamillatus*, while they remain rugose and become even still more so in the form which has been described as *E. Huonii*, Lucas.

Euxanthus mamillatus has hitherto been recorded from the coast of Cochin China and from Australia.

Genus XANTHO, Leach.

19. XANTHO IMPRESSUS, Lam.

Cancer impressus, Lamarck, *l. c.* p. 272.

Xantho impressus, Milne-Edwards, *Hist. Nat. Crustacés*, t. i. p. 393.

Xantho impressus, *Alph. Milne-Edwards, Crustacés de la Nouv. Calédonie, Nouv. Arch. du Muséum Hist. Nat.* t. ix. p. 198, pl. vi. fig. 2.

One young male specimen was collected near Owen Island, the cephalothorax of which is 22 millim. long and 38 millim. broad.

This very rare species has been collected also at Mauritius and on the shores of New Caledonia, so that we may conclude that it is distributed throughout the Indian Ocean and the Malayan archipelago.

Genus MEDEUS, Dana.

20. MEDEUS DISTINGUENDUS, de Haan.

Cancer (*Xantho*) *distinguendus*, de Haan, *Fauna Japonica, Crustacea*, p. 48, tab. xiii. fig. 7.

Chlorodius distinguendus, Stimpson, *l. c.* p. 32.

Xantho distinguendus, Heller, *Beiträge zur Crustaceen-Fauna des rothen Meeres, Sitzungsber. k. Acad. Wiss. Wien*, Bd. xliii. 1861, p. 323.

Eleven specimens (6 ♂, 5 ♀) were collected, eight at Elphin-stone Island and three at King Island Bay.

These specimens, which are doubtless very young, agree so well with the description and the figure of *Xantho distinguendus* in the 'Fauna Japonica,' that I have no hesitation in regarding them as identical with it. They seem only to differ a little from the Japanese specimens in the meropodites of the ambulatory legs being less distinctly granulated, and in the upper margin of these joints being slightly carinate.

I have little else to add to the existing description, this species having been well figured by de Haan. The postero-lateral sides of the carapace are distinctly granulate, the cardiac region appears smooth to the naked eye, but minutely granulate and punctate when it is seen under a magnifying-glass. The penultimate joint of the male abdomen is nearly quadrate, with the lateral margins slightly concave.

Stimpson was in error in referring this species to the genus *Chlorodius*, and in supposing it to be probably a variety of *Leptodius exaratus*, the fingers of the anterior legs being pointed and not at all excavated. *Leptodius exaratus*, moreover, is a quite different species.

I refer de Haan's *Xantho distinguendus* to the genus *Medæus*, because it agrees perfectly in its physiognomy and outer appearance with the other representatives of the genus, as, e. g., *Medæus elegans*, Alph. M.-Edw. One of the specimens is infested by a Bopyrid.

Dimensions of the largest specimen (♂):—

Distance between the last antero-lateral teeth . .	millim. 19 $\frac{1}{3}$
Length of the cephalothorax, the basal portion of the abdomen not being included	13

Medæus distinguendus, de Haan, has previously been recorded

from Japan and Hongkong, and it seems to occur also in the Red Sea according to Dr. Heller.

Genus CHLORODIUS, *Rüpp.*

21. CHLORODIUS NIGER, *Forskål.*

Cancer niger, *Forskål., Descriptiones animalium* &c. (Hafniæ, 1775), p. 89.

Chlorodius niger, *Rüppell, Beschreibungen und Abbildungen von 24 Arten kurzschwänzigen Krabben* (Frankfurt, 1830), p. 20, Taf. iv. fig. 7.

Chlorodius niger, *Milne-Edwards, Hist. Nat. Crust. i.* p. 401; *Alph. Milne-Edwards, l. c.* p. 214.

Chlorodius niger, *Stimpson, l. c.* p. 31; *Heller, l. c.* p. 18.

Cancer (Xantho) denticulatus, *de Haan, Herklots, Symbolæ carcinologicae* (Leyden, 1861), p. 10.

Chlorodius niger, *de Man, Notes from the Leyden Museum*, vol. ii. p. 174.

Six specimens of different sizes were collected at Elphinstone Island, an adult female and five younger specimens.

The cephalothorax of the adult individual is 23 millim. broad and 15 millim. long. The specimens all belong to that variety in which the two posterior antero-lateral teeth are acute, spiniform, and obliquely directed forward; the two anterior antero-lateral lobes and the external orbital angles are rounded. The anterior margin of the arms of the chelipedes is armed with a small acute tooth, and the upper margin is somewhat granular.

This species seems to be distributed throughout the whole Indo-Pacific region, having been recorded from the Red Sea (Tor, Djeddah), the Seychelles, Zanzibar, Madagascar, Mauritius, Madras, Nicobar Islands, the Malayan archipelago (Java, Timor, Halmahera), the coasts of Australia (Port Jackson, Darnley Island), New Guinea, New Caledonia, and the Pacific Ocean (Fiji, Loo-Choo, and Samoa Islands) as far as Tahiti.

22. CHLORODIUS SCULPTUS, *Alph. M.-Edw.*

Chlorodius sculptus, *Alph. Milne-Edwards, Nouv. Arch. du Muséum Hist. Nat. t. ix.* p. 217, pl. viii. fig. 4; *de Man, Notes from the Leyden Museum*, vol. iii. p. 98.

Three fine specimens (2♂, 1♀) were collected at Sullivan Island.

The cephalothorax of the largest individual is 15½ millim. long and 25 millim. broad. As in *Chlorodius niger*, so also in this species, the form of the antero-lateral teeth is variable

In two specimens only the last antero-lateral tooth on each side is spiniform; and this probably has also been the case in the third example, but unfortunately in it these teeth seem to be broken off. In the specimens from New Caledonia, described by M. Alph. Milne-Edwards, the last two antero-lateral teeth were spiniform. Not only is the anterior margin of the arms of the chelipedes armed with more or less acute tubercles, but some are also present on the upper margin. The ambulatory legs are densely covered, along their upper margins, with long yellowish hairs and, as in the Red-Sea specimen described by me some time ago, the upper margin of the meropodites is spinulose and not granulose, as stated by Alph. Milne-Edwards.

Chlorodius sculptus, a very distinct species, has previously been found in the Red Sea (*de Man*), on the shores of the Seychelles, the Samoa Islands, and New Caledonia.

Genus LEPTODIUS, *A. M.-Edw.*

23. LEPTODIUS EXARATUS, *M.-Edw.*

Chlorodius exaratus, *Milne-Edwards, Hist. Nat. Crustacés*, t. i. p. 240; *Stimpson, l. c.* p. 31.

Cancer (*Xantho*) *affinis*, *de Haan, Fauna Japonica*, p. 48, pl. xiii. fig. 8.

Leptodius exaratus, *Alph. Milne-Edwards, l. c.* p. 222.

Leptodius exaratus, *Kossmann, Zoolog. Ergebnisse einer Reise in die Küstengebiete des rothen Meeres*, 1877, p. 32, Taf. ii.

Twenty-five rather young specimens of this widely distributed species are in the Collection; all belong to the typical *L. exaratus*, *M.-Edw.* Thirteen were collected at Elphinstone Island Bay (7 ♂, 6 ♀), six at Owen Island (3 ♂, 3 ♀), and six at King Island Bay. One of the Elphinstone-Island female specimens is infested with a *Sacculina*.

24. LEPTODIUS NUDIPES, *Dana.*

Chlorodius nudipes, *Dana, United States Explor. Exped., Crust.* t. i. p. 209, pl. xi. fig. 12.

Leptodius nudipes, *Alph. Milne-Edwards, Nouv. Arch. du Muséum Hist. Nat.* t. ix. p. 225.

Two specimens (♂ ♀) were collected at Owen Island. The cephalothorax of the larger specimen, the male, is 16½ millim. broad; whereas the female individual, which is already carrying eggs, is scarcely 10 millim. broad. According to *Milne-Edwards*, this species, however, attains a breadth of 20 millim.

I have only to add to the quoted descriptions that the posterior half of the upper surface of the cephalothorax is also punctate, so that the whole upper surface is punctate. This species presents a singular resemblance to *Xantho nudipes*, Alph. M.-Edw. (*l. c.* p. 197, pl. vii. fig. 5). In this latter form, however, which has the fingers of the chelipedes pointed and not at all excavated, the distance of the orbits measures only a *third* of the breadth of the carapace, whereas in *Leptodius nudipes* the cephalothorax is *scarcely twice* as broad as the distance of the orbits.

Leptodius nudipes, Dana, has been recorded from the Strait of Balabac, New Caledonia, New Zealand, and the Sandwich Islands.

25. *LEPTODIUS CAVIPES*, Dana.

Chlorodius cavipes, Dana, *l. c. t. i.* p. 212, pl. xii. fig. 1; *Stimpson*, *l. c.* p. 32.

Three specimens (1 ♂, 2 ♀) of this rare species were collected at Owen Island. They agree perfectly with the original description and with the figure quoted.

The cephalothorax of the largest specimen (♂) is 12 millim. broad, and the smaller female, which is already provided with eggs, is only 10 millim. broad. According to Dana, however, this species attains a breadth of more than 10 lines.

The rare *Leptodius cavipes* has hitherto been recorded, so far as I know, only by Dana and by Stimpson from the Bonin Islands.

26. *LEPTODIUS*, sp.

The Collection contains two very young specimens, namely, a male individual found at Elphinstone Island, and a female from Owen Island, which are closely allied to *Leptodius exaratus*, but which differ from that common species by the hands being covered with small granules. The cephalothorax of the male specimen is scarcely 9 millim. broad, that of the other scarcely 10 millim. As regards the shape of the carapace, these examples resemble very well *Leptodius exaratus*, the antero-lateral margins being armed with four teeth, but the upper surface is somewhat minutely granular anteriorly. The chelipedes of the male are unequal, those of the female almost equal; the granules, with which the outer surface of the hands is provided, are more distinct in the male than in the female. I do not venture to give a new name to these specimens, especially as this granula-

tion may hereafter prove to be a character of very young individuals, similar to what occurs in young specimens of *Eriphia levimana*. Perhaps these specimens belong to Haswell's *Lepidodius granulatus* (Proc. Linn. Soc. N. S. W. vol. vi.), but his description is not at my disposal.

Genus CHLORODOPSIS, A. M.-Edw.

27. CHLORODOPSIS PILUMNOIDES, Ad. & White.

Chlorodius pilumnoides, Adams and White, *Zoology of the Voyage of H.M.S. 'Samarang,'* 1850, *Crustacea*, p. 41, tab. ix. fig. 3.

Seven specimens were collected at Owen Island, viz. two very young males and five females; two of the latter are adults. They fully agree with the original description and figure. In the adult females the anterior margin of the arms of the chelipedes is armed with a row of four or five strong spines. The species may easily be distinguished by this character from the closely allied *Chlorodopsis melanochira*, A. M.-Edw., from New Caledonia. In the females the black coloration of the fingers does not extend on the outer or inner surface of the palm, whereas in the adult male it does do so according to Mr. Miers. In the young specimens the anterior margin of the arm is still nearly unarmed, only presenting one or two small acute tubercles at the proximal end; the anterior margin of the front and the orbits are also less spinulose in these young individuals.

Chlorodopsis pilumnoides has hitherto only been recorded from Singapore and the Philippine Islands.

Genus CYMO, de Haan.

28. CYMO ANDREOSSYI, Aud.

Pilumnus Andreossyi, Savigny, *Description de l'Egypte, Crust.* p. 86, pl. v. fig. 5.

Cymo Andreossyi, Heller, *Sitzungsber. k. Akad. Wiss. Wien*, 1861, p. 346.

Cymo Andreossyi, Heller, *Crustaceen der Novara-Reise*, 1865, p. 20.

Cymo melanodactylus, de Haan, *Fauna Japonica, Crust.* p. 22.

Cymo Andreossyi, Miers, *Report Zool. Collections of the Voyage of H.M.S. 'Alert,'* 1884, p. 532.

A male specimen is in the collection from Sullivan Island, and it perfectly agrees with a specimen collected at Djeddah, in the Red Sea. It is only 10 millim. broad, whereas the

breadth of the Djeddah specimen is $13\frac{1}{2}$ millim. The individual from Sullivan Island belongs to the variety *melanodactyla*, the fingers being dark-coloured with white tips. The right leg is largest. The frontal margin is armed between the dentiform internal orbital angles, on each side of the median furrow, with five small acute teeth: the first, third, and fifth are of equal size, the second and fourth a little smaller; the first or median teeth are a little more prominent than the others.

Cymo Androssyi, with the variety *melanodactyla*, is distributed throughout the Red Sea, the Indian Ocean, the Malayan archipelago, as far as the Fiji and Samoa Islands.

GENUS MENIPPE, de Haan.

29. MENIPPE RUMPHII, Fabr.

(Compared with a typical specimen of Fabricius's *Cancer Rumphii*.)

Cancer Rumphii, Fabricius, *Supplementum Entom. Syst.* p. 336.

Cancer Rumphii, Herbst, *Krabben und Krebse*, iii. p. 63, Taf. xlix. fig. 2.

Pseudocarcinus Belangeri, Milne-Edwards, *Hist. Nat. des Crustacés*, t. i. p. 409, pl. xiv. bis, fig. 25.

Menippe Belangeri, Heller, *Crustaceen der Novara-Reise*, p. 15.

Nec Pseudocarcinus Rumphii, Milne-Edwards, l. c. p. 408.

Three rather young specimens were collected at King Island. I am indebted to Dr. F. Meinert of Copenhagen for an excellent photograph of the typical specimen of Fabricius's *Cancer Rumphii*, collected by Daldorff on the coast of Tranquebar. After having compared these specimens with that figure, I was led to the conclusion that they belong to *Menippe Rumphii*, Fabr. I then sent one of them to Dr. Hilgendorf, who informed me that it was also identical with Herbst's *Cancer Rumphii*. As had already been proved in 1872 by Prof. von Martens, I am also inclined to regard Milne-Edwards's *Pseudocarcinus Belangeri* as identical with the true *Menippe Rumphii*, Fabr., whereas *Pseudocarcinus Rumphii*, M.-Edw., is doubtless a different species.

I have before me an adult male specimen of *Menippe Rumphii*, Fabr., collected on the coast of Atjeh, and I may now add the following particulars to the existing descriptions of this species.

Menippe Rumphii, Fabr., really belongs to the genus *Menippe*, because the peduncle of the external antennæ occupies the

internal hiatus of the orbits, the inferior margin of which is not united with the upper margin; the basal joint is rather small, the second scarcely reaches the front, and the third joint occupies the orbital hiatus, though not filling it. As in *Myomenippe*, the flagellum of these antennæ is rather short, being only as long as the breadth of the front.

The cephalothorax is rather enlarged, the proportion of its length to its breadth (the distance of the penultimate antero-lateral teeth) being, as Heller rightly observes, as 43 to 63. The upper surface is slightly convex longitudinally, being rather declivous towards the front and towards the antero-lateral margins; the posterior half is rather flattened and much depressed. The interregional grooves are very shallow, and some of them are scarcely or not at all indicated; besides the usual median frontal furrow, shallow gastro-branchial and branchio-cardiac grooves are present, the latter being, however, very faintly marked in young individuals. The transverse groove (cervical suture), which in other species separates the gastric region from the cardiac, is wanting. On each side of the gastric region, a faintly marked, arcuate sutural line is found, the inner end of which terminates in the middle of the gastro-branchial groove; whereas the postero-external end issues into a short impressed line, which proceeds obliquely inward and backward from the last antero-lateral tooth. The same grooves are found also in *Myomenippe granulosa*, A. M.-Edw., in which they are very deep; they are, on the contrary, very shallow and often scarcely distinct in *Menippe Rumphii*, Fabr. In *Myom. granulosa* the regions are very prominent and covered with granules, while in *Men. Rumphii* they are only partly indicated and smooth. Though the upper surface is smooth and glabrous, it is, however, punctate, especially on the antero-lateral portions and on the gastric region; the punctations are generally minute, but some larger ones are scattered over the hepatic region, on the proto-gastric lobes, and on the arcuate sutural line, which occurs on each side of the gastric region.

The slightly prominent front is rather narrow, the distance of the internal angles of the upper orbital margins measuring scarcely more than one fifth of the greatest width of the cephalothorax. The front presents four obtuse rounded lobes; the internal lobes are broad and rounded, and nearly twice as broad as the external, which are much smaller, much less prominent,

dentiform and obtuse. The internal lobes are separated from one another by a rather deep triangular incision, the internal from the external by a shallower emargination. The smaller, external, frontal lobes finally are separated from the obtuse, little prominent, internal angles of the upper orbital margins by an equally shallow emargination. Whereas in *Myom. granulosa*, A. M.-Edw., the front is armed with six lobes, the four lateral ones of which are dentiform, the front of *Men. Rumphii* only presents four lobes, of which the internal are nearly twice as broad as the external, as I have already observed. Immediately behind the median or internal frontal lobes, two rounded tubercles or prominences are seen on the front, between the internal orbital angles, one behind each median frontal lobe; a little more backwards the two rounded epigastric lobes are found, which are ovate, rounded, and as prominent as the two lobes that lie before them on the front. Immediately behind the epigastric lobes, the four protogastric lobes are observed, which are, however, very faintly marked, the grooves which separate the internal from the external being scarcely indicated. All these lobes are separated from one another by the median frontal furrow, which is distinctly marked. The orbits are small and round, and their upper margin presents traces of two fissures. The external angle of the orbits is very small, obtuse, and scarcely prominent; as in *Myom. granulosa*, A. M.-Edw., it is separated by a small hiatus from a somewhat larger, obtuse tubercle, which lies immediately below it, on the inferior orbital margin, which is somewhat more prominent. The internal lobe of the inferior orbital margin is rounded and obtuse, and projects comparatively less forward than in *Myom. granulosa*, being less prominent than the external frontal teeth.

The antero-lateral margins, which are almost as long as the postero-lateral, present four lobes behind the external angles of the orbits, the two posterior of which are dentiform and slightly prominent; the two anterior, however, are broad, scarcely prominent, and obscure. They are separated from one another by rather small, shallow notches; quite different from the prominent antero-lateral lobes of *Myom. granulosa*, which are separated from one another by deep incisions. The greatest width of the cephalothorax is at the penultimate antero-lateral teeth. The postero-lateral margins are oblique and straight.

The endostome is not ridged longitudinally. The pterygosto-

mian regions and the inflected sides of the carapace are smooth; the latter are hairy on the posterior half, above the bases of the legs. As regards the shape and structure of the outer foot-jaws, this species fully agrees with *Myom. granulosa*.

The anterior legs greatly resemble those of *Myom. granulosa*, but they are everywhere completely smooth, though sparsely punctate. They are as unequal as in that species, the right leg in all the specimens being largest. The upper margin of the arm, which is fringed with short hairs, does *not* present a small acute spine at its distal end. The internal angle of the wrist is slightly prominent, rounded and obtuse. The larger hand is but little shorter than the greatest width of the cephalothorax and about twice as long as high. In the shape of the palm and of the fingers, and in the armature of the latter, this species closely resembles *Myom. granulosa*. The ambulatory legs of both species are very similar to one another, the three terminal joints being rather hairy.

Dimensions of a large male specimen:—

	millim.
Length of the cephalothorax.....	40
Greatest width of the cephalothorax	58
Distance of the internal angles of the upper orbital margins	12 $\frac{3}{4}$
Length of the larger hand	54
Height of the larger hand.....	25

Menippe Rumphii, Fabr., inhabits the Bay of Bengal and the neighbouring seas, being recorded by Fabricius from the coast of Tranquebar, and by Heller (as *Menippe Belangeri*) from the Nicobar Islands, whereas the above described specimen was collected by Mr. J. A. Kruyt on the coast of Atjeh (Sumatra).

Genus MYOMENIPPE, *Hilgendorf*.

The genera *Menippe* and *Myomenippe* stand greatly in need of revision, much confusion being still found in the synonymy of their species. The genus *Myomenippe* chiefly differs from *Menippe* by the external antennæ being quite excluded from the orbits, the inferior margin of which is united with the upper margin, as in the genus *Euruppellia*, Miers.

30. *MYOMENIPPE GRANULOSA*, A. M.-Edw. (Pl. II. fig. 1.)

Menippe granulosa, Alph. Milne-Edwards, *Descriptions de quelques espèces nouvelles de Crustacés Brachyures*, Ann. Soc. Entomol. de France, vii. 1867, p. 275.

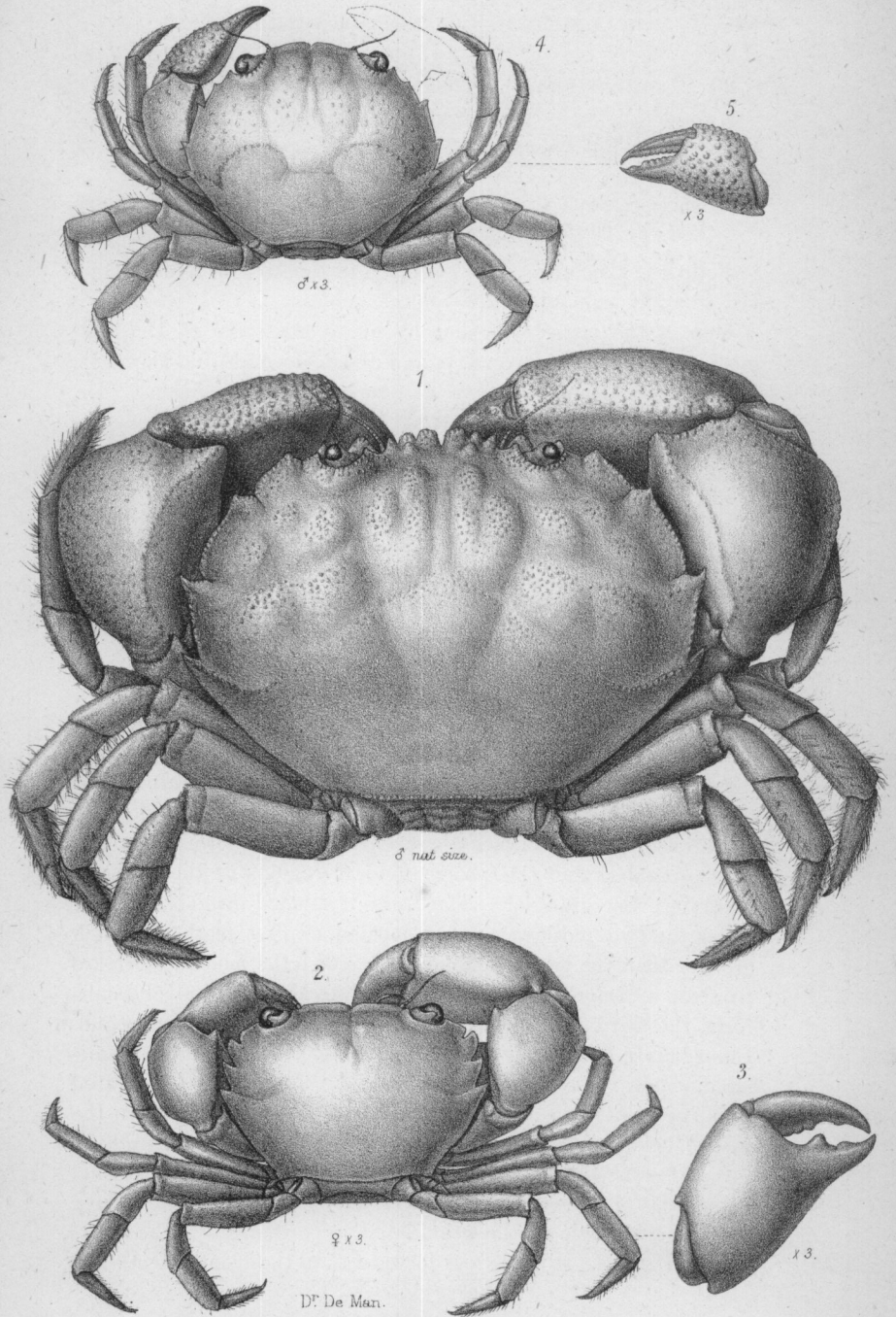
Myomenippe duplicidens, Hilgendorf, *Monatsb. k. Akad. Wiss. Berlin*, Nov. 1878, p. 796 (footnote).

Four fine specimens were collected in the Mergui Archipelago, viz. an adult male and three younger males.

One of the latter was sent by me successively to Dr. Hilgendorf, of Berlin University, and to Prof. A. Milne-Edwards, in order to attain accuracy in naming these specimens. Dr. Hilgendorf informed me that it belonged to his *Myomenippe duplicidens*, whereas Prof. Milne-Edwards stated that it was a representative of his *Menippe granulosa*. The latter name has the priority, as it was established eleven years before the former. Dr. Hilgendorf moreover mentioned to me the characters by which this species may be distinguished from *Menippe Panope*, Herbst, which is a true *Menippe*, and from *Menippe Rumphii*, Fabr., which is identical with *Menippe Belangeri*, M.-Edw.

As *Myomenippe granulosa*, A. M.-Edw. (= *duplicidens*, Hilg.), is still insufficiently known, I will describe the largest specimen.

The upper surface of the cephalothorax is rather convex, and the regions are very distinctly indicated, being separated from one another by rather deep interregional grooves. The elevated parts of the upper surface are covered with numerous very distinct granules, and the postero-lateral regions of the cephalothorax are also granular. The front is divided into six teeth, of which the two, most prominent, median or first teeth are much broader than the two lateral of each side; the median teeth are truncate anteriorly, whereas the two lateral teeth are tuberculiform, the third tooth being even a little smaller than the second. Immediately behind the second teeth, and on each side, a granulated, small, rounded tubercle is found. The front is separated from the orbits by a fissure, which is broader and deeper than the fissure between the second and third frontal teeth; behind the former fissure the terminal joint of the peduncle of the external antennæ is visible—that is, perfectly excluded from the orbits. The internal angle of the granulated upper margin of the orbits is rather obtuse, extends less forward than the frontal teeth and



1 MYOMENIPPE GRANULOSA. 2, 3 ACTUMNUS NUDUS.

4, 5. EURYCARCINUS MACULATUS.

Berjeau & Highley lith.

Mintern imp.

than the large rounded internal lobe of the infraorbital margin, which even extends a little more forward than the third frontal teeth, though less than the second. The external angle of the upper orbital margin is small and less prominent than the external angle of the under margin, from which it is separated by a small hiatus. The internal infraorbital lobe is united in this species with the obtuse internal angle of the upper margin, so that the orbits are perfectly closed internally, a character which even distinguishes the genus *Myomenippe*. This character is already present in the youngest specimen, which is only 22 millim. broad. According to Hilgendorf, the orbits of young specimens of *Myomenippe Fornasinii*, 12 millim. broad, are also already closed internally, precisely as in the adult. The lateral margins of the cephalothorax are armed with four teeth, besides the small external orbital angle; these teeth are separated from one another by rather deep incisions, and their margins are minutely granulated. The first is triangular and acute, and its external margin is slightly emarginate. The second, the largest of all, is almost twice as long as the first, and its external margin is nearly straight. The third and fourth teeth are more acute than the two preceding; the third tooth is shorter than the second, but a little longer than the first, and it is directed straightly forwards, the external margins of both third teeth scarcely converging backwards. The fourth or last antero-lateral tooth is directed obliquely outwards and forwards.

The chelipedes of the male are a little unequal, the right being the larger in all these specimens. The arms project scarcely beyond the lateral margins of the cephalothorax. The upper margin of the arms terminates quite at the distal end in a small acute spine, which may easily be overlooked. The wrist presents an acute, prominent, dentiform, internal angle slightly curved upwards; the upper surface of the wrist is granular anteriorly outwards and along the inner margin, the granules being less distinct on the middle of the upper surface; in the younger specimens the whole upper surface is more or less granular. In the adult male the length of the larger hand measures nearly three fourths of the breadth of the cephalothorax; the hand is quite smooth on its outer and inner surfaces, and also on its under margin, but it is granular on and near the rounded upper margin, and some granules are also observed on

the outer surface close to the articulation with the wrist. The mobile finger is granular at the base of its upper margin; its inner margin is armed with five or six teeth, the two basal being a little larger than the others. The immobile finger is armed with a large tooth, that occupies the basal half of the inner margin, and with two much smaller teeth. In the smaller (left) hand the outer surface of the palm is a little more granulated than that of the right, the outer surface being also granular towards the base of the immobile finger and even a little towards the under margin; the mobile finger is armed much in the same manner as in the other hand, but the immobile finger presents six teeth, of which the fourth is much larger than the others, though not so large as the large tooth of the index of the right hand; the first, second, and sixth teeth are very small.

In the younger individuals the hands are more granulate than in the adult. In a broad specimen, 39 millim., the whole outer surface of the smaller hand is still granular, and the outer surface of the larger hand is also nearly wholly granular. In the smallest specimen, which is only 22 millim. broad, the hands are everywhere granular on their whole outer surface.

As regards the ambulatory legs, which are hairy, especially on the last two joints, I will only remark that the first two pairs have nearly the same length, that the third pair is somewhat shorter, and that the legs of the last pair are the shortest of all.

Dimensions of the adult specimen and of a younger one :—

	millim.	millim.
Length of the cephalothorax	50	28
Breadth of the cephalothorax (distance between the third or penultimate lateral teeth)	71	39
Distance between the external orbital angles	33	20½
Length of the larger hand	54	28

Myomenippe granulosa, A. M.-Edw., has hitherto been recorded from the coast of Batavia (*Milne-Edwards*) and from the seas of Celebes (*Hilgendorf*); this species therefore inhabits the Malayan archipelago and the neighbouring seas.

As regards *Menippe granulosa*, Strahl (*Archiv f. Naturg.* xxvii. p. 105, 1861), Prof. v. Martens has shown that this species is identical with *Menippe Panope*, Herbst, after an examination of both the typical specimens.

I am indebted to Dr. Hilgendorf for the following information regarding *Cancer Panope*, Herbst, which really belongs to the genus *Menippe*, the orbits not being closed internally. The typical specimen of Herbst's *Cancer Panope* is $19\frac{1}{2}$ millim. broad and $14\frac{3}{4}$ millim. long. In this species the granules, which are found on the middle of the outer surface of the hands, are larger than those of the upper and under margins of the palm, as they have a diameter of $\frac{1}{2}$ millim., whereas in *Myomenippe granulosa*, A. M.-Edw., the largest granules are found on the upper margin. In *Menippe Panope* the front is *not* divided into six teeth, and the postero-lateral regions of the cephalothorax are nearly quite smooth behind the last antero-lateral tooth, whereas they are distinctly granular in *Myomenippe granulosa*, A. M.-Edw. The lobes on the upper surface of the carapace are less distinct in *Menippe Panope*, being even less developed than in Herbst's figure. The course or direction of the last antero-lateral tooth and the form of the posterior margin of the cephalothorax are also somewhat different in both species.

Genus EURYCARCINUS, *Alph. M.-Edw.*

There can be little doubt that the small crustacean described by Alph. Milne-Edwards as a second representative of his genus *Pilumnopeus* must be referred to *Eurycarcinus*. *Pilumnopeus maculatus*, indeed, perfectly agrees, in its outer appearance and in its essential characters, with the true representatives of *Eurycarcinus*, viz. *E. natalensis*, Krauss, *E. Grandidieri*, A. M.-Edw., *E. orientalis*, A. M.-Edw., and *E. integrifrons*, d. M.*; so that there is no reason to refer it to a distinct genus.

The small group of Crustaceans which bears the name of *Eurycarcinus* is, in my opinion, a very natural one. It belongs to those forms the palate of which is more or less distinctly divided by a ridge defining the margin of the efferent canal, such as *Ozius*, *Epixanthus*, *Heteropanope*, and *Pilumnus*; but it is distinguished by its outer physiognomy—the enlarged cephalothorax, which is very convex longitudinally, the transverse orbits,

* I will here remark that *Eurycarcinus integrifrons*, which I described some years ago (Notes from the Leyden Museum, i. p. 55), may perhaps prove to be identical with *Eurycarcinus orientalis*, very shortly described by A. Milne-Edwards from specimens obtained at Bombay (Annal. Soc. Entom. France, 1867, p. 277).

the little prominent antero-lateral teeth, the seven-jointed abdomen of the male, &c.

31. EURYCARCINUS MACULATUS, *A. M.-Edw.* (Pl. II. figs. 4 & 5.)

Pilumnopeus maculatus, *A. Milne-Edwards, Descriptions de quelques espèces nouv. de Crustacés Brachyures, Annal. Soc. Entom. France*, vii. 1867, p. 277; and *Crustacés de Zanzibar et de Madagascar, Nouv. Arch. du Muséum Hist. Nat.* t. iv. p. 82, pl. xix. figs. 17-19.

A single male specimen was collected at Elphinstone Island.

The cephalothorax of this little species is 8 millim. long and $12\frac{1}{3}$ millim. broad, very convex longitudinally and transversely; the upper surface is glabrous, smooth, though minutely punctate on the cardiac region and the surrounding parts of the middle of the carapace, and minutely granular on the frontal and antero-lateral regions. These minute points and granules, however, are only visible with a magnifying-glass, so that the upper surface appears smooth and shining to the unaided eye. Some inter-regional grooves are very faintly indicated, while the others are entirely absent: thus a faint longitudinal median groove is observed on the anterior part of the carapace which separates the two scarcely distinct epigastric lobes; the transverse groove between the gastric and cardiac regions is also feeble, whilst a curved minutely granular line occurs on each side of the carapace, proceeding from the last antero-lateral tooth obliquely forward, as indicated in the figure in the 'Archives.'

The front is not at all prominent but a little deflexed, and its straight anterior margin presents only a small narrow median incision and a very small, scarcely distinct sinus on each side near the lateral angles (internal orbital angles). The upper margin of the orbits is unarmed and presents no fissures; but the under margin presents a triangular hiatus near the external orbital angle, and is armed in the middle with a series of four or five small conical granules, between which some smaller ones occur; the under orbital margin also appears to be a little hairy. The antero-lateral margins of the carapace are much shorter than the straight postero-lateral ones; they are armed with four teeth, including the external orbital angles. The first tooth, the outer angle of the orbits, is broadly truncate; the second is a little narrower, but likewise rather obtuse; while the third and the fourth teeth are acute and directed obliquely forward. (In

Eurygarcinus natalensis, Krauss, and *E. Grandidieri*, A. M.-Edw., the second lateral tooth is the largest of all, and in *E. integrifrons*, d. M., the two anterior antero-lateral teeth are of equal size.) The subhepatic region is minutely granular and hairy. The endostome is faintly ridged on each side. The sternum of the male is minutely punctate when seen under a magnifying-glass, and the postabdomen is seven-jointed.

The chelipedes are very unequal in size, and in this specimen the right is the largest. As in the case of the ambulatory legs, they seem to agree in all respects with those of the Zanzibar specimens described by Milne-Edwards. The ambulatory legs are provided along their upper and under margins with some hairs, few in number on the meropodites, but more numerous and dense on the two terminal joints, which moreover bear a close down; and finally the carpopodites of the chelipedes are armed with a small rather acute tubercle at their internal angle. As in specimens from Zanzibar, the outer surface of the hands is marked with numerous small red spots.

This very rare species has hitherto been known only from the shores of Zanzibar.

Genus OZIUS, H. M.-Edw.

32. OZIUS TUBERCULOSUS, H. M.-Edw.

Ozius tuberculosus, Milne-Edwards, *Hist. Nat. Crustacés*, t. i. p. 405.

Ozius tuberculosus, Alph. Milne-Edwards, *Nouv. Arch. du Muséum Hist. Nat.* t. ix. p. 238, pl. xi. fig. 2; Heller, *Crustaceen der Novara-Reise*, p. 23.

One fine female specimen was collected at Sullivan Island. It has the cephalothorax 57 millim. broad and 41 millim. long.

Ozius tuberculosus had been previously recorded from the Mauritius, the Nicobar Islands, and New Caledonia.

Genus EPIXANTHUS, Heller.

Although scarcely generically distinct from *Ozius*, the genus *Epixanthus* may be retained for those species the cephalothorax of which is more enlarged, more depressed and flattened, and in which the fingers of the smaller chelipede are very slender and in contact with one another over their whole length. The genus is represented in the Indo-Pacific region as well as on the shores of West Africa. The former region is inhabited by *Epixanthus frontalis*, M.-Edw., *E. dentatus*, White, and *E. cor-*

rosus, A. M.-Edw.; and the latter by *Epixanthus Hellerii*, a species described also by Prof. A. Milne-Edwards. I may point out that in *E. dentatus* the inferior margin of the orbits presents a distinct hiatus near the external orbital angle, whereas in *E. frontalis* scarcely a trace of it is found.

33. *EPIXANTHUS FRONTALIS*, *H. M.-Edw.*

Ozius frontalis, *Milne-Edwards, Hist. Nat. des Crustacés*, t. i. p. 406.

Epixanthus frontalis, *Heller, Crustaceen der Novara-Reise*, p. 20; *Alph. Milne-Edwards, l. c.* p. 241.

Nine specimens are in the collection, five (1 ♂, 4 ♀) from King Island, three from Sullivan Island, and one from Elphinstone Bay. In all the right hand is the largest.

Epixanthus frontalis has been observed in the Red Sea (*Kossmann*), in the Persian Gulf, Karak Island (*Heller*), at Zanzibar (*Hilgendorf*), the coast of Tranquebar (*Milne-Edwards*), the Nicobar Islands (*Heller*), the China seas, Japan (*Stimpson*), and New Caledonia (*A. Milne-Edwards*); it would therefore appear to be distributed throughout the whole Indo-Pacific Ocean.

34. *EPIXANTHUS DENTATUS*, *White.*

Panopæus dentatus, *White, Proc. Zool. Soc.* 1847, p. 226; *Adams and White, Zoology H.M.S. 'Samarang,' Crustacea*, p. 41, pl. xi. fig. 1.

Epixanthus dilatatus, *de Man, Notes from the Leyden Museum*, vol. i. p. 58.

Panopæus acutidens, *Haswell, A Catalogue of the Australian Stalk-and Sessile-eyed Crustacea*, p. 51, pl. i. fig. 2.

Epixanthus dentatus, *Miers, On Malaysian Crustacea, Ann. and Mag. Nat. Hist.* 1880, 5th ser. vol. v. p. 233.

Four specimens were collected at Elphinstone Island. There can be little doubt that Haswell's *P. acutidens* is identical with the species described by White.

Epixanthus dentatus has been collected on the coast of Java, at the Philippine Islands, and on the coast of Australia (Port Darwin).

Genus *ACTUMNUS*, *Dana.*

This genus is described as having the fingers of the chelipedes spoon-shaped. In the species represented in this Collection the fingers have pointed tips—a fact already pointed out by Prof. A. Milne-Edwards in the case of one of them (*Nouv. Arch.* t. ix. p. 194).

35. *ACTUMNUS SETIFER*, *de Haan*.

Cancer (*Pilumnus*) *setifer*, *de Haan*, *Fauna Japonica*, *Crustacea*, p. 50, pl. iii. fig. 3.

Actumnus tomentosus, *Dana*, *l. c. t. i.* p. 243, pl. xiv. fig. 2.

Actumnus setifer, *Alph. Milne-Edwards*, *Nouv. Arch. du Muséum Hist. Nat. t. i.* p. 287, pl. xviii. fig. 5.

Actumnus tomentosus, *Alph. Milne-Edwards*, *l. c.* p. 285, and *Nouv. Arch. Mus. Hist. Nat. t. ix.* p. 194.

Actumnus setifer, *Miers*, *Report on the Zoological Collections made during the Voyage of H.M.S. 'Alert,' Crustacea*, pp. 225 & 226.

A small male specimen, which I refer to this species, was collected in the Mergui Archipelago.

The antero-lateral margins are armed with three small spiniform teeth behind the scarcely prominent, though acute external orbital angle, and some small acute granules occur between these spiniform teeth. The lobes of the upper surface of the cephalothorax are very distinct and covered with small acute granules anteriorly and on the antero-lateral regions, those of the hepatic region being the largest and most prominent. The specimen has lost one chelipede. In the preserved chelipede, the outer and upper surface of the hand is covered with many acute granules, which even occur at the base of the index; the mobile finger is covered with some acute granules at its base. The fingers appear to be smooth and their tips are pointed; the index is provided with a small tuft of hair on its outer and on its inner surfaces, near the dentiferous margin. The outer surface of the hand is rather convex, whilst the inner surface is nearly plain and almost perfectly smooth, which is also characteristic of the inner surface of the fingers.

Actumnus setifer has been recorded from Japan, Tahiti, and New Caledonia.

36. *ACTUMNUS ELEGANS*, *n. sp.*

Of this new species, seven specimens (5 ♂, 2 ♀) were collected at Sullivan Island. It is most closely allied to *Actumnus obesus*, *Dana*, from the Sandwich Islands, which evidently represents this form in the Mergui Archipelago.

It may be distinguished at first sight from *A. obesus* by the antero-lateral margins being armed with six acute spinuliform granules, behind the acute granuliform external angle of the orbits, arranged in three groups, two together.

The cephalothorax has precisely the same form as that of *Actumnus obesus*, and is uniformly covered on its upper surface with short yellow hairs. The regions are quite indistinct, no trace of divisional lines being found; the upper surface is *not* uniformly covered with granules as in *A. obesus*, but only a few acute granules (15-20) are found on the antero-lateral regions, which resemble the six granules with which the antero-lateral margins are armed, but are much smaller. The front, the gastric, cardiac, and intestinal regions are not covered with granules. The frontal margin is divided by a small median incision in two almost straight lobes, and passes laterally continuously into the upper orbital margin, not being separated by a cleft from the internal orbital angles. The frontal or inner part of the upper margin of the orbits makes nearly right angles both with the frontal and the external, somewhat granular portion of the upper orbital margin. The external angle of the orbits is formed by a small, acute, spinuliform granule. The antero-lateral margins are about as long as the postero-lateral, which are smooth and concave; they are armed with six small, acute, spinuliform granules, which are arranged in three groups, two in each. The inferior margin of the orbits is minutely granular, and presents a small triangular hiatus close to the external orbital angle. The pterygostomial regions are glabrous and nearly quite smooth, presenting only some minute granules near the inferior margin of the orbits. The outer surface of the maxillipeds, the sternum, and the lateral margins of the abdomen are clothed with yellow hairs.

The chelipedes are of unequal size, the right chelipede being the larger in all our specimens. The anterior margin of the arm, which is very short, the antero-internal margin of the wrist, and the upper margin of the hand and of the mobile finger are clothed with a row of long yellow hairs. The upper surface of the wrist and the outer surface of the larger hand are covered with similar yellow hairs, disposed between the granules with which they are provided. The larger hand wholly resembles that of *A. obesus*, its outer surface being covered everywhere with acute granules, disposed irregularly, those of the middle of the outer surface being a little larger than those of the upper; the under margin presents a longitudinal line of granules on the inner side, and is clothed with a row of long yellow hairs. The

mobile finger is somewhat hairy and granular at the base, though much less than in *A. obesus*, the granules not extending beyond the proximal half of the finger. The outer surface of the fingers, the tips of which are pointed, is smooth. The inner surface of the hand is smooth, being only a little punctate at the base of the mobile finger. The smaller chelipede presents the same characters as the other.

The ambulatory legs are precisely similar to those of *A. obesus*, being clothed with rather long yellow hairs, but they are somewhat granular; the upper margin of the meropodites is minutely granular, and somewhat larger acute granules are observed on the upper surface of the carpopodites and propodites.

The cephalothorax of the largest specimen, a female, is $5\frac{3}{4}$ millim. broad; and the species probably attains a larger size.

37. *ACTUMNUS NUDUS*, *A. M.-Edw.* (Pl. II. figs. 2 & 3.)

Actumnus nudus, *Alph. Milne-Edwards, Descript. de quelques espèces nouvelles de Crustacés Brachyures, Annal. Soc. Entom. de France*, 4^e sér. t. vii. 1867, p. 265.

A single female specimen was collected in the Mergui seas. Prof. Milne-Edwards kindly identified it for me, and as his determination is doubtless correct, I now add a full description of the species.

The specimen is nearly twice as large as that described by Milne-Edwards. The cephalothorax is rather narrow, the proportion of the breadth to the length being as 4 to 3. The upper surface is very convex longitudinally, and also somewhat declivous towards the lateral margins. Interregional grooves are almost wholly wanting: I only observe a faintly indicated, shallow, cervical suture, separating the gastric region from the hepatic and branchial regions, and the usual shallow, median, frontal furrow, bifurcated behind, which separates the slightly prominent epigastric lobes from one another. The front, the epigastric lobes, the gastric region, and especially the antero-lateral regions are covered with pearl-shaped granules; on each side of the gastric region, ten or twelve of these granules are arranged in an arcuate line, with the convexity directed forward, which separates the antero-lateral region from the postero-lateral. Each antero-lateral region (hepatic and epibranchial) is

covered with 30-35 perliform granules; the granules of the gastric region are not so numerous and a little less prominent, and a few small granules are observed immediately behind and close to the arcuate line of granules which I have described above. When the upper surface is examined with a sufficiently strong magnifying-glass it appears covered everywhere, anteriorly as well as posteriorly, with innumerable microscopic granules. A few short hairs are also sparsely distributed over the anterior half of the cephalothorax. The front, which is strongly deflected, measures about a third of the breadth of the cephalothorax. It is much advanced and divided by a small median, triangular incision into two rounded oblique lobes, the anterior margins of which are somewhat crenulate or uneven, and nearly continuous with the upper orbital margins, being separated from the internal angles of the orbits by a small and scarcely distinct cleft. The upper margin of the orbits is entire and covered with minute pearl-shaped granules, and the external angle of the orbits is very little prominent. The entire inferior margin of the orbits presents, close to the external angle, and separated from it by a narrow fissure or hiatus, a dentiform lobe which projects a little more forward than the external angle of the orbit itself. The internal lobe of the inferior orbital margin is dentiform and obtuse. The internal orbital hiatus is occupied by the peduncle of the external antennæ, the penultimate joint of which nearly reaches the front. The antero-lateral margins of the upper surface of the cephalothorax are scarcely longer than the postero-lateral, and are divided into five, little prominent, broad (=long) dentiform lobes, including the scarcely prominent external orbital angle. The third or middle lobe is the broadest (or longest) of all, the second and the fourth are a little broader (or longer) than the first (external angle of the orbits), the fourth being rather acute, and the last antero-lateral tooth is dentiform and also rather acute. The two last antero-lateral teeth are slightly carinate above, the carinæ being minutely granular; the granular carina of the fifth tooth is directed backward and slightly inward, and terminates at the postero-external end of the curved line of granules, which defines the antero-lateral from the postero-lateral regions, as is described above.

The inflected sides of the carapace, as the pterygostomian, subhepatic, and subbranchial regions, are nearly quite smooth; the

under surface of the internal lobe of the inferior orbital margin is, however, somewhat granular, and the posterior end of the subhepatic region, which is situated below the two last anterolateral teeth, is also slightly granular. The anterior part of the subhepatic regions and the pterygostomian regions are glabrous, but the posterior half of the inflected sides of the cephalothorax are a little hairy. The endostome is distinctly longitudinally ridged on each side.

The specimen has unfortunately lost its larger chelipede, so that I can only describe the smaller one, the left. The arm is almost wholly covered by the cephalothorax, and its outer surface is smooth, the upper margin being a little hairy. The convex upper surface of the wrist is covered with some pearl-shaped granules, which are similar to those of the anterior part of the upper surface of the carapace. The distal end of the internal margin of the wrist is somewhat dentiform, and the internal surface of this joint is smooth.

The outer surface of the palm, as well as its upper and under margin, is covered with numerous, small, scarcely acute granules which are arranged irregularly, but the convex inner surface of the palm is smooth. The brownish-coloured fingers are a little shorter than the palm. They have pointed, crossing tips. The inner edges meet along their whole length; the inner edge of the immobile finger is distinctly crenulate, but the same edge of the mobile finger appears entire and is only very minutely crenulate. The outer surface of the immobile finger is longitudinally grooved and slightly granular; the mobile finger is also longitudinally sulcate on its upper margin and outer surface, and covered with granules between the grooves, the granules decreasing gradually in size towards the pointed tip.

The ambulatory legs are short, and, when compared with those of other species of this genus, tolerably slender. Their outer surface is smooth, but the upper margin of the joints, especially of the carpopodites and propodites, is minutely granular, and all the joints are slightly hairy along their upper and under margins. The dactylopodites are scarcely longer than the propodites, and terminate in rather long, acute, scarcely arcuate, corneous tips.

Dimensions of the specimen under notice :—

	millim.
Breadth of the cephalothorax (distance between the fourth or penultimate antero-lateral teeth)	11 $\frac{3}{4}$
Length of the cephalothorax	8 $\frac{3}{4}$
Breadth of the front	4

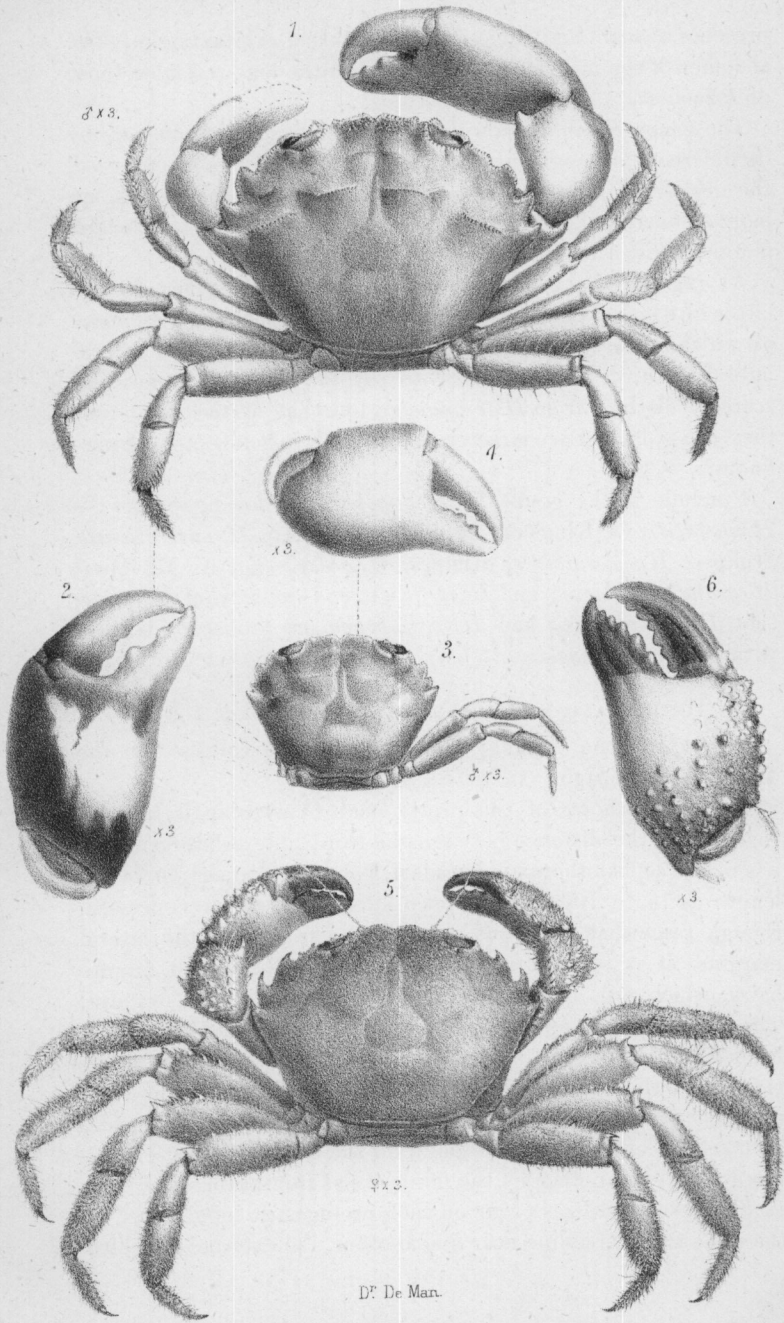
Actumnus nudus was discovered in 1867 at Pondicherry, but has not been recorded since, so far as I am aware.

Milne-Edwards's specimen had evidently lost the hairs with which the legs had been sparsely clothed.

GENUS HETEROPANOPE, Stimpson.

The name *Heteropanope*, established by Stimpson in 1858, being of older date than the name *Pilumnopeus* of A. Milne-Edwards, I propose to include under the former a small number of Crustaceans from the Indo-Pacific region, which were described by Stimpson as representatives of *Heteropanope*, together with a few species described by A. Milne-Edwards, Miers, and Haswell under the name of *Pilumnopeus*. I may, however, remark that Stimpson also referred to his genus *Heteropanope* those species which are regarded as representatives of the genus *Epixanthus*. As regards the genus *Pilumnopeus*, two species have been described by the French carcinologist under that name, one of which, *Pilumnopeus maculatus*, is a true *Eurycarcinus*; whereas the second, named *Pilumnopeus crassimanus*, is probably identical with *Ozius serratifrons*, Kinahan, and also perhaps with Stimpson's *Heteropanope australiensis* (Miers, *Zoology of the Voyage of H.M.S. 'Alert,' Crustacea*, p. 228). I am the more inclined to retain the genus *Heteropanope*, because, when the genus *Pilumnus* is submitted to a thorough revision, it may be useful to refer to the former some species which still bear the name of *Pilumnus*.

The glabrous or scarcely hairy cephalothorax of most species of *Heteropanope* is little convex (except that of *H. serratifrons*) and but little enlarged; the lateral margins are armed with four or five more or less prominent teeth, which are never spiniform, and the front is more or less prominent. The external antennæ resemble those of *Pilumnus*, the basal joint being small and not nearly reaching the front. The endostome is longitudinally ridged. The inferior margin of the orbits, which are transverse,



1, 2. HETEROPANOPE INDICA. 3, 4. H. EUCRATOIDES.
 Crowther lith. 5, 6. PILUMNUS ANDERSONI. Mintern imp.

presents a small hiatus close to the external orbital angle. The abdomen of the male is seven-jointed, and the legs resemble those of *Pilumnus*.

The genus *Epixanthus* is distinguished from *Heteropanope* by its different physiognomy—the cephalothorax is more enlarged, the orbits are circular, the hands, and especially the fingers, are more slender, and the basal joint of the external antennæ, which is united with the front, is large.

As regards the genera *Eurycarcinus* and *Pilumnus*, in the latter of which I propose to include those species the carapace of which is more or less hairy and armed with spiniform antero-lateral teeth, it is unnecessary to say that they are generically scarcely distinct from *Heteropanope*, but that at the same time they are sufficiently characterized by their whole outer physiognomy.

I include in the genus *Heteropanope* the following species:—*H. serratifrons*, Kinahan; *H. glabra*, Stimps.; *H. australiensis*, Stimps.; *H. eueratoides*, Stimps.; *H. crassimana*, A. M.-Edw.; *H. granulosa*, Miers; and *H. indica*, n. sp.,—observing, however, that *H. australiensis* and *H. crassimana* are probably identical with *H. serratifrons*.

38. HETEROPANOPE INDICA, n. sp. (Pl. III. figs. 1 & 2.)

Two specimens, a male and a female, were collected in the Mergui Archipelago.

The cephalothorax of this pretty small Crustacean is broader than long; the distance between the third antero-lateral teeth, where the cephalothorax is broadest, being in proportion to the length as 15 to 10½. The upper surface is rather depressed, though somewhat declivous towards the front and the lateral margins; it is covered with a few, sparsely distributed, minute hairs, which are, however, scarcely visible to the naked eye. The regions of the upper surface are faintly marked by shallow inter-regional grooves. The upper surface is smooth posteriorly; on the anterior half it is marked with some transverse, minutely granulated, pubescent, elevated lines, five on each side. Two small elevated lines are found on the epigastric lobes, separated from one another by the faint mesial frontal furrow. Two other transverse ridges occur on each protogastric lobe, placed in the same transverse line near one another, the external of which

is only half as broad as the internal ridge. Lastly, two parallel, slightly oblique, elevated lines are seen near the third and the fourth antero-lateral teeth, the posterior of which is twice as broad as the anterior. Although I have described the upper surface as being smooth, I may, however, remark that it is minutely granular near the postero-lateral margins, which are but little longer than the antero-lateral. The distance between the third antero-lateral teeth is three times as great as the distance between the internal orbital angles. The front is somewhat declivous, and consists of two slightly oblique lobes, which are separated from one another by a small triangular incision; these lobes are rather prominent in the middle, and their minutely granular anterior margin is broadly emarginate towards the external angle, so as to constitute a small tooth at the external angle of each lobe. Each frontal lobe is marked above with a slightly arcuate, transverse, granular line, and is covered with some granules between this line and the anterior margin. The frontal lobes, which therefore somewhat resemble those of some species of *Leptodius*, are separated by a small notch from the little prominent, internal orbital angles. The orbits are transverse, being a little broader than long. The granular upper margin of the orbits is marked with two fissures on the external half; the granulated or minutely denticulated under margin presents a strong, rather obtuse, tooth at the internal angle, which is a little more prominent than the internal angle of the upper margin, projecting nearly as much forward as the small external teeth of the frontal lobes. The infraorbital margin is marked with a small triangular hiatus close to the little prominent external angle of the orbits.

The antero-lateral margins are armed with four prominent teeth, including the external orbital angle. The first tooth is rather broad, and its external margin is slightly emarginate; the second tooth much resembles the first, but it is a little narrower and more triangular; the third tooth is the most prominent of all, being triangular, rather acute, and directed obliquely forward; the fourth tooth resembles the third, but is much smaller and much less prominent. The last two teeth are somewhat carinate and granular above, and the external margins of all the antero-lateral teeth are granular.

The inflected sides of the cephalothorax are somewhat granular and hairy, but the pterygostomial regions do not present a

tubercular eminence, as in *H. serratifrons*, or a small tooth, as in *H. australiensis*. The basal joint of the external antennæ is short and small, and does not nearly reach the front; the other joints occupy the internal orbital hiatus, and the flagellum is rather short, measuring only a fourth of the distance between the third antero-lateral teeth. The endostome is distinctly longitudinally ridged on each side. The epistome is nearly smooth. The male abdomen is seven-jointed, the joints being all distinctly separated from one another; it closely resembles that of some *Pilumnii*, and the penultimate joint is nearly quadrate, being scarcely broader than long. The sternum and the abdomen are smooth, though somewhat pubescent, and the lateral margins of the female abdomen are fringed with rather long hairs.

The chelipedes are very unequal, the right being the largest in both specimens; although the larger chelipede of the female specimen is wanting, I suppose that the anterior legs present the same size both in the male and in the female. The arms are short, scarcely projecting laterally beyond the lateral margins of the cephalothorax; they are armed near the distal end of the upper margin with a strong, acute, somewhat curved tooth. The under margin is entire, but the anterior margin is somewhat granular and hairy. The external (or posterior) surface of the arm is minutely granular near the upper margin, but otherwise the arms appear smooth. The wrist is armed with a small, scarcely acute tooth at the distal and internal angle; its upper surface appears smooth to the naked eye, but, when seen under a lens, some small granules are observed near the internal and external margins, especially on the wrist of the smaller chelipede. The larger hand is very large, its length (the fingers included) being but little shorter than the breadth of the cephalothorax, *i. e.* the distance between the third antero-lateral teeth. The fingers are nearly half as long as the palm, which is but little longer than broad (high). The outer surface of the palm is rather convex and quite smooth, and the obtuse upper and under margins, like the inner surface, are also perfectly smooth. The fingers have pointed tips, which cross one another; they are nearly smooth, the immobile finger presenting only a trace of a longitudinal impressed line on its outer and inner surfaces, and the mobile finger being slightly granular above at the articulation. The latter presents a somewhat larger tooth at its base, and the other finger is armed with

two or three teeth along its inner margin. Whereas the larger hand is quite smooth and glabrous, the upper and under margins and the outer surface of the palm of the much smaller left hand are covered with distinct granules and with sparsely distributed hairs. In the smaller hand the fingers also are comparatively longer than in the larger hand, being but little shorter than the palm; they are distinctly longitudinally sulcate, but are only indistinctly denticulate. The mobile finger is somewhat granular and hairy above near the articulation with the palm.

Regarding the ambulatory legs, I may remark that the three anterior pairs have nearly the same length, but that the last pair are distinctly shorter. They are somewhat hairy, especially the last three joints. The dactylopodites are almost as long as the propodites, and terminate in small horny tips.

Dimensions of the male specimen :—

	millim.
Length of the cephalothorax	10½
Breadth of the cephalothorax (distance between the third antero-lateral teeth)	15
Distance between the internal orbital angles	5
Length of the larger hand (fingers included)	14
Length of the palm	9
Height of the palm near the articulation with the fingers	7

39. HETEROPANOPE EUCRATOIDES, *Stimps.* (Pl. III. figs. 3 & 4.)

Heteropanope eucratoides, *Stimpson, Proceed. Acad. Nat. Sciences Philadelphia*, 1858, p. 33.

A single male specimen of this rare species was found at Elphinstone Island.

This species is closely allied to the preceding, but it presents a different external appearance, on account of the antero-lateral margins being comparatively much shorter in proportion to the postero-lateral, and because the third antero-lateral tooth is not the largest but the smallest of all, so that the cephalothorax is broadest at the fourth antero-lateral teeth.

As in *Heteropanope indica*, the upper surface of the cephalothorax is rather depressed and scarcely convex, being only somewhat declivous towards the anterior and lateral margins. The cephalothorax, however, is a little less enlarged, the proportion

of its breadth (*i. e.* the distance between the fourth antero-lateral teeth) to the length being as $12\frac{1}{2}$ to 9. As regards the structure of the upper surface of the cephalothorax, this species nearly completely agrees with *H. indica*, the anterior half presenting the same minutely granulated transverse elevated lines, in the same number, and arranged in the same manner; the inter-regional grooves, however, are a little more distinct, and the metabranchial regions, which are situated on each side of the cardiac region, are minutely granular. In the form of the front and in their orbits, both species closely resemble each other, so that one description suffices for both; but the anterior margin of the frontal lobes in this species is widely and more faintly emarginate, so that the external angles are much less prominent and not dentiform as in *H. indica*. The antero-lateral margins are comparatively much shorter than those of *H. indica*, so that a transverse line, uniting the fourth antero-lateral teeth divides the upper surface into two portions of very different length, the length of the anterior portion being in proportion to that of the posterior as 1 to 2. The antero-lateral margins are divided into four prominent teeth, including the external orbital angles. The first or anterior tooth is rather small, and much resembles the first antero-lateral tooth of *H. indica*, the external margin being slightly emarginate. The second tooth is a little broader than the first, more prominent and rather obtuse; the third is the smallest of all, triangular, and much less prominent than the second and the fourth. The last tooth is conical and prominent, granulated above and moderately acute. The margins of the teeth are almost smooth. The inflected sides of the cephalothorax are nearly smooth, and only a little granular near the antero-lateral teeth; they do not present the tubercular eminence or tooth which is so characteristic of *H. serratifrons* and *H. australiensis*.

The outer antennæ, the smooth epistome, and the anterior margin of the buccal cavity fully agree with *H. indica*. As in the latter, the endostome is distinctly ridged on each side. The external maxillipeds closely resemble those of *H. indica*; Stimpson's words, "Hectognathopoda sat hiantia," are therefore inexplicable to me, seeing that the external maxillipeds of the species of *Heteropanope* perfectly resemble those of *Pilumnus*. The male abdomen is similar to that of *H. indica*, but the terminal joint is comparatively a little longer. The sternum and abdomen

are minutely pubescent posteriorly. Unfortunately the specimen has lost its smaller chelipede. The chelipede which is present perfectly resembles the larger chelipede of *H. indica*, so that I again refer to my description of that species. I will only add that the chelipede is quite smooth everywhere on all the joints, and that the denticulate upper margin of the arm is furnished near its distal end with a strong tooth, which is, however, a little less acute than in the preceding species.

The ambulatory legs are also wanting, except those of the two anterior pairs of the right side; these agree with those of *H. indica*, but the dactylopodites are a little more elongate, being distinctly longer than the propodites.

Dimensions.

	millim.
Length of the cephalothorax	9
Breadth of the cephalothorax (distance between the fourth antero-lateral teeth)	$12\frac{1}{5}$
Distance between the internal orbital angles	$4\frac{2}{3}$
Length of the hand (the fingers included)	10
Height of the hand at the base of the fingers	$5\frac{3}{5}$

The specimen under description, as in fact the whole collection, is preserved in alcohol. This species is, like *H. indica*, of a dark olive-green colour. The diagnosis given by Stimpson very well agrees with my description, except that the three posterior antero-lateral teeth are described as being acute, whereas in this specimen the second is rather obtuse.

Stimpson discovered this species at Hongkong.

Genus PILUMNUS, *Leach*.

40. PILUMNUS VESPERTILIO, *Fabr.*

Cancer vespertilio, *Fabricius, Suppl. Entom.* 1798, p. 338.

Pilumnus vespertilio, *Milne-Edwards, Hist. Nat. Crustacés*, t. i. p. 418, and *Règne Animal de Cuvier*, pl. xiv. fig. 3.

Pilumnus vespertilio, *Alph. Milne-Edwards, Nouv. Arch. du Muséum Hist. Nat.* t. ix. p. 242; *Hilgendorf, Monatsber. k. Akad. Wiss. Berlin*, Nov. 1878, p. 793; *Miers, Ann. & Mag. Nat. Hist.* 1880, 5th ser. vol. v. p. 234; *Haswell, Catalogue &c.* p. 65.

Eight specimens were collected at Elphinstone Island, five males and three females.

These specimens agree very well with the description and figure given by Milne-Edwards, but I may add the following details.

In all the eight specimens the upper margin of the orbits is more or less granular, and presents *two* fissures, so that this species belongs to the subgenus *Eupilumnus*, established by Kossman (Mr. Miers, *l. c.*, erroneously mentioned the subgenus *sensu stricto Pilumnus*). In all the under margin of the larger hand is covered with rounded granules, except in the two largest males, in which the granulation of the under surface of the larger hand gradually begins to disappear. According to Dr. Hilgendorf (*l. c.*), in the true *P. vespertilio* the under surface of the larger hand is somewhat granular in the male but everywhere granular in the female, so that there can be no doubt that these specimens are really representatives of this species.

Pilumnus ursulus, Ad. & White, and *Pilumnus mus*, Dana, are identical with this species, according to Mr. Miers.

Pilumnus vespertilio is a very common species, distributed throughout the whole Indo-Pacific region, having been observed in the Red Sea (*Kossmann*), at Mozambique (*Hilgendorf*), Java (*Miers*), Sydney (*Hess*), and on the coral-reefs of Australia (*Haswell*), at New Caledonia, the Loo-Choo Islands, and Japan (*Stimpson*).

41. *PILUMNUS ANDERSONI*, n. sp. (Pl. III. figs. 5 & 6.)

Four specimens (1 ♂, 3 ♀) of this new species were collected by Prof. Anderson in the Mergui Archipelago, two of which were found at Elphinstone Island and two at King Island. One of the female specimens is provided with eggs and another is infested in its cephalothorax with a *Bopyrus*. Courage, indeed, is necessary to describe a new species of this genus, for the very numerous species of *Pilumnus*, which often closely resemble one another, are rather insufficiently known. I therefore sent a specimen to Prof. Milne-Edwards, who informed me that this species was unknown to him, although closely allied to *Pilumnus Peronii*, M.-Edw., as I also supposed. As regards the species which have been described by Stimpson, Hilgendorf, Miers, and Haswell, I may remark that *P. Andersoni* is allied to *P. hirsutus*, Stimps., *P. longicornis*, Hilg., *P. Bleekeri*, Miers, *P. terræ-reginæ*, Hasw., and *P. vestitus*, Hasw., but is nevertheless a distinct species in my opinion.

The following is the description of the largest specimen, a female, found at Elphinstone Island.

In its outer appearance *P. Andersoni* somewhat resembles the common Indian *P. vespertilio*, Fabr., but it is of smaller size and much less hairy. The cephalothorax is about once and a half as broad as long, the proportion of the breadth to the length being as 25 to 18. The upper surface is tolerably convex longitudinally, and much less convex transversely; it is much declivous anteriorly towards the front, and also somewhat towards the lateral margins. The regions are faintly and only partly indicated, the inter-regional grooves, so far as they are present, being rather shallow. The two small, rounded, epigastric lobes, which are separated as usual from one another by the median frontal furrow, are a little prominent; the frontal furrow is bifurcated immediately behind them, and the two parallel grooves into which it is divided, which border the mesogastric area, diverge backwards and terminate in the gastrobranchial grooves. The latter are very shallow though yet distinct; their external transverse portions, separating the hepatic and epibranchial regions from one another, are a little deeper than the median portion, and the upper orbital margins are surrounded by a shallow groove which separates these margins from the hepatic and protogastric regions. Behind the cervical suture no other divisional lines are visible. The upper surface of the cephalothorax is covered with some very small granules anteriorly and on the postero-lateral margins: the front, the epigastric lobes, the protogastric regions, and the mesogastric area are covered with minute granules, whereas the granules of the slightly prominent hepatic region and of the anterior margin of the epibranchial region are a little larger. The granules are nevertheless scarcely visible to the naked eye. As I have already observed, some small granules are also found on the postero-lateral margins, but the rest of the upper surface is not granular behind the cervical suture. The upper surface is everywhere minutely punctate and covered with a short down, which conceals the minute granulation of the anterior half.

The front measures a third of the breadth of the cephalothorax, and is considerably deflexed and slightly prominent; as in *P. vespertilio*, it is divided by a triangular median incision into two broad, rather truncate, and slightly oblique lobes, with minutely granulated anterior margins, external to which a small

acute tooth is present on each side, which is separated from the median lobes and from the obtuse, slightly granular, internal orbital angles on each side by a small cleft. The orbits have the usual size and form; the upper orbital margin presents two fissures by which it is divided into three portions, the two external of which are covered with a few granules, whereas the much larger internal portion is almost smooth.

The external orbital angle is little prominent, and not spiniform; it is separated by a small hiatus from the inferior orbital angle, which is denticulate, being armed with six or seven acute teeth besides the also denticulate internal lobe, which projects as much forward as the external frontal teeth. The antero-lateral margins are shorter than the postero-lateral; they are armed, behind the little prominent external orbital angle, with three acute, dark-pointed, spiniform teeth. The external margin of the first antero-lateral tooth, *i. e.* the outer orbital angle, is minutely denticulate, and the external margin of the second antero-lateral tooth, which is spiniform, is also somewhat granular at its base. The external margins of the two posterior antero-lateral teeth are quite smooth. A subhepatic spine which occurs in so many species of this genus is wanting in *P. Andersoni*, its place being occupied by a small, somewhat prominent, acute granule. The postero-lateral margins are straight and very slightly concave. The posterior margin of the carapace is bordered by an impressed line, running close to and parallel with it. The external antennæ are long, measuring twice the distance of the internal and external angles of the orbits, and they reach almost to the penultimate antero-lateral spine. When the cephalothorax is viewed from above, the antennal peduncle is visible in the cleft or hiatus that separates the internal orbital angles from the external frontal teeth; its basal joint, which scarcely reaches a process of the external frontal tooth, is twice as long and nearly twice as broad as the next or penultimate joint. The terminal joint projects beyond the front, and is scarcely shorter than the second joint.

The subhepatic and pterygostomial regions of the carapace are covered with a short down and with numerous minute granules; those which are found on the anterior portion of the subhepatic region are a little larger than the others. The endostome is distinctly longitudinally ridged. The anterior margin of the epistome is granular, the posterior margin, *i. e.* the anterior margin of the buccal cavity, is sharp, and similar to that of

P. vespertilio. The outer foot-jaws also resemble those of that species; they are covered with a short pubescence and fringed with yellow hairs along their inner margins. The sternum and the abdomen are covered with a short down, the abdomen, both in the male and in the female, being similar to that of *P. vespertilio*. The abdomen of the female is fringed with long hairs on the lateral margins.

The chelipedes are very unequal: in three specimens the right hand is the largest, in the fourth it is the left. The anterior margin of the basipodites is armed with three or four acute granules. The arms scarcely project beyond the lateral margins of the cephalothorax; the upper margin is armed with two somewhat arcuate, dark-pointed, acute spines at the distal end, the larger of which is situated a little behind the distal spine, which is itself accompanied by a somewhat smaller spine at its base. Behind these large spines the upper margin is further armed with four or five acute granules, which gradually decrease in size towards the proximal end. The anterior margin of the arm presents three or four acute teeth along its proximal half, and the under margin is also granulo-spinulous. The under surface of the basipodites and of the arms is a little granular; the concave inner and the scarcely convex outer surfaces are a little punctate but nearly smooth, the outer surface being only slightly granular near its margins. The wrist is armed, at its internal angle, with an acute spine, and the upper surface is granulo-spinulous, being covered with many small acute tubercles or granules, especially along the inner margin and anteriorly (distally). In its outer appearance the larger hand is similar to that of *P. vespertilio*. The larger hand is nearly twice as long as high (at the base of the fingers), the fingers being included, and quite as long as the length of the cephalothorax. The convex outer surface of the palm is more or less granulo-spinulous on the upper margin and on a proximal area; around the articulation of the wrist, the distal portion of the palm, and the rounded under margin are quite smooth and glabrous. As already remarked, the size of the granulo-spinulous area of the outer surface of the palm is a little variable, the smooth portion of the outer surface being in some specimens larger than in others. In one of the specimens from King Island, the whole under margin of the palm is smooth, and the granules are even wanting at the distal end of the upper margin, so that the granulo-spinulous area only

occupies the proximal third of the outer surface. In the largest specimen, on the contrary, the larger proximal half of the outer surface is granulo-spinulose, and some granules are also found at the proximal end of the under margin. The granules of the granulo-spinulose area are of unequal size and are acute; some larger granules are often observed in two rows on the upper margin, and irregularly spread over the outer surface, whereas others of smaller size are distributed between the large granules. In other specimens the granules which are found on the upper margin are smaller than those of the outer surface. The somewhat convex inner surface of the palm is quite smooth in the three smaller specimens, but a little granular on the middle in the largest. The dark-coloured fingers are shorter than the palm, and are nearly similar to those of *P. vespertilio*; they meet along their inner margins, and have pointed, crossed tips. The mobile finger is covered above at its base with a few granules, but otherwise it is quite smooth and glabrous, presenting, however, some longitudinal lines of punctulations. The inner edge is feebly denticulate, a somewhat larger (longer) tooth being found at the base, and the inner surface bears a few small tufts of short hairs along the inner edge. The immobile finger presents an impressed, punctate, longitudinal line on the outer and on the inner surface; its inner margin is provided with six teeth, which are stronger than those of the mobile finger, and the third of which is the largest; on the inner surface this finger also bears a few tufts of short hairs.

The hand of the smaller chelipede is much smaller and comparatively more slender than the larger hand. The smaller hand is a little shorter than the other, but much lower, its height measuring scarcely more than a third of the length, the fingers included. The whole upper surface of the palm, including its upper and under margins, is covered with some large acute granules, which are comparatively a little larger than those of the larger hand, and are mostly arranged in six or seven longitudinal rows, two of which are found on the upper margin. The inner surface of the palm presents some acute granules. The fingers of the smaller hand, which are shorter than the palm, meet along their inner margins, and have also pointed crossed tips. The lower finger is slightly deflexed, and rather profoundly sulcate both on its outer and its inner surface; the inner margin is armed with five or six teeth. The mobile finger, which is

a little granular and hairy above at the base, is also profoundly sulcate, and, as in the larger hand, its inner edge is more feebly denticulate than the lower finger. Both fingers present a few small tufts of short hairs internally along the inner edges.

The ambulatory legs resemble those of the European *P. hirtellus*, and are tolerably slender. The upper margins of the meropodites are armed with some acute spinules along their distal half, one of which is constantly found at the distal end; the other joints are unarmed. The dactylopodites are straight, a little shorter than the propodites, and terminate in an acute, slightly arcuate, horny tip.

The anterior legs are everywhere covered with a short pubescence, except the smooth distal portion of the outer surface of the larger hand, which is quite glabrous; the inner surface of the palms and the fingers are also glabrous and naked. The ambulatory legs present everywhere the same pubescence, and are fringed moreover along their upper and under margins with rather long hairs, especially along those of the last three joints.

Dimensions of the largest specimen:—

	millim.
Length of the cephalothorax	13 $\frac{1}{2}$
Breadth of the cephalothorax, the lateral spines included	18 $\frac{3}{4}$
Distance between the internal orbital angles	6 $\frac{3}{4}$
Length of the larger hand	13 $\frac{1}{2}$
Height of the larger hand at the base of the fingers . .	6 $\frac{1}{2}$
Length of the smaller hand	10 $\frac{3}{4}$
Height of the smaller hand	4 $\frac{1}{5}$
Length of the ambulatory legs of the penultimate pair .	32

The female bearing eggs is 15 millim. broad.

According to Prof. Milne-Edwards, this new species differs from *Pilumnus Peronii*, M.-Edw., by a less globular cephalothorax, the upper surface of which is more granular, by a less advanced front, and by more pointed and more delicate anterolateral spines.

P. cursor, A. M.-Edw., from New Caledonia and Upolu, is also closely allied to our species. In *P. cursor*, however, a typical specimen of which I have before me, the inter-regional grooves are more distinctly indicated, the whole outer surface of the larger hand is covered with granules, and the fingers of the larger hand are profoundly sulcate, at least in the typical specimen, which

TREASURER'S ACCOUNT for the year from May 1, 1886, to April 30, 1887. (Presented at the Anniversary Meeting, Tuesday, May 24, 1887.)

Receipts and Payments.

<i>Receipts.</i>		<i>Payments.</i>	
£	s. d.	£	s. d.
Balance at Bankers' on 1st May, 1886.....	381 12 9	Taxes and Insurance	22 13 9
Interest on Investments	190 14 0	Repairs and Furniture	38 0 10
Admission Fees	288 0 0	Coals and Gas	69 5 0
Annual Contributions	1260 3 0	Salaries and Commission	431 13 4
Compositions	180 0 0	Library:—	
Sales of Publications:—		Books	£140 6 5
Transactions	£145 16 7	Binding	82 8 2
Journals	116 10 10		222 14 7
Proceedings and Catalogues.....	3 1 6	Expenses of Publications:—	
Donation	265 8 11	Printing.....	£583 15 6
	113 10 2	Illustrations	631 5 5
		Distribution	68 7 4
			1283 8 3
		Miscellaneous Printing and Stationery	65 14 0
		Petty expenses (including Tea and Postage).....	74 10 4
		Investment	150 0 0
		Balance at Bankers on 30th April, 1887.....	321 8 9
			£2679 8 10

Investments on 30th April, 1887.

	£	s.	d.
Consols	3511	19	0
Metropolitan Board of Works 3½ per cent. Stock	1184	15	11
Great Indian Peninsula Railway 5 per cent. Guaranteed Stock	938	14	0
Do. Do. 4 per cent. Debenture Stock	108	0	0
Forth Bridge Railway Co. 4 per cent. Stock	495	0	0
	£6238	8	11

FRANK CRISP, *Treasurer.*

The foregoing accounts have been examined and found correct. {
 FRED V. DICKINS, ALBERT D. MICHAEL, } *Auditors.*
 WILLIAM CARRUTHERS, B. DAYDON JACKSON, }
 May 12, 1887.

NOTICE.

THE irregularity in the issue of Numbers of the Journals in sequence is due to separate Volumes being issued concurrently.

Journal of Zoology.

Vol. XX., when completed, will contain **Nos. 116 to 125** inclusive.

Of this Volume there has been published Nos. 116, 117, and 118.

Vol. XXI.—Devoted to the Fauna of the Mergui Archipelago, when completed, will contain **Nos. 126 to 135** inclusive.

Of this Volume there has been published Nos. 126, 127–128, and 129.

Vol. XXII. will consist only of Dr. De Mau's Crustacea of the Mergui Archipelago, commencing **No. 136**, and this Volume may run to six Parts.

Fellows are requested to compare the Numbers given above with their series, before inquiring as to supposed missing Parts.

For issues of Botany, see notice on back of the wrapper of the Botanical Journals.