REPORT

ON THE

ZOOLOGICAL COLLECTIONS

MADE IN THE

INDO-PACIFIC OCEAN

DURING THE

VOYAGE OF H.M.S. 'ALERT'

1881-2.

LONDON:

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1884.

CRUSTACEA. By E. J. Miers.

Anomura.

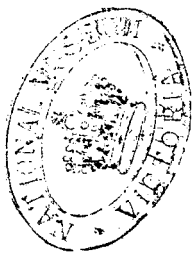
ALCYONARIA. By STUART O. RIDLEY.

SPONGIIDA. By STUART O. RIDLEY.

CRUSTACEA.

BY

E. J. MIERS.



THE Crustacea collected by Dr. R. Coppinger on the north-western, northern, and north-eastern coasts of Australia are very numerous; and are interesting not only on account of the large number of new or rare species obtained, but also on account of the careful manner in which in nearly every instance the nature of the sea-bottom and depth of water &c. was recorded.

Until the publication of Mr. W. A. Haswell's comprehensive work on the Podophthalmious and Edriophthalmious Crustacea of Australia*, but few systematists had dealt specially with this department of the fauna of this district.

To the Australian species enumerated by Milne-Edwards in his great work†, numerous additions were, however, made by Prof. J. D. Dana in the Report on the Crustacea collected by the United States Exploring Expedition under Commodore Wilkes‡, these being, with few exceptions, from the coast of New South Wales.

In 1856 Dr. J. R. Kinahan§ published an account of a small collection of marine Decapoda collected by himself at Port Phillip, Victoria; and in 1865 Dr. Hess‖ gave a systematic account of the then known species of Decapoda of Eastern Australia, based upon the work of previous authors and a collection from Sydney in the Museum of Göttingen.

In the same year appeared the Report by Prof. Camil Heller on the Crustacea collected by the Austrian frigate 'Novara'¶, wherein twenty-four species are enumerated, also from Sydney. Reference may also here be made to an account of the Astacidæ of Australia ("Ueberblick der neuholländischen Flusskrebse") by Dr. von Martens**.

Mr. Haswell's recently published and very useful Catalogue, which was not received until this Report was considerably advanced,

* 'Catalogue of the Australian Stalk- and Sessile-eyed Crustacea.' Sydney, 1882.

† 'Histoire Naturelle des Crustacés' (1834–40).

‡ United States Exploring Expedition, vols. xiii. & xiv., Crustacea (1852–53).

§ Journal of the Royal Dublin Society, vol. i. pt. 3, p. 111 (1856).

‖ Archiv f. Naturgeschichte, xxxi. p. 127 (1865).

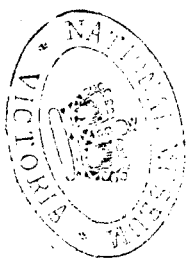
¶ 'Reise der österreichischen Fregatte Novara,' Crustaceen (1865).

** Monatsbericht der Akad. Wissensch. Berlin, p. 615 (1868).

contains not only the results of his own previous researches on the Australian Stalk- and Sessile-eyed Crustacea (which are to be found in a series of papers communicated to the Linnean Society of New South Wales *, wherein a very considerable number of species new to science are described and illustrated), but also gathers into a form convenient for reference nearly all the work of earlier authors—not merely what is contained in the special memoirs referred to above, but also the numerous Australian species described and incidentally noticed in the publications of A. White, Spence Bate, A. Milne-Edwards, and others, or in my own papers.

In this Catalogue no fewer than 540 species of Podophthalmious and Edriophthalmious Crustacea are described; but, large as this number may appear, it is necessarily very far from being a complete enumeration of the Stalk- and Sessile-eyed Crustacea of this great continent, which presents in its different regions such diverse conditions of temperature and climate. This will appear from the large number of species described in the following pages, which are either new to science or not included in the 'Catalogue'; and I may add that, had time and opportunity allowed, it would have been possible to largely add to the list of unrecorded Australian species from the rich material accumulated in the National Collection alone.

In the present memoir 203 species and well-marked varieties of Crustacea and Pycnogonida are enumerated from the Australian seas, besides several which are described or incidentally referred to, but which do not belong to the Australian fauna. Forty-five new or undescribed species and ten varieties are described for the first time; while of the total number (193 in all) of species and varieties of Australian Podophthalmia and Edriophthalmia noticed in the following pages, ninety-six are not included in Mr. Haswell's catalogue. Among the species described as new are several to which White applied specific names but never characterized; these names have been, of course, adopted. Besides the new species, several hitherto very imperfectly known from the existing descriptions (and therefore only to be identified with some uncertainty) have been redescribed and illustrated.



Geographical Distribution.—As regards the geographical range of the species, I have not thought it necessary (nor, indeed, would it be possible within the limits of this Report) to give all the hitherto recorded localities, many of them being common and widely-ranging Oriental forms which occur (or may occur) on every coast-line within the wide Indo-Pacific or Oriental region. Full particulars, however, are given of the Australian localities, and many are now for the first time recorded on the authority of specimens in the British-Museum collection obtained by the naturalists of H.M.SS. 'Rattlesnake' and 'Herald,' and by the late Messrs. Dring, J. B. Jukes, and other gentlemen, by whose zeal and discrimination our National Collection has so greatly benefited. In the case

* Journal of the Linnean Society of N. S. Wales, iii.–vi. (1879–82).

of the more widely ranging species, I have given (where I have not previously done so) the localities whence the British Museum possess specimens, which will serve to indicate generally with sufficient accuracy the distribution of the species, or, in some cases, the *lacunæ* which yet remain in the series preserved in the National Collection.

With few exceptions, the species were dredged in comparatively shallow water, on which account it is the more remarkable that so many novelties were obtained. Of the species already described, a large proportion (more than one third) are widely distributed throughout the Oriental or Indo-Pacific regions, from the Mascarene Islands (or African coast) on the east, to the Fiji, Samoa, or Sandwich islands on the west, while many others are at present known only from the Indo-Malayan section of this area, ranging probably from the Sea of Bengal to the coasts of China and Japan.

While the littoral and shallow-water Crustacea which are distributed throughout the great Indo-Pacific region are not, *as a general rule*, found beyond the limits of this vast area of distribution, yet there are a certain number which have a far wider range: thus, in the present memoir, *Alpheus edwardsii*, *Alpheus minus*, *Penæus velutinus*, *Gonodactylus chiragra*, and *Caprella æquilibra* are instances of species which are more or less widely distributed throughout the Atlantic region, and it is probable that future research will largely add to the number of such forms. In regard to the Amphipoda the affinity of the Australian with the European fauna is very remarkable; and among the few species included in the present Report instances (*Leucothoë spinicarpa*, *Caprella æquilibra*) occur where I have identified Australian examples with well-known European types, while in several other instances the distinctions are so slight as to be scarcely of specific importance: hence I must qualify the opinion I formerly expressed as to the improbability of the species of such widely distant regions ever being actually identical *.

Appended is a list of the principal localities where the specimens were dredged, with Dr. Coppinger's notes on the depth of water and nature of the sea-bottom; the numbers are those attached to the several bottles containing the dredgings, and are referred to throughout the Report.

List of the Localities.

Port Jackson. 0–5 fms., February and March 1881 (No. 90); 5–7 fms., rock and mud, April 1881 (No. 104).
Port Curtis. 7–11 fms., sand and shells, April 1881 (Nos. 85, 87, 88, 92); beach, April 1881 (No. 96).
Percy Island. 0–5 fms., sand and coral (No. 91).
Port Molle. Beach, sand (No. 95); beach and coral-reef (No. 98); beach between tide-marks (No. 103); 5–12 fms., coral (No. 118); 14 fms., rock (No. 93): all in May 1881.

* Ann. & Mag. Nat. Hist. ser. 5, v. p. 125 (1880), and P. Z. S. p. 62 (1881).

Port Denison. 4 fms., rock and sand, May 1881 (Nos. 111, 122).
Fitzroy Island. 10 fms., mud and shells, 26th May, 1881 (No. 113).
Flinders, Clairmont. 11 fms., sand and mud, May 1881 (No. 108).
Off Clairmont. Coral-reef (No. 151).
Torres Straits. 10 fms., sand (No. 158).
Thursday Island, Torres Straits. Mangrove-swamps, June 1881 (No. 124); land-crabs from holes in the hills, July 1881 (No. 125); beach, June 1881 (No. 167); 3–4 fms., sand, August 1881 (Nos. 145, 175, 177); 4–5 fms., sand, July 1881 (No. 165); 4–6 fms., rock and sand, June 1881 (No. 130).
Friday Island, Torres Straits. Beach, September 1881 (No. 154); 10 fms., sand, October 1881 (No. 153).
Warrior Reef, Torres Straits. Crabs from the interior of pearl-shells, August 1881 (No. 137).
Prince of Wales Channel. 7 fms., sand, September 1881 (Nos. 142, 169); 9 fms., sand, September 1881 (No. 157).
West Island, Prince of Wales Channel. Beach, coral, September 1881 (No. 149).
Arafura Sea, N.W. Australia. 32–36 fms., mud, sand, and shells, October 1881 (No. 160).
Dundas Straits, N. Australia. 17 fms., mud, October 1881 (No. 161).
Port Darwin, N. Australia. Beach, mud and sand, October 1881 (No. 176); 7–12 fms., sand and mud, October 1881 (No. 173).

As will be seen from the foregoing list, the localities where the most abundant opportunities offered for collecting, and where, consequently, the largest number of species were obtained, are Thursday Island in Torres Straits and Ports Curtis and Molle on the Queensland coast; but the dredgings of most scientific interest are unquestionably those made off the north coast in the Arafura Sea, and at Port Darwin and in Dundas Straits, not only on account of the new and rare species therein obtained, but also because these localities had not previously been explored for Crustacea. The dredging in the Arafura Sea was also the only one made in any considerable depth of water (32–36 fms.), the next in point of depth being that at Dundas Straits, 17 fms. (No. 161). The collection was received in two distinct consignments, which are referred to as the "first" and "second" collection.

List of the Species, showing their Geographical Range.

[N.B. The species and varieties of Podophthalmia and Edriophthalmia which are distinguished by an asterisk are those not included in Mr. Haswell's Catalogue. The species placed within brackets are those which do not form part of the collection made by Dr. Coppinger.]

PODOPHTHALMIA.

DECAPODA.

BRACHYURA.

Achæus lacertosus, Stimpson. E. and N. Australia (Dundas Sraits).
*—— *affinis*, sp. n. N., N.E., E., and W. Australia.
Camposcia retusa, Latreille. N., N.E., and W. Australia; Oriental Region.

Oncinopus aranea, De Haan. N. and N.E. Australia; Japan; Mindoro Sea; New Hebrides.
Menœthius monoceros (Latreille). N., N.E., and W. Australia; Oriental Region.
Huenia proteus, De Haan. N. and N.E. Australia; Japan; China; Philippine Islands.
Egeria arachnoides (Rumph.). N. and N.E. Australia; Indian, Malayan, and Chinese seas.
Chorilibinia gracilipes, Miers. N. and N.E. Australia; Papua.
Paramithrax (*Chlorinoides*) *coppingeri*, Haswell. N. and E. Australia; Japan.
*—— (——) *aculeatus*, M.-Edw., var. *armatus*, n. N. and N.E. Australia (Thursday Island to Port Curtis).
Hyastenus diacanthus (De Haan). N., N.E., E., and W. Australia; Philippine Islands, Chinese and Japanese Seas.
—— (*Chorilia*) *oryx*, A. M.-Edwards. N., N.E., and W. Australia; Oriental Region.
*—— (——) *planasius* (Ad. & White). N.E. Australia; Chinese seas.
*—— (——) *convexus*, sp. n. N.E. Australia (Port Molle).
Naxia serpulifera, M.-Edwards. N. and W. Australia.
Schizophrys aspera, M.-Edw. N. Australia; Oriental Region.
[*—— *dama* (Herbst). W. Australia.]
**Pseudomicippa*? *varians*, Miers. N., N.E., and W. Australia.
Micippa thalia (Herbst). N., N.E., and W. Australia; Oriental Region.
*—— *philyra* (Herbst). N., N.E., and W. Australia; Oriental Region.
—— *curtispina*, Haswell. N. and N.E. Australia.
Paramicippa spinosa (Stimpson). E. Australia.
Lambrus longispinus, Miers. N. and N.E. Australia; Shanghai.
*—— *lævicarpus*, Miers. N.W. Australia (Arafura Sea).
—— *longimanus* (Linn.). N. and N.E. Australia; Oriental Region? (Mauritius, Javan Sea, &c.).
—— *nodosus*, Jacq. & Lucas. N., N.E., and W. Australia; New Zealand.
—— *turriger*, White. N. and N.W. Australia; Borneo and Philippine Islands.
—— *hoplonotus* (var. *granulosus*, Miers). N. and N.E. Australia; Ceylon; Philippines; New Caledonia.
—— (*Parthenopoides*) *harpax*, Ad. & White. N. and N.E. Australia; China; Borneo.
Cryptopodia fornicata (Fabr.). N., N.E., and E. Australia; Indian and Malaysian seas; Japan, China.
—— *spatulifrons*, Miers. N., E., and W. Australia.
Gonatonotus pentagonus, Ad. & White. N. and N.E. Australia; Javan sea; Borneo.
Euxanthus huonii (Lucas). N. and N.E. Australia.
[*—— *sculptilis*, Dana. N.E. Australia; Philippines; Fiji Islands.]
*—— *tuberculosus*, sp. n. N. Australia (Thursday Island and Warrior Reef).
**Hypocœlus punctatus*, sp. n. N. Australia (Thursday Island).
Atergatis floridus, Linn. N., N.E., and W. Australia; Oriental Region.
Lophozozymus ephelíticus, Linn. N.W., N.E., and E. Australia; Java; Philippines.
**Galene granulata*, sp. n. N. Australia (Port Darwin).
**Halimède*? *coppingeri*, sp. n. N.W. Australia (Arafura Sea).

**Actæa rüppellii* (Krauss). N. and N.E. Australia; Oriental Region (from Natal to Red Sea and eastward to Norfolk Island?).
**—— areolata*, Dana. N.E. Australia; Sooloo Sea or Balabac Straits.
**Banareia inconspicua*, sp. n. N. Australia (Port Darwin).
**Xantho macgillvrayi*, sp. n. N.E. Australia (Port Molle, Port Curtis).
**Cycloxanthus lineatus*, A. M.-Edwards. N.W. and N. Australia; New Caledonia and Lifu.
**Carpilodes venosus*, M.-Edwards. N.E. Australia; Oriental Region.
Leptodius exaratus (M.-Edwards). N.E. and W. Australia; Oriental Region.
**—— lividus* (De Haan). N.E. Australia; Japan.
Chlorodius niger (Forskål). N., N.E., and E. Australia; Oriental Region.
**Chlorodopsis granulatus* (Stimpson). N. and N.E. Australia (Port Darwin, Port Denison, and Port Molle); Hong Kong; Philippines; Singapore.
Etisus lævimanus, Randall. N.E. and E. Australia; Oriental Region.
Etisodes electra, Herbst. N.E. Australia; Oriental Region.
—— *anaglyptus*, M.-Edw. N.E. Australia; Philippine Islands.
Menippe (*Myomenippe*) *lequilloui*, A. M.-Edw. N.E. and W. Australia (Port Curtis and Swan River); Indian and Indo-Malayan seas.
Pilumnus vespertilio, Fabr. N.W., N., and N.E. to E. Australia; Oriental Region.
**—— pulcher*, sp. n. N. Australia (Islands of Torres Straits).
—— *rufopunctatus*, Stimpson. E. and S. Australia.
—— *lanatus*, Latr. N.E. and E. Australia; Tasmania? East Indies (*Latr.*).
**—— semilanatus*, sp. n. N. and E. Australia (Prince of Wales Channel, Cape Capricorn, Moreton Bay).
**—— seminudus*, sp. n. N. and N.E. Australia (Thursday Island, Port Denison).
—— *cursor*, A. M.-Edwards? N.E. Australia; New Caledonia and Samoa Islands.
**—— labyrinthicus*, sp. n. N. and N.E. Australia (Thursday Island, Port Molle).
—— ? *pugilator*, A. M.-Edwards? N.E. and E. Australia; Loyalty Islands; Lifu.
Actumnus setifer (De Haan). N., N.E., and W. (?) Australia; Oriental Region.
Cryptocœloma fimbriatum (M.-Edwards?). N. and N.E. Australia; Java.
Pilumnopeus serratifrons, Kinahan. E. and S. Australia; New Zealand.
Ozius guttatus (var. *speciosus*, Hilgendorf). N.E. Australia; Oriental Region.
Neptunus pelagicus (Linn.). N., N.E., E., and W. Australia; New Zealand; Oriental Region.
[*—— *armatus*, A. M.-Edwards. W. Australia, Shark Bay.]
**—— (Amphitrite) hastatoides* (Fabricius). N. and N.W. Australia (Friday Island, Arafura Sea); Indian Ocean, Hong Kong, &c.
Achelous granulatus (M.-Edwards). N. and N.E. Australia; Oriental Region.
**—— ——*, var. *unispinosus*, n. N. Australia (Prince of Wales Channel).
**Thalamita admete* (Herbst). N.W., N.E., and E. Australia; Oriental Region.

Thalamita sima, M.-Edwards. N., N.E., and W. Australia; New Zealand; Oriental Region.
[*—— *chaptali*, Audouin. Red Sea; Ceylon.]
—— *stimpsonii*, A. M.-Edwards. N. and N.E. Australia; Malaysian Islands; Sunday Island; New Caledonia.
*—— *crenata*, Rüppell. N. and N.E. Australia (Torres Straits, Port Molle, Percy Island); Oriental Region.
**Goniosoma variegatum* (Fabricius). N. Australia (Port Darwin); S. and E. Asian seas; India to Japan.
*—— *spiniferum*, sp. n. N.E. Australia (Port Molle).
Nectocarcinus integrifrons (Latr.). N.E., E., and S. Australia; Tasmania; Red Sea?; Oceania.
* *Lupocyclus rotundatus*, Ad. & White. N. and N.E. Australia; N. Borneo.
**Kraussia nitida*, Stimpson. N. Australia (Thursday Island); Philippines; Japanese and Chinese seas.
**Telphusa* (*Geotelphusa*) *crassa*?, M.-Edwards. N. Australia (Thursday Island, Cape York); Philippines?
[*—— *leichardtii*, sp. n.? E. Australia.]
Gelasimus signatus, Hess. N.E., E., and W. Australia.
Ocypoda ceratophthalma (Pallas). N. to E. Australia; Oriental Region; St. Christophers (??).
—— *kuhlii*, De Haan. N. and W. Australia; Oriental Region.
**Macrophthalmus punctulatus*, sp. n. E. Australia (Port Jackson).
**Euplax* (*Chænostoma*) *boscii* (Audouin). N.E. Australia (Port Molle); Oriental Region.
**Camptoplax coppingeri*, gen. et sp. n. N. Australia (Prince of Wales Channel).
Pseudorhombila vestita (De Haan), var. *sexdentata* (Haswell)? N.W. Australia (Arafura Sea).
*—— *sulcatifrons* (Stimpson), var. *australiensis*, n. N.E. Australia (Port Molle).
**Ceratoplax arcuata*, sp. n. N. Australia (Port Darwin).
*——? *lævis*, sp. n. N.W. Australia (Arafura Sea).
Metopograpsus messor (Forskål). N. to E., N.W., and W. Australia; Oriental Region.
Chasmagnathus (*Paragrapsus*) *lævis*, Dana. N.E. to S.E. Australia; New Zealand.
**Sesarma bidens*, De Haan? N.E. Australia; Oriental Region?
*——, sp. N.E. and E. Australia.
**Pinnotheres villosulus*, Guérin-Ménéville. N. Australia (Warrior Reef, Torres Straits); Timor.
Mycteris longicarpus, Latreille. N.W., N. to E., and W. Australia; Tasmania; Indo-Malaysian and China seas; New Caledonia.
Halicarcinus ovatus, Stimpson. N.E., E., and S.W. (?) Australia.
Leucosia ocellata, Bell. N.E. and N.W. Australia.
—— *whitei*, Bell. N., N.E., and W. Australia
*—— *craniolaris*, L. (var. *lævimana*, n.). N. Australia; Indian, Indo-Malaysian, and Chinese seas.
Myra carinata, Bell. N.E. Australia; Celebes; Philippines; Hong Kong.
—— *affinis*, Bell. N. and N.E. Australia; Philippines.
—— *mammillaris*, Bell. N.E. and S. Australia (Port Denison, Adelaide).
—— *australis*, Haswell? N., N.E., and W. Australia.
Phlyxia crassipes, Bell. N., N.E., and S. Australia.
—— *lambriformis*, Bell. N., N.E., and S. Australia (Port Darwin to Bass Straits).

Nursia sinuata, Miers. N.E. and E. Australia.
[*—— *abbreviata*, Bell. E. Australia; Moreton Bay.]
Nursilia dentata, Bell. N.W. and N.E. Australia; Oriental Region (Fiji Islands, Seychelles).
**Iphiculus spongiosus*, Ad. & White. N.W. Australia (Arafura Sea); Philippine Islands.
Arcania pulcherrima, Haswell. N.W. to N.E. Australia; Borneo.
Lithadia sculpta, Haswell. N.W. and N.E. Australia.
**Oreophorus reticulatus*, Ad. & White. N. Australia (Thursday and Friday Islands); Straits of Sunda; Philippines.
*—— *frontalis*, sp. n. N.E. Australia (Port Molle).
Matuta victrix (Fabricius). N. to E. and W. Australia; Oriental Region.
*—— *inermis*, sp. n. N. Australia (Islands of Torres Straits).
Calappa hepatica (Linn.). N.E. to E. Australia (Clairmont Island, Trinity Bay, West Hill, Sydney); Oriental Region.
Dorippe dorsipes, L. N., N.E., N.W., and W. (?) Australia; Oriental Region (Zanzibar and Ibo to Japan).
*—— *australiensis*, sp. n. N.E. and E. Australia (Port Denison and Moreton Bay).

ANOMURA.

Cryptodromia lateralis, Gray. N.E. to S. and W. to N.W. Australia; Tasmania; New Zealand; Philippines and Japan.
**Petalomera pulchra*, sp. n. N. Australia (Prince of Wales Channel).
**Paratymolus bituberculatus*, Haswell (var. *gracilis*, n.). N. and N.E. Australia.
*—— *sexspinosus*, sp. n. N. Australia (Friday Island).
**Diogenes rectimanus*, sp. n. N. Australia (Prince of Wales Channel).
**Pagurus imbricatus*, M.-Edwards. N. and W. Australia (Thursday Island, Shark Bay).
*—— *hessii*, sp. n. N.W. Australia (Arafura Sea).
**Clibanarius tæniatus* (M.-Edwards). N.E. and W. Australia (Port Molle, Shark Bay).
**Eupagurus compressipes*, sp. n. N.E. Australia (Port Denison).
*—— *kirkii*, sp. n. N.W. Australia (Arafura Sea).
Petrolisthes japonicus, De Haan (var. *inermis*, Haswell). N.E. and W. Australia; seas of China and Japan.
*—— *lamarckii* (Leach). N.E. Australia (Flinders Island, Port Molle); Philippine Islands.
*—— *haswelli*, sp. n. N. and N.E. Australia (Thursday Island, Port Curtis); Koo-Keang-San.
[*—— *rugosus*, M.-Edw. N. Australia; India, Karachi.]
*—— *annulipes*, White. N. and N.E. Australia (Thursday Island, Port Denison, &c.); Philippine Islands; Seychelles.
—— ? *corallicolus* (Haswell). N.E. Australia (Port Molle).
**Polyonyx obesulus* (White, ined.). N. to N.E. Australia (Port Darwin to Port Denison); Philippine Islands.
Pachycheles pulchellus (Haswell). N. and N.E. Australia (Thursday Island, Albany Island, Holborn Island, Port Molle).
**Porcellana nitida*, Haswell, var. *rotundifrons*, n. N.W., N., and N.E. Australia (Arafura Sea, Port Darwin, Dundas Straits, Friday Island, Port Denison).
—— *dispar*, Stimpson. E. and S.E. Australia.
*—— *quadrilobata*, n. sp. N.E. Australia (Port Denison).
Galathea australiensis, Stm. N.W. to S.E. Australia (Arafura Sea to Port Stephens).

Galathea elegans, White. N. and N.E. Australia; Borneo; Philippines.
**Munida spinulifera*, sp. n. N.W. Australia (Arafura Sea).
**Mastigochirus quadrilobatus*, Miers. N. Australia (Prince of Wales Channel); Philippines.

MACRURA.

**Gebia carinicauda*, Stimpson. N. Australia (Thursday Island, &c.); Hong Kong.
**Gebiopsis darwinii*, sp. n. N. and S.W. Australia (Port Darwin); Singapore.
**Axius plectorhynchus*, Strahl. N.E. Australia (Port Molle); Luzon.
**Thalassina anomala* (Herbst). N.W. Australia (Nicol Bay); N. Australia (Thursday Island); Philippines, Borneo, &c.; Penang; Fiji Islands.
Alpheus edwardsii, Audouin. N. to E. Australia (Ports Darwin and Essington to Sydney); Oriental Region; Atlantic Region (Cape Verds?, W.-American coast from N. Carolina to the Abrolhos, Brazil); coast of California.
[*—— *gracilidactylus*, sp. n. Fiji and Sandwich Islands.]
*—— *obesomanus*, Dana. N.E. Australia (Port Molle); Fiji Islands; Mauritius.
*—— *gracilipes*, Stimpson. N.E. and S. Australia (Port Molle, Flinders Island); Corean Channel; Ceylon; Tahiti.
*—— *minus*, var. *neptunus*, Dana. N. and S.E. Australia (Thursday Island, Port Jackson); Oriental Region (to Panama).
—— *comatularum*, Haswell. N. Australia (Albany Island, Thursday Island, &c.); Ceylon; Singapore.
—— *villosus*, Milne-Edwards. N. Australia (Warrior Reef, Thursday Island).
**Pontonia* (*Conchodytes*) *tridacnæ*, Peters. N. and N.E. Australia (Warrior Reef, Keppell Islands); Fiji and Samoa Islands; Djeddah; Ibo.
**Harpilius inermis*, sp. n. N.E. Australia (Port Molle); W. Australia (Shark Bay).
[*—— *spinuliferus*, sp. n. *Hab.*?]
**Anchistia petitthouarsi*, Audouin? N.E. Australia (Port Molle); Oriental Region (Red Sea to Ousima, Japan).
**Coralliocaris tridentata*, sp. n. N. Australia (Thursday Island).
Palæmon (*Leander*) *intermedius*, Stimpson. E. Australia (Port Jackson, Sydney?); Tasmania; S.W. Australia (King George's Sound); Fiji Islands.
Sicyonia ocellata, Stimpson. N. to E. Australia (Thursday Island, Port Jackson?); Hong Kong; Ceylon.
Penæus granulosus, Haswell. N. and N.E. Australia (Port Darwin, Thursday Island, Darnley Island, Cape Grenville).
—— *velutinus*, Dana. N. Australia (Port Darwin, Thursday Island, Albany Island); W. Australia (Shark Bay); Oriental Region; Senegambia (Goree Island); West Indies? (St. Thomas?).
*—— *batei*, sp. n. N. Australia (Albany Island).

STOMATOPODA.

Squilla nepa, Latr. N. to S.E. Australia (Port Darwin to Sydney); Oriental Region.
Gonodactylus chiragra (Fabr.). N. and N.E. Australia (Port Essington to Port Molle); S.W. Australia (Swan River); Oriental Region; Mediterranean; W. Indies; Brazil; W. coast of N. America?

Gonodactylus graphurus, White (ined.), Miers. N.W. to N.E. Australia (Nicol Bay to Port Curtis); Oriental Region.

EDRIOPHTHALMIA.

Isopoda.

Ligia gaudichaudii, var. *australiensis*, Dana. N.E. to E. Australia (Port Molle to New South Wales); Singapore? Ceylon?

Ceratothoa imbricata, Fabr. N.E., S., and W. Australia (Port Essington, Sydney, Port Jackson, Murray River, Shark Bay); China; Madras; Calcutta; Java; New Zealand.

**Cirolana multidigitata* (Dana). N. Australia (Albany Island); W. Australia (Swan River); Philippines; Borneo.

*—— *schiödtei*, sp. n. N.W. Australia (Arafura Sea); Torres Straits.

*—— *tenuistylis*, sp. n. N. Australia (Prince of Wales Channel).

*—— *lata*, Haswell, var. *integra*. N. to S.E. Australia (Albany Island to Port Stephens).

**Rocinela orientalis*, Schiödte & Meinert. N. to E. Australia (Prince of Wales Channel to Moreton Bay); Oriental Region (Gulf of Suez to Philippines).

[**Æga meinerti*, sp. n. S. Australia, King George's Sound.]

**Cymodocea longistylis*, sp. n. N. Australia (Thursday Island); Singapore.

**Cerceis bidentata*, M.-Edw. (var. *aspericaudata*, n.). N. Australia (Prince of Wales Channel).

Cilicæa latreillei, Leach. N. to S.E. Australia (Thursday Island to Port Stephens); S. Australia (King George's Sound).

—— *latreillei* (var. *crassicaudata*, Haswell). N.W. to N.E. Australia (Arafura Sea to Holborn Island).

[*—— —— (var. *longispina*, n.). Bass's Straits.]

[*—— *antennalis* (White, ined.). W. Australia, Swan River.]

Haswellia carnea (Haswell). E. and S.E. Australia (Port Jackson, Port Stephens).

Anisopoda.

Paranthura australis, Haswell. N. and E. Australia (Dundas Straits, Port Jackson).

Amphipoda.

Ephippiphora kröyeri, White. N. to N.E. Australia (Dundas Straits to Port Denison); Tasmania; New Zealand?

Leucothoë spinicarpa, Abildgaard (var. *commensalis*, Haswell). N. to S. Australia, along E. coast (Thursday Island to Western Port); Great Britain, Scandinavia, &c.; Red Sea?

*—— *brevidactyla*, sp. n. N. Australia (Thursday Island).

Melita australis, Haswell. N.E. to S. Australia (Port Denison to Western Port).

Mœra ramsayi, Haswell. N. and E. Australia (Prince of Wales Channel, Port Jackson).

—— *rubromaculata* (Stm.). N. Australia (Dundas Straits); N.E. to S.E. Australia (Port Denison to Port Stephens).

*——? *crassimana*, sp. n. E. Australia (Port Jackson).

Megamœra suensis, Haswell. N. and N.E. Australia (Sue Islands, Albany Island, Port Denison).

*—— *thomsoni*, sp. n. N. Australia (Albany Island, Prince of Wales Channel, Thursday Island).

Podocerus australis, Haswell. E. Australia (Port Jackson).

Caprella æquilibra (Say). E. Australia (Port Jackson); New Zealand; Hong Kong; Mediterranean; Norway; Britain; E. coast of United States; Brazil.
*—— *attenuata*, Dana? E. Australia (Port Jackson); Rio de Janeiro.

OSTRACODA.

Cypridina albo-maculata, Baird. N. Australia (Port Darwin, Dundas Straits); W. Australia (Swan River).

CIRRIPEDIA.

Balanus trigonus, Darwin. E. Australia (Port Jackson and Sydney); New Zealand; Malaysian seas; W. coast of America; Peru; Columbia; California.
—— *amaryllis*, Darwin. N. to E. Australia (Port Darwin to Moreton Bay); Philippines; Malaysian archipelago; mouth of the Indus.
Acasta sulcata, Lam. (var.?). N. to E. Australia (Albany Island to Moreton Bay); S. Australia; W. Australia (*Lamarck*).

PYCNOGONIDA.

Achelia lævis, Hodge, var. *australiensis*, n. E. Australia (Port Jackson).
Phoxichilidium hoekii, sp. n. N. Australia (Dundas Straits, Thursday Island, Prince of Wales Channel).

DECAPODA.

BRACHYURA.

1. Achæus lacertosus, *Stimpson.*

Here is somewhat doubtfully referred a small male specimen from Port Jackson (0–5 fms.), which differs from Stimpson's diagnosis only in the somewhat slenderer merus-joint of the chelipedes, which resembles that of *A. breviceps*, Haswell (a species which Mr. Haswell in his latest work regards as synonymous with *A. lacertosus*), in being of a somewhat trigonous form; the palm or penultimate joint is thin-edged along its upper margin, but scarcely carinated.

The specimen I refer to *A. lacertosus* also bears some resemblance to the European *A. cranchii* in the absence of a neck-like constriction behind the orbits, and in the comparatively short ambulatory legs, the dactyli of the last three pairs being rather strongly falciform. In *A. cranchii*, however, the eye-peduncles have a tubercle on their anterior margin, the distal end of the merus of the outer maxillipedes is more distinctly truncated, and the ambulatory legs are even shorter.

In the second collection received from Dr. Coppinger are two females from Dundas Strait, North Australia (No. 161), which scarcely differ, except in the somewhat broader carapace.

2. Achæus affinis.

Carapace subtriangular and moderately convex, with the surface uneven, but the regions not very distinctly defined; the postorbital region is constricted. The rostrum is moderately prominent, the

frontal lobes very small and subacute. On the cardiac region is a bilobated prominence, which is usually very much elevated; there is a small angulated prominence on the hepatic regions, and occasionally one or two granules on the branchial regions, which are not at all convex. Eye-peduncles with a blunt tubercle in the middle of their anterior margins. The merus-joints of the outer maxillipedes are narrowed and subacute at their distal ends where they are articulated with the next joints. The chelipedes (in both sexes) are rather slender; margins of the arm, wrist, and palm usually with a few granules or spinules; merus somewhat trigonous; fingers as long as the palm, and somewhat incurved, with their inner margins denticulated, and having between them when closed (in the males) a small hiatus at base. The ambulatory legs are slender, filiform, and very much elongated, the second legs being, in an adult male, four times as long as the postfrontal portion of the carapace; the dactyli of the two posterior pairs only are distinctly falciform; both chelipedes and ambulatory legs are scantily clothed with long hairs. Length of carapace (including rostrum) of an adult male about 5 lines (10·5 millim.), breadth about 3 lines (6 millim.); length of second leg about 1 inch 8 lines (42 millim.): an adult female has the carapace relatively somewhat broader, length nearly $5\frac{1}{2}$ lines (12 millim.), breadth 4 lines (8·5 millim.).

The bilobated prominence on the cardiac region and tuberculated eye-peduncles serve to distinguish this species. The cardiac prominence is much more elevated in the females than in the males in the Museum Collection.

There is an adult male of this species in the first collection received from Dr. Coppinger, obtained at Port Denison, Queensland, at a depth of 4 fms. (No. 111); also an adult female from Port Jackson, 5–7 fms. (No. 104), and one from Moreton Bay, Queensland (*Warwick*); one from Shark Bay, West Australia (*F. M. Rayner*, H.M.S. 'Herald'); and other Australian specimens without special indication of locality in the Museum collection.

In the second consignment made by Dr. Coppinger were an adult male and two females from Thursday Island, 3–4 fms. (No. 177); and a female from Prince of Wales Channel, 7–9 fms.

3. **Camposcia retusa**, *Latreille.*

Several females are retained for the British-Museum collection from Thursday Island, 3–4 fms. (Nos. 175–177). It is recorded by Mr. Haswell from Cape Grenville and Port Denison. Specimens are in the British-Museum collection from Shark Bay, W. Australia (*F. M. Rayner*, H.M.S. 'Herald').

There are also specimens in the Museum collection from the Philippine Islands, Guimaras and Bureas (*Cuming*), and Fijis, Ngau (*H.M.S. 'Herald'*); also specimens from the Mauritius (*Lady F. Cole*) are probably not distinct, but are much covered with foreign overgrowth. Thus it is widely distributed throughout the Oriental Region.

4. Oncinopus aranea.

De Haan, Faun. Japon., Crust. p. 100, pl. xxix. fig. 2 (♂ ♀), and pl. H (1839).
Oncinopus neptunus, *Adams & White, Zool. 'Samarang,' Crust.* p. 1, pl. ii. fig. 1 (1848).
Oncinopus subpellucidus, *Stimpson, Proc. Ac. Nat. Sci. Philad.* p. 221 (1857); *Haswell, Cat. Australian Stalk- and Sessile-eyed Crust.* p. 5 (1882).
Oncinopus angulatus, *Haswell, Proc. Linn. Soc. N. S. Wales,* iv. p. 433 (1880).

Specimens are in the collection from Port Jackson, 5–7 fms. (No. 104), and Port Molle, 14 fms. (No. 93). Besides the above specimens the British-Museum series includes examples from Port Jackson (*J. Brazier &c.*), from Brisbane Water, Queensland (*Macgillivray*, H.M.S. 'Rattlesnake'), from the Mindoro Sea (*A. Adams*, H.M.S. 'Samarang'), and from the New Hebrides (*J. Macgillivray*).

Oncinopus subpellucidus, Stimpson, from Port Jackson, only differs (according to its author) from *O. neptunus* in the somewhat smaller and slenderer terminal and penultimate joints of the posterior legs, and can scarcely be regarded as distinct. *Oncinopus araneus* of De Haan (the species on which the genus was originally founded) was regarded by Adams and White as distinct from *O. neptunus*, on account of the much shorter legs, more deeply-incised front, with more angulated lobes; but there is an adult specimen from Port Jackson, in Dr. Coppinger's collection, in which the legs are only twice as long as the carapace, and quite as robust as in De Haan's figure of *O. araneus*; and in a male from Brisbane Water, Queensland, in the Museum collection, the chelipedes have their palms dilated, just as in the Japanese species. In consideration of the evident variability of the length and robustness of the legs in this genus, I have considered it necessary to unite all the described species under De Haan's original designation, *O. araneus*.

5. Menæthius monoceros (*Latr.*).

A male is in the collection from Port Denison, Queensland, 4 fms. (No. 111). I have in a previous Report * remarked upon the wide distribution of this common Oriental species, and for the numerous synonyma would refer to A. Milne-Edwards's report on the Crustacea of New Caledonia †.

A female received in Dr. Coppinger's second collection from Prince of Wales Channel (No. 169) differs widely in its broader, much more strongly tuberculated carapace from the male from Port Denison; in these particulars it closely resembles specimens from the Mauritius in the British-Museum collection. Specimens from Shark Bay, West Australia (*Surgeon Rayner*, H.M.S. 'Herald') nearly approach the Mauritius specimens in these particulars.

* Philosoph. Trans. Roy. Soc. clxviii. p. 485 (1879).
† *Vide* Nouv. Archiv. Mus. Hist. Nat. viii. p. 252 (1872).

6. Huenia proteus.

De Haan, Faun. Japon., Cr. p. 95, pl. xxiii. figs. 4, 5 ♂ (elongata), fig. 6 ♀ (heraldica), and pl. G (1839); *Adams & White, Cr. in Voy. 'Samarang,'* p. 21, pl. iv. figs. 4–7 (1848); *Haswell, Proc. Linn. Soc. N. S. Wales,* iv. p. 437 (1880); *Cat. Austr. Crust.* p. 9 (1882).

Huenia dehaani, *White, Proc. Zool. Soc.* p. 223 (1847).

Huenia proteus, var. tenuipes, *Adams & White, Cr.' Samarang,'* p. 22, pl. iv. fig. 5 (1848).

Huenia proteus, vars. elongata and heraldica, *Adams & White, t. c.* p. 21 (1848).

Among the Crustacea collected by Dr. Coppinger are an adult male from Fitzroy Island, Queensland, 10 fms. (No. 113); a male and female from Port Denison, 4 fms. (No. 122); and a male from Thursday Island, Torres Straits, 4–6 fms.

From the second collection were retained for the British Museum a considerable series from Thursday Island, 3–4 fms. (No. 177), a female from Prince of Wales Channel (No. 142), and four specimens from West Island, Torres Straits, 7 fms.

If the various species of *Huenia* mentioned above are rightly united under the designation *H. proteus*, it will follow that there are but three species, so far as at present known, referable to this genus—one, *H. proteus*, ranging (as Mr. Haswell has already shown) from Japan and China, southward through the Philippine Islands to the coast of Queensland and islands adjacent; another, *H. pacifica*, Miers*, from the Fiji Islands; and a third, *H. grandidieri*, A. M.-Edwards†, from Zanzibar. It is possible that a larger series would show that *H. pacifica* is no more than a marked variety of the very variable *H. proteus*; it differs, however, from all the specimens of that species I have seen in the form of the rostrum, which is not only much longer and slenderer, but also much narrower above at base.

The other described species of *Huenia* belong, as I have shown (*t. c.* pp. 5–6), to other genera.

7. Egeria arachnoides (*Rumph.*).

Here is referred an adult male from Port Molle, 14 fms. (93), a locality already mentioned by Mr. Haswell (Cat. p. 12).

This specimen presents the characters cited by Mr. Haswell (Proc. Linn. Soc. N. S. Wales, iv. p. 439) as belonging to the specimens he refers to *Egeria herbstii*—*e. g.* the orbits are widely open above, the eye-peduncles are very short and thick, and there is a spine at the distal end of the third joint of the ambulatory legs, which, however, is very small in the two posterior pairs. These characters can, however, hardly be considered of specific importance; in a smaller female from Albany Island, 3–4 fms., and in several

* Ann. & Mag. Nat. Hist. ser. 5, iv. p. 5, pl. iv. fig. 3 (1879).

† Ann. Soc. Entom. France, sér. 4, v. p. 143, pl. iv. fig. 2 (1865).

specimens in the British-Museum collection scarcely any traces exist of the meral spines above mentioned. I may add that I have observed a considerable degree of variation in the length of the rostrum in the large series of specimens of this species in the collection of the British Museum. In the type specimen of *Egeria indica* of Leach in this collection the third joint of the outer maxillipede does not in reality present any peculiarity of form, nor does this specimen differ from ordinary adult examples of the genus.

I believe, then, it will be necessary to unite under one specific designation the three forms *Egeria arachnoides*, *E. herbstii*, and *E. indica*, mentioned by Milne-Edwards*, and that to this species the name *arachnoides* must be applied rather than the Linnean designation *longipes*, because Linnæus's description of his *Cancer longipes* † differs in several particulars from *Egeria arachnoides*; thus he says "*manus ovatæ, muricatæ*," or "*scabræ*," whereas in *Egeria arachnoides* the hands are always elongated and smooth; moreover, in the middle line of the carapace are five (not four) tubercles or short spines; other distinctions might be mentioned.

Specimens of *Egeria arachnoides* are in the Museum collection from the Indian Ocean (*Hardwicke*), Philippine Islands, Zebu (*Cuming*), Shanghai (*purchased of Jamrach*), Port Curtis, Australia (*J. Macgillivray*), &c.; several other N.E. Australian localities are recorded by Mr. Haswell.

The species designated *Egeria longipes*, M.-Edw., by Adams and White‡, if correctly characterized, differs from any specimen of the genus I have seen in its very much broader, transverse front, and may belong to a distinct species.

8. Chorilibinia gracilipes.

Miers, Ann. & Mag. Nat. Hist. ser. 5, xix. p. 7, pl. iv. fig. 4 (1879); *Haswell, Proc. Linn. Soc. N. S. Wales*, iv. p. 439 (1880); *Cat. Austr. Crust.* p. 17 (1882).

In Dr. Coppinger's first collection two adult females were received from Port Molle, 14 fms. (No. 93), and one from Albany Island, 3–4 fms. (No. 109). In the second collection are a male and female from Port Darwin, 7–12 fms. (No. 173).

The types in the British Museum are from Papua, and Mr. Haswell records the occurrence of this species at Cape Grenville.

9. Paramithrax (Chlorinoides) coppingeri, *Haswell.*

An adult female is in the collection from Port Darwin, 12 fms., and two small males from Dundas Strait, 17 fms. (No. 161). Haswell's specimens were from Whitsunday Passage (H.M.S. 'Alert').

* Hist. Nat. des Crustacés, i. pp. 291, 292 (1834).
† Mus. Lud. Ulrici, p. 446 (1764); Syst. Nat. ed. xii. p. 1047 (1766).
‡ Crust. in Zool. Voy. H.M.S. 'Samarang,' p. 6 (1848).

Other specimens of this species are in the British Museum from Moreton Bay (purchased), and from the collection of H.M.S. 'Samarang,' without precise indication of locality.

The spines of the carapace vary considerably in number and length; in an adult female from Moreton Bay the two posterior spines of the carapace are absent; in a small male from the same locality both are present, although very small; in Dr. Coppinger's specimens one only is developed. In none of the specimens I have examined are the spines of the carapace knobbed at the tip. These specimens principally differ from Haswell's description in having but a single broad and usually dentated lobe behind the three straight, acute, spinous teeth of the upper orbital border, as in De Haan's figure of *P. longispinus*. They are only distinguished from *P. longispinus* by the form of the hands of the chelipedes, the palms (alike in males and females) being slenderer, with the upper margins straight, and the fingers straight and meeting along their inner edges, which are entire, without spines or tubercles on their inner margins. It is not stated if this character exists in the types of *P. coppingeri*; and I am therefore somewhat doubtful if our specimens belong to that species, which may after all be synonymous with *P. longispinus*. In the latter event the Museum examples referred to *P. coppingeri* would apparently require a distinct specific appellation.

10. Paramithrax (Chlorinoides) aculeatus, var. armatus.
(Plate XVIII. fig. A.)

I thus designate a series of specimens in the collection which apparently approach so nearly the *Chorinus aculeatus* of Milne-Edwards as to render it unadvisable to separate them specifically in the absence of figures of *C. aculeatus*. As Milne-Edwards's description * is somewhat brief, I subjoin the following description of an adult example in Dr. Coppinger's collection:—

Carapace more or less pubescent, subpyriform, moderately convex, with five spines arranged in a median longitudinal series, of which two are situate on the gastric, one on the cardiac, and one on the intestinal region, and one on the posterior margin; there are also two strong and outwardly-divergent spines on each of the branchial regions. The rostral spines are long, acute, curving outward, and separated from one another, even at their bases, by a distinct interspace; the upper orbital margin has two deep fissures; the præocular spine is strong and curves upward; there is also a strong postocular spine, which has a tooth on its posterior margin; posterior to this, on the sides of the carapace, is another small spine. On the inferior surface of the carapace (on the pterygostomian region) are three tubercles arranged in an oblique line; and posterior and parallel to these an oblique crest, which terminates in a tooth or short spine. There is a strong tooth directed downward on the interantennal septum, and

* *Vide* Hist. Nat. Crust. i. p. 316 (1834).

at the distal end of each basal antennal joint two teeth, whereof one is directed downward and one outward. The legs are more or less pubescent. The chelipedes are slender; the arm or merus-joint denticulated on its lower surface, and armed above with three or four short spines; the wrist or carpus rather obscurely bicarinated; hand (in both sexes) smooth, slender, naked, somewhat compressed, and twice as long as broad, or even longer; fingers straight and acute. The ambulatory legs are of moderate length; the merus-joints usually bear two well-developed distal spines, but one of these is occasionally absent; there is usually a short spine or tubercle at the distal end of the following joint, which is most distinct in the first pair of ambulatory legs; dactyli slightly curved. Length of the largest specimen (an adult female) to base of rostrum about $1\frac{1}{6}$ inch (30 mm.), of rostral spines $\frac{7}{12}$ inch (15 mm.), greatest breadth rather over $\frac{5}{6}$ inch (22 mm.); length of first ambulatory leg about $1\frac{1}{2}$ inch (38 mm.).

There are in the first collection several specimens of both sexes from Port Curtis, 7–11 fms. (Nos. 85, 87). In the second collection are two males from Thursday Island, 3–4 fms. (No. 175).

The spines of the dorsal surface of the carapace vary considerably in length.

Several of the specimens are more or less thickly covered with an overgrowth of Polyzoa and Sertularians (*Thuiaria* and *Crisia*), and with a species of *Zoanthus*.

From *P. aculeatus*, as described by Milne-Edwards, this variety is distinguished only by the form of the postocular spine (see fig. A), and by the existence (usually) of two spines at the distal end of the merus-joints of the ambulatory legs. From the *P. halimoides*, recently described by me, it is distinguished by having two spines on each branchial region, the form of the postocular tooth, &c. Several other species of this subgenus have been described, none of which are to be confounded with *P.* (*Chlorinoides*) *aculeatus*. *P. spatulifer*, Haswell, a species dredged at Port Stephen, is at once distinguished by its bifurcated rostral spines, &c.

11. Hyastenus diacanthus (*De Haan*).

A male and three females of this very common species are retained for the collection from Thursday Island, Torres Straits, 3–6 fms. (Nos. 130, 175), one was received from Port Denison, another from Port Molle, 14 fms. (93), another from Port Curtis, 0–11 fms. (92), and another from Port Darwin (12 fms.). As is very usual with *H. diacanthus*, these specimens are more or less covered with sponges, &c.

I have already referred to the synonyma and general distribution of this species *.

In a very small female in the collection, from Port Denison,

* Proc. Zool. Soc. pp. 19, 26 (1879); Cat. New-Zeal. Crust. p. 9 (1876).

4 fms. (No. 122), length to base of rostrum little over 5 lines (11 mm.), and in a small male from Dundas Straits (No. 161), the rostral spines are relatively somewhat shorter, and there are only very small tubercles in the place of the lateral epibranchial spines: it is not improbably a young example of *H. diacanthus*. There are specimens presenting very similar characters in the collection of the British Museum without definite locality (*H.M.S. 'Samarang'*) and from Penang (*India Museum*).

There are specimens in the British-Museum collection from the following points on the Australian coast:—Dunk Island, and lat. 20° 58′ S., long. 149° 12′ E., between Cumberland Island and Slade Point (*J. Macgillivray*, H.M.S. 'Rattlesnake'), Brisbane Water (purchased), Moreton Bay (purchased), Swan River (*Dring*), Shark Bay, West Australia (*Rayner*, H.M.S. 'Herald').

12. Hyastenus (Chorilia) oryx.

Hyastenus oryx, *A. M.-Edwards, Nouv. Archiv. Mus. Hist. Nat.* viii. p. 250, pl. xiv. fig. 1 (1872); *Haswell, Proc. Linn. Soc. N. S. Wales*, iv. p. 442 (1880); *Cat. Austr. Crust.* p. 20 (1882).

To this species are referred specimens from several different localities; *e. g.* from the first collection two males and a female from Port Molle—the males obtained between 5 and 14 fms. (Nos. 93, 118), and the female on the beach (No. 95); and a female from Port Denison, 4 fms. (No. 122); also from the second collection a good series from Thursday Island, 3–5 fms. (Nos. 165, 177), and Prince of Wales Channel, 7 fms. (No. 169), one female.

M. A. Milne-Edwards's types were from New Caledonia; Mr. Haswell records this species from Darnley Island, Torres Straits; and there are specimens in the collection of the British Museum from Raine's Islet, North-east Australia (*J. B. Jukes*), Shark Bay, West Australia (*Rayner*, H.M.S. 'Herald'), and other Australian specimens without special indication of locality (*Bowerbank*); also from the Philippine Islands, Corregidor (*Cuming*), and Chinese seas (*H.M.S. 'Samarang'*).

In the second part of this Report its occurrence is noted at Providence Island, Mascarenes.

The length of the rostral spines and prominence of the præocular tooth or lobe seems to vary considerably in this species with the age of the specimen. I regard the *Lepidonaxia defilippii* of Targioni-Tozetti*, founded on a female example, as very possibly a mere variety of *H. oryx*, from which it scarcely differs except in these particulars and in the less numerous and prominent tubercles of the carapace. Certainly it is congeneric with that species.

* 'Zoologia della Magenta:' Crostacei, p. 5, pl. i. figs. 4–6, 8, 10, 11 (1877).

13. Hyastenus (Chorilia) planasius.

Pisa planasia, *Adams & White, Crust. in. Zool. Voy. 'Samarang,'* p. 9, pl. ii. figs. 4, 5 (1848).
Hyastenus planasius, *A. M.-Edwards, N. Arch. Mus. Hist. Nat.* viii. p. 250 (1872).

A small male was obtained at Port Denison with *H. oryx* (No. 122). The original types (and specimens in the Museum collection) were from the Chinese seas.

14. Hyastenus (Chorilia) convexus. (Plate XVIII. fig. B.)

Carapace subpyriform, somewhat scantily pubescent; gastric region elevated, rounded and convex; cardiac region also somewhat elevated and rounded; branchial regions with three low rounded prominences; no lateral epibranchial spine; the præocular angle of the orbit is prominent, but can scarcely be said to be produced in the form of a spine; there are two spines on the pterygostomian region, between the lateral margins of the buccal cavity and the sides of the carapace. Spines of rostrum slender, nearly straight, and strongly divergent. Postabdominal segments distinct. Basal antennal joint with a small spine or tooth at its antero-external angle. Chelipedes of male of moderate length; merus or arm rather slender and nearly smooth; wrist with a very small tooth on its inner margin; palm not twice as long as broad, somewhat inflated, with a small tubercle on its upper margin; fingers about as long as the palm, arcuated, meeting only toward the apices, which are minutely denticulated and acute; upper finger with a tubercle or small tooth on its inner margin near the base; the fingers (when closed) have between them a wide hiatus. Ambulatory legs very slender and smooth: the anterior pair much the longest, the three following diminishing successively in length. The colour of the single specimen examined is a uniform light yellowish brown. Length of carapace a little over 5 lines (11 mm.); greatest breadth nearly 4 lines (8 mm.); length of rostral spine a little over 3 lines (7 mm.), of chelipede about 6 lines (nearly 13 mm.), of first ambulatory leg rather over 10 lines (22 mm.).

The unique male example was obtained at Port Molle, 14 fms. (No. 93), and in size and form of the chelipedes is very comparable to *H. gracilirostris*, Miers, from the Fijis, from which, however, it is at once distinguished by the absence of spines on the carapace, &c.

15. Naxia serpulifera, *M.-Edw.*

Thursday Island, 4–6 fms. (No. 130), two young males (first collection). A good series of different ages and of both sexes from the same locality has been retained from the second collection (175).

Specimens are in the British-Museum collection from Shark Bay,

West Australia (*Rayner*, H.M.S. 'Herald'), and from Raffles Bay (*Mus. Paris*).

Its occurrence at Port Essington is mentioned by Mr. Haswell.

16. Schizophrys aspera (*M.-Edw.*).

A nearly adult female is in the collection from Thursday Island, 3–4 fms. (No. 175).

Professor Alphonse Milne-Edwards * has united, I believe rightly, under the designation *S. aspera* several so-called "species" described by various authors, and I may refer to his memoir for information on the geographical distribution of this very variable species. Nevertheless, it may be found useful to distinguish two or three varieties under the different specific names formerly adopted, characterized by the armature of the carapace, rostrum, and chelipedes.

The specimen from Thursday Island is referred to the typical *S. aspera*, M.-Edwards (although in it the tooth on the middle of the lower orbital margin is obsolete). To the typical form (with which *S. serratus*, White, and *S. spiniger*, White, may be considered identical) are also referred specimens in the Museum collection from the Red Sea (?), Mauritius (*Lady F. Cole*), Madagascar (*Rev. Deans Cowan*), Ceylon (*Dr. W. Ondaatje*), and Philippine Islands (*Cuming*), and perhaps a very fine adult male from Japan (purchased).

To the variety *spinifrons*, A. M.-Edwards, characterized by possessing an accessory spinule on each rostral spine, belong specimens from Torres Straits (*J. B. Jukes*), Lizard Island (*J. B. Jukes*), and Fiji Islands, Ngau, Ovalau (*H.M.S. 'Herald'*).

I may add that there are in the British-Museum collection specimens of the very distinct species *S. dama* (Herbst) from Shark Bay and King George's Sound, West Australia (*H.M.S. 'Herald'*). This species is not mentioned in Mr. Haswell's recently published Catalogue.

Kossmann has recently † proposed a very different classification of the species of this genus, which he regards as a subgenus of *Mithrax*. He proposes (unnecessarily, as I believe) a new specific designation, *M. triangularis*, for the typical species generally designated *S. aspera* (M.-Edwards).

17. Pseudomicippa ? varians.

Pseudomicippe ? varians, *Miers, Ann. & Mag. Nat. Hist.* ser. 5, iv. p. 12, pl. iv. fig. 8 (1879).

In Dr. Coppinger's first collection a female with ova, from Port Denison, 4 fms. (No. 111), is referable to this species; in the second collection is an adult male and female from Thursday Island, 3–5

* Nouv. Archiv. Mus. Hist. Naturelle, viii. p. 231, pl. x. fig. 1 (1872).

† 'Zool. Ergeb. einer Reise im Küstengeb. des rothen Meeres,' (i.) p. 11 (1877).

fms. (Nos. 165–175). In the female the gastric region is less convex than in the type specimens, which are from W. Australia, Shark Bay.

Microhalimus deflexifrons, Haswell (*t. c.* p. 435, pl. xxv. fig. 2, and Catalogue, p. 7, 1882), from Port Jackson, is very nearly allied to this species, and may only be a variety of it; it differs, however, in the less hairy carapace with fewer tubercles and somewhat more robust ambulatory legs, also in having a spine at the antero-external angle of the basal antennal joint (in *P. varians* there is only a small tooth).

In my original notice of this species, I merely pointed out the diagnostic characters distinguishing it from *P. tenuipes*, A. M.-Edwards, which it closely resembles, on which account perhaps Mr. Haswell may have omitted to note the affinity of his *Microhalimus deflexifrons* with both. The diagnosis of the genus *Microhalimus* given by Mr. Haswell is scarcely sufficient for its proper identification.

18. Micippa thalia.

Cancer thalia, *Herbst, Naturg. Krabben u. Krebse*, iii. Heft 3, p. 50, pl. lviii. fig. 3 (1803).
Paramicippa sexspinigera, *White, List Crust. Brit. Mus.* p. 9 (1847).
Micippa thalia, *Gerstäcker, Arch. f. Naturg.* xxii. p. 109 (1856); *Alph. M.-Edwards, Nouv. Archiv. Mus. Hist. Nat.* viii. p. 238, pl. vi. fig. 1 (1872).
Micippa thalia, var. caledonica, *Kossmann, Zool. Ergebn. roth. Meer. Crust.* p. 8, pl. iii. fig. 4 (1877).
Micippa inermis, *Haswell, Pr. Linn. Soc. N. S. Wales*, iv. p. 445, pl. xxvi. fig. 3 (1880); *Cat. Austr. Crust.* p. 24 (1882).

A single female in the first collection, from Port Denison, 4 fms. (No. 111), is apparently to be referred to this species; it is of small size and densely pubescent. In the second collection is an adult female from Thursday Island, 3–4 fms. (No. 175). Specimens are in the British-Museum collection from Swan River (*Dring*), designated by White *P. sexspinigera*, and from Pa-tchu-san (*H.M.S.* '*Samarang*'); they vary somewhat in the length of the spines of the dorsal surface of the carapace.

Micippa inermis, Haswell, from Gloucester Passage, Queensland, and Port Denison (*H.M.S.* '*Alert*'), scarcely differs except in the uniformly tuberculated carapace, and must, I think, be united with *M. thalia*.

19. Micippa philyra (*Herbst*).

A male and female from Thursday Island, 3–4 fms. (No. 175), and another male and female from the same locality and depth, but larger, in the second collection, are referred here.

There are specimens in the British-Museum collection dredged between Percy Islands and the mainland in 7 fms. (*J. Macgillivray*, H.M.S. 'Rattlesnake'); Torres Straits (*J. B. Jukes*); W. Australia, Shark Bay (*Rayner*, H.M.S. 'Herald'); Philippine Islands, Gui-

maras, Luzon (*Cuming*), and the Mauritius (*Lady F. Cole*), besides others without special indication of locality.

In the larger individuals the spines of the lateral margins are more developed, and the orbits more open above than in the specimens described and well illustrated by A. Milne-Edwards. The *Paramicippa spatulifrons* (*Micippa spatulifrons*, A. M.-Edw.), to which Mr. Haswell refers specimens from Cape Grenville, is principally distinguished by the dilated palms of the chelipedes, with fingers meeting only at tips; the lateral margins are not armed with prominent spines as in *M. superciliosa*, Haswell.

20. Micippa curtispina (*Haswell*).

An adult female is in Dr. Coppinger's second collection from Thursday Island, 3–4 fms. (No. 175), and a smaller male from Prince of Wales Channel, 7–9 fms.

Haswell's types were from Port Denison.

This species is very distinctly characterized by the form of the rostrum, which is not merely deflexed but curves round so as to be inflexed at the apex; the lateral subapical lobes of the rostrum, which are very little prominent and rounded in Mr. Haswell's figures, are obsolete in the specimens I have examined.

21. Paramicippa spinosa (*Stimpson*).

Several specimens are in the collection from Port Jackson, obtained at depths not exceeding 7 fms. (No. 104). There are in the collection of the British Museum specimens from New Zealand and Brisbane Water, besides others from Port Jackson. It also occurs, according to Mr. Haswell, at Port Stephens.

The *Micippa superciliosa* of Haswell (*t. c.* p. 446, pl. xxvi. fig. 2), from Darnley Island, Torres Straits, is an interesting and apparently very distinct form, intermediate between this species and the *Micippa philyra* (Herbst). It differs from *P. spinosa* in the acute lateral spines of the rostrum &c., and from *M. philyra* in the compressed and dilated palms of the chelipedes with fingers which, when closed, meet only at the tips, on which account I should be inclined to refer it to the genus *Paramicippa*.

22. Lambrus longispinus.

Lambrus longispinus, *Miers, Ann. & Mag. Nat. Hist.* ser. 5, xix. p. 18 (1879).

Lambrus spinifer, *Haswell, Proc. Linn. Soc. N. S. Wales*, iv. p. 451, pl. xxvii. fig. 1 (1880); *Cat. Austr. Crust.* p. 35 (1882).

Port Molle, 14 fms. (No. 93), eight specimens, males and females; Port Curtis, 11 fms. (No. 87), one male—first collection: both localities anticipated by Mr. Haswell.

In the second collection are two males and a female from Thursday Island, 3–4 fms. (No. 175), and a small female obtained on the beach at Port Darwin (No. 176).

Nearly all of these specimens present the rostral characters attributed by Haswell to his *L. spinifer*, but in one example of the series the lateral teeth of the rostrum are absent. Traces of them, as very obscure tubercles, exist in the typical examples of *L. longispinus* in the British-Museum collection.

In some of the specimens the spines of the cardiac and branchial regions and of the posterior and postero-lateral margins are much more strongly developed than in others. Besides the above mentioned Australian localities, Mr. Haswell records this species from Darnley Island, and Cape Grenville.

23. Lambrus lævicarpus, *Miers.*

Two small males are in Dr. Coppinger's second collection, obtained in the Arafura Sea off the N.W. coast of Australia at a depth of 32–36 fms. (No. 160). They agree in all particulars with the typical specimen, without definite locality, in the Museum collection.

24. Lambrus longimanus *(Linn.)*.

To this species as I have defined it ('Annals', xix. p. 21, 1879) are to be referred an adult male specimen from Flinders, Clairmont, obtained at a depth of 11 fms. (No. 108); a male and a female from Port Molle, 14 fms. (No. 93); and a female of large size, with ova, from Fitzroy Island, 10 fms. (No. 113).

This species, as I have already noted, ranges from the Mauritius through the Indian and Malaysian seas to the North-eastern coast of Australia.

25. Lambrus nodosus *(Jacquinot and Lucas)*.

A small male in the first collection from Port Denison, 4 fms. (No. 122), belongs here. Specimens from the same locality are recorded by Mr. Haswell, the original types being from New Zealand. In the second collection are a male and a female from Thursday Island, 3–4 fms. (Nos. 175–177).

Small specimens of this species have a considerable resemblance to the *L. intermedius*, described by myself from the Corean seas*, where also are perhaps to be referred small specimens from Shark Bay, W. Australia (*Rayner*, H.M.S. 'Herald'), in the British-Museum collection, from which *L. nodosus* is distinguished by the prominent and globosely-rounded tubercles of the chelipedes. In *L. intermedius* the marginal tubercles of the chelipedes are flattened and (in the typical specimen) the palms are quite smooth on their upper surfaces. Very small granules exist, however, on the

* Proc. Zool. Soc. p. 30 (1879).

upper face of the palms in one (the largest) of the Shark-Bay specimens.

As there are in the British-Museum collection adult examples undoubtedly referable to *L. nodosus* from Shark Bay, collected by Lieut. Suckling, R.N., and presented by W. Wykeham Perry, Esq., it is possible that *L. intermedius* may represent merely a young condition of this species.

26. Lambrus turriger, *White*.

An adult male and female, in somewhat imperfect condition, are in the second collection, from the Arafura Sea, 32–36 fms. (No. 160).

These specimens are certainly identical with specimens from the Philippine Islands (*Cuming*) and Borneo (*Admiralty*), designated *L. turriger* by White, although in the adult male received from Dr. Coppinger the spines of the carapace are considerably longer than in the largest of these examples.

Mr. Haswell mentions the occurrence of *L. turriger* at Darnley Island.

As the description and figure of Adams and White* give an inadequate idea of this very remarkable form, I subjoin the following description of the principal specific characters, based upon an examination of Dr. Coppinger's adult male :—

The carapace is somewhat rhomboidal, constricted behind the orbits ; the front prominent, triangulate, acute and deflexed, with a small tooth or tubercle on each side near the base. The carapace is armed with long spines, whereof one is situate on the gastric, one (very long) on the cardiac, and one (very long) on each branchial region ; these spines are vertical ; there is besides a shorter spine behind and in front of each of the branchial spines, and two, directed obliquely backwards, on the posterior margin of the carapace. The chelipedes are very long, more than $4\frac{1}{2}$ times as long as the carapace, slender, and approaching more nearly to a cylindrical form than in any other species I have examined ; the palm is scarcely more dilated than the wrist; and both arm, wrist, and palm are closely tuberculated both on their upper and under surfaces ; the anterior and posterior margins are armed with longer tubercles or short spines, nearly as in the figure of Adams and White. In the smaller examples some of the shorter spines of the carapace may not be always developed, but the four long vertical spines of the gastric, cardiac, and branchial regions and the two spines of the posterior margin are always distinct.

27. Lambrus hoplonotus, var. granulosus, *Miers*.

Three specimens from Flinders, Clairmont, N.E. Australia, 11 fms. (No. 108, first collection), and one from Port Darwin, 12 fms. (second collection), agree more nearly with this variety than with any other of this protean species, but exhibit a marked approach to var. *longioculis* in the subspiniform tubercles of the gastric, cardiac, and

* Zoology H.M.S. 'Samarang,' Crustacea, p. 26, pl. v. fig. 2 (1848).

branchial regions; the margins of the rostrum are, however, minutely denticulated, and the eyes do not project so much beyond the orbits as in the latter-mentioned variety. There can be no doubt that the two pass into one another by insensible gradations.

The range of *L. hoplonotus* (so far as ascertained) is from Ceylon eastward, through the Philippine Islands to the N.E. coast of Australia, whence Mr. Haswell records it from Darnley Island, Cape Grenville, and Port Denison; also from Albany Island and Port Molle (*H.M.S.* '*Alert*').

M. A. Milne-Edwards mentions its occurrence at New Caledonia.

28. Lambrus (Parthenopoides) harpax.

Lambrus harpax, *Ad. & White, Zool.* '*Samarang,*' *Crust.* p. 25, pl. vi. fig. 3 (1848); *Haswell, Proc. Linn. Soc. N. S. Wales,* iv. p. 450 (1880); *Cat. Austr. Crust.* p. 32 (1882).

? Lambrus (Parthenope) sandrockii, *Haswell, t. c.* p. 452, pl. xxvii. fig. 2 (1880); *Cat.* p. 36 (1882), var.

An adult female bearing numerous ova is in the first collection from Thursday Island, Torres Straits (No. 130), and a small and imperfect male from Port Molle (No. 93); also an adult and a smaller male from Thursday Island, 3–4 fms. (No. 177) (second collection).

Mr. Haswell mentions the occurrence of this species at Albany Passage (*H.M.S.* '*Alert*').

In the adult specimens the depressions separating the branchial from the gastric and cardiac regions are wide and deep, and these regions are convex and covered with low tubercles; there is a deep concavity on the postfrontal region; the front itself is almost vertically deflexed; the margins of the carapace are armed with about a dozen oblong laminate teeth, which increase in size towards the postero-lateral angles, and whose margins are themselves crenulated; the postero-lateral marginal spines are large and laciniated (*i. e.* each bearing two or three smaller lateral spines or teeth). The chelipedes are robust and more or less tuberculated; arm strongly dentate on its anterior margin and with two or three spines on its posterior margin. Palm with a curved longitudinal series of larger rounded tubercles on its inner surface; the tubercles on its outer surface also showing a disposition to arrangement in longitudinal series; its inferior margin thin-edged and granulated. Fingers dentated on their inner margins, upper finger with a high dentated crest. Ambulatory legs compressed; third, fourth, and fifth joints somewhat cristated above; in the last pair the crests are more elevated and interrupted, and there are two or three spines on the lower margins of these joints. Length of the largest specimen (female) about 1 inch 2 lines (30 millim.), and greatest breadth (not including lateral branchial spines) about 1 inch 1 line (28 millim.).

The above description, although not exhaustive, will suffice (when compared with that given by Adams and White in their work above cited) to indicate the manifold differences between what I regard as the adult and young of this species. A specimen marked as the

type of their description is in the collection of the British Museum, and is of very small size (length 6 lines, 12½ millim.); surface of the carapace nearly smooth, with the regions little prominent and but slightly granulated; a spine on the gastric and cardiac regions and a somewhat obscure ridge on the branchial regions; teeth of the antero-lateral margins nearly confluent, postero-lateral spines with scarcely any traces of lateral teeth &c. Very similar characters are exhibited by the small specimen from Port Molle (No. 93). In the smaller male from Thursday Island (No. 177) and in two specimens from the Australian seas, the largest of which measures about 10 lines (21 millim.), and which were dredged by Mr. Macgillivray during the voyage of H.M.S. 'Rattlesnake,' in 7 fms. between Percy Island and the mainland, in lat. 21° 50′ S., long. 150° 20′ E., there is a considerable approach to the larger specimens from Thursday Island: in all the spines of the gastric and branchial regions are nearly obsolete; but in two specimens the carapace is nearly smooth, in the others it is granulated nearly as in the large specimen from Dr. Coppinger's collection, the spines of the postero-lateral angles are less prominent and less distinctly laciniated than in that example, though bearing distinct traces of lateral teeth.

I have entered thus fully into the distinctions observable between these specimens, because of the great degree of variability that exists in many species of Parthenopidæ; no one, I think, comparing two specimens at opposite ends of the series would regard them as belonging to one and the same species.

29. Cryptopodia fornicata (*Fabr.*).

Port Curtis, 11 fms. (No. 87), a female, first collection; Thursday Island (No. 175), second collection, a young male. Specimens are in the British-Museum collection of this common species from the Indian Ocean (*General Hardwicke*); Borneo (from the *India-Museum collection*); Philippine Islands, Mindoro (*Cuming*); Japan (*Jamrach*); Lizard Island (*J. Macgillivray*); and Moreton Bay (*Warwick*). Additional Australian localities mentioned by Mr. Haswell are Brook Island, Cape Grenville, and Port Denison.

It was collected in the Chinese seas during the voyage of H.M.S. 'Samarang.'

A very small male from Thursday Island (No. 165) has the carapace and under surface of the chelipedes smooth, the gastric depression shallow, and scarcely any trace of the oblique ridges on the branchial regions usually characteristic of *C. fornicata*.

30. Cryptopodia spatulifrons, *Miers*.

An adult male was received with Dr. Coppinger's second collection from Thursday Island, 3–4 fms. (No. 175), and a smaller male from Prince of Wales Channel, 7 fms. (No. 169).

The larger example has the carapace more distinctly and coarsely pitted than the typical specimen in the Museum collection from

Shark Bay (*H.M.S.* '*Herald*'); the smaller specimen, which is referable to the variety I have designated *lævimana*, is not pitted at all, and the carapace is granulated only on the posterior part of the cardiac region, on the elevated parts of the branchial regions, and on the posterior and postero-lateral margins.

Mr. Haswell records a variety from Port Jackson which has the carapace ornamented with numerous small circular brown spots. In the specimens I have examined the carapace is generally uniformly pinkish or whitish; but in the largest male from Thursday Island it is whitish, with a few large blotches of brownish pink on the gastric and branchial regions and posterior margin.

31. Gonatonotus pentagonus.

Gonatonotus pentagonus, *Adams & White*, *Proc. Zool. Soc.* p. 58 (1847); *Zool. H.M.S.* '*Samarang*,' *Crust.* p. 33, pl. vi. fig. 7 (1848); *Miers*, *Proc. Zool. Soc.* p. 29 (1879); *Haswell*, *Proc. Linn. Soc. N. S. Wales*, p. 455 (1880); *Cat. Austr. Crust.* p. 38 (1882).

Two very small females are in the collection from Thursday Island, 4–6 fms. (No. 130), first collection, length little over 3 lines (7 millim.); and a somewhat larger male from the same locality, 3–4 fms. (No. 177), second collection. The largest specimen in the Museum collection, a male from near Billiton Island, in the Javan sea, is about 6 lines (nearly 13 millim.) in length. Mr. Haswell records this species from Port Denison; the typical example of Adams and White was from Borneo.

Gonatonotus crassimanus of Haswell is a very nearly allied but apparently well-characterized species from Port Jackson, differing, as its author notes, in its more deeply-cleft rostrum and in other points.

32. Euxanthus huonii (*Lucas*).

A male from Clairmont, east coast of Australia, obtained from a coral-reef (No. 151), belongs here.

Mr. Haswell mentions ('Catalogue,' p. 47) its occurrence at Cape Grenville.

M. Alph. Milne-Edwards remarks* that *Euxanthus sculptilis*, Dana, should perhaps not be distinguished from *Eu. huonii*. If the two species are to be united, Dana's specific name will, I believe, have priority; but I prefer to regard them for the present as distinct. In *Eu. huonii*, as described and figured by A. Milne-Edwards, and in the specimen of the 'Alert' collection, the black coloration of the fingers extends along the outer surface of the palm; no trace of this is apparent in Dana's figure of his *Eu. sculptilis*, nor in two specimens in the British-Museum collection, one of which is from the Philippine Islands and designated, I think, by M. A. Milne-Edwards *Eu. huonii*, the other from Trinity Bay, N.E. Australia; both I refer, at least provisionally, to *Eu. sculptilis*.

* Nouvelles Archives du Muséum, i. p. 291 (1865).

33. Euxanthus tuberculosus. (Plate XIX. fig. A.)

Carapace transverse, moderately convex, everywhere covered with numerous closely-set rounded tubercles, which in the adult are themselves distinctly punctulated; similar tubercles cover the outer surface of the wrist and palm of the chelipedes and the posterior surface of the ambulatory legs; the cervical suture and the suture defining the anterior part of the mesogastric lobe are deep and well defined; the tubercles are smallest, but yet distinct, on the cardiac and intestinal regions and posterior and postero-lateral margins; the frontal margin is divided by a rather deep median notch; the antero-lateral margins are divided into four rounded tuberculated lobes, the first of which is often scarcely distinguishable. The parts of the body immediately below the antero-lateral margins are granulated, but the rest of the inferior surface is nearly smooth, the sternum and postabdomen rather coarsely punctulated; the basal antennal joint enters (in the adult) well within the inner orbital hiatus; the merus-joint of the outer maxillipedes is transverse and much shorter than the preceding joint. The chelipedes are robust; the merus or arm short, and tuberculated at its upper and distal extremity; wrist and palm (as stated above) closely tuberculated on their upper and outer surfaces, the tubercles, even in the adult, somewhat conical and acute; inner margin of the palm having some small granules; fingers shorter than the palm, denticulated on their inner margins, and having between them when closed scarcely any hiatus; mobile finger granulated above at base; both fingers obtuse and rounded at apex, or (in the smaller examples especially) even somewhat excavated. The fourth to sixth joints of the ambulatory legs are compressed, tuberculated; the tubercles (of the superior margin especially) high, conical, and acute; the dactyli are small, slender, armed with small subspiniform granules, and pubescent distally, with a small naked terminal claw. Length of the largest adult example (from which the description is taken) 11 lines (23 millim.), greatest width nearly 1 inch 4 lines (33 millim.).

Of this species, an apparently adult but not full-sized male and female are in the second collection from Thursday Island (No. 167), obtained on the beach; a young male from the same locality (No. 177), and another young example from Warrior Reef, Torres Straits, 10 fms. (no. 137). There are in the British-Museum collection a male from N. Australia (*Dr. J. R. Elsey*), and an adult male from the Australian seas without definite locality, from which the description and figure are taken (*Dr. J. S. Bowerbank*). The coloration varies in the different examples, all of which are preserved in spirit: the two specimens which have been longest in the collection are a chocolate-brown; the two largest specimens in the 'Alert' collection (No. 167) are of a deep purplish red, and the two smallest of a bright orange hue.

As the basal antennal joint enters well within the inner orbital hiatus (see fig. *a*), this species must, I think, be referred to the genus *Euxanthus*, from all the species of which genus known to me

it differs in the character of the tuberculation of the carapace and legs. In the smaller examples the tubercles are much smaller and more acute, and these specimens have much the aspect of certain *Actææ*, e. g. *A. granulata*, Audouin, and *A. carcharias*, White; from both of which species they may be distinguished upon the most superficial examination by the smoothness of the sternum and post-abdomen.

A small specimen from Tasmania in the British-Museum collection, designated "*X. peronii*, M.-Edw.," in, I think, Prof. A. Milne-Edwards's handwriting, and two from Bass Straits, received with fishes of H.M.S. 'Challenger' collection, are intermediate between this genus and *Actæa*, and are principally distinguished by the smooth, more distinctly separated and rounded tubercles of the carapace and the longer spines of the ambulatory legs. I believe the *Xantho spinosus* of Hess to be identical with *A. peronii*.

*Actæodes polyacanthus**, from the Red Sea, comes very near this species, but has five acute antero-lateral marginal teeth, &c.

Euxanthus maculatus, Haswell† (which is only known to me by the author's brief diagnosis), from Darnley Island, differs in the form of the teeth of the antero-lateral margins and the existence of longitudinal rows of pits on the outer surface of the hands.

34. **Hypocœlus punctatus.** (Plate XIX. fig. B.)

The carapace is transverse, somewhat broader in proportion to its length than are specimens of *H. sculptus* in the Museum collection. As in that species it is everywhere strongly lobulated, the lobules rounded, convex, and separated by deep intervening grooves, the cervical suture being even wider and deeper than the rest; the lobules are rather coarsely punctulated. The front is rather obscurely bilobated (besides the rounded lobe over the inner orbital angle); the antero-lateral margins are strongly arcuated and cristiform, with scarcely any indications of any antero-lateral teeth except the last, which is small and little prominent; the postero-lateral margins are shorter than the antero-lateral margins and deeply concave. The inferior parts of the body are more or less coarsely pitted; the pterygostomian cavity is smaller than in *H. sculptus*, but rather wider than in a specimen of *H. granulatus* in the Museum collection, nearly ovate in outline, and divided along its greatest width by a crest running parallel to that part of the antero-lateral margin that borders the cavity above. The basal antennal joint enters the inner orbital hiatus, but not so deeply as in *H. sculptus*. The chelipedes resemble those of *H. sculptus*; the wrist and palm, however, are strongly pitted on their upper and outer surfaces, whereas in specimens of *H. sculptus* in the Museum collection these pits are absent from the wrist and from the upper surface of the palm. Fingers

* *Chlorodius polyacanthus*, Heller, Sitz. Akad. Wien, xliii. (i.) p. 339, pl. ii. fig. 21 (1861).

† Proc. Linn. Soc. N. S. Wales, vi. p. 751 (1881); and 'Catalogue,' p. 48 (1882).

nearly as in *H. sculptus*. The ambulatory legs are slender, with the penultimate and antepenultimate joints rugose and pitted. The colour (in a spirit-specimen) is reddish upon a yellowish ground. Length of carapace $8\frac{1}{2}$ lines (18 millim.), breadth about 1 inch (25 millim.).

A single male was obtained at Thursday Island, 3–4 fms. (No. 175).

It may be at once distinguished from *Hypocœlus sculptus* (M.-Edwards) and *H. granulatus* (De Haan) by the crest or ridge dividing the cavities of the pterygostomian regions (fig. *b*).

The species of this curious genus appear to be rare. I have seen no specimens of *H. punctatus* except the unique type example. Of *H. sculptus* there are in the Museum three specimens—one from the Red Sea (*J. Burton*), one from the Gulf of Suez (*R. MacAndrew*), and one from the Mauritius. Of *H. granulatus* there is but one specimen, a mutilated male without indication of locality, in the national collection.

35. Atergatis floridus (*Linn.*).

Of this very common and widely distributed species five specimens (males and females), obtained on a coral-reef at the Clairmont Islands, N.E. coast of Australia (No. 151), are retained for the British Museum.

Specimens are in the national collection from Port Essington, Trinity Bay (*J. Macgillivray*, H.M.S. 'Rattlesnake'), and Swan River (*H. Dring*); also from Port Natal (purchased), and from the Philippine Islands, Guimaras (*H. Cuming*); Java, Karang-bollong, and Amboina (*Dr. P. Bleeker*); Indian Ocean (*Old Collection*); Ceylon, Galle (*Dr. W. Ondaatje*); Duke of York Island (*Rev. G. Brown*); Sunday Island (*J. B. Jukes*); Minerva Reef (*H.M.S. 'Herald'*); Fiji Islands, Ovalau, Totoya (*H.M.S. 'Herald'*); Samoa Islands, Upolu (*Rev. S. J. Whitmee*); and others with less definite indication of locality.

36. Lophozozymus epheliticus (*Linn.*).

Port Molle (No. 95). A small male, having the beautiful coloration usual in this common species, was obtained on the beach.

Mr. Haswell mentions its occurrence at Cape Grenville (as *L. octodentatus*).

Specimens are in the collection of the British Museum from New South Wales (*G. Krefft*); Darnley Island (*J. B. Jukes*); Nicol Bay, N.W. Australia (*Mr. Du Boulay*); Philippine Islands (*Cuming*); Java (*Bleeker Collection*); and others without definite locality.

The coloration, both in dry and spirit specimens, is variable; ordinarily carapace and legs are crimson or orange-red with white spots, but sometimes the white greatly predominates, and the red forms irregular patches and reticulating lines.

37. Galene granulata. (Plate XX. fig. A.)

Carapace narrower in proportion to its length than *Galene bispinosa*, Herbst, the whole of the upper surface granulated, the granules, however, somewhat unevenly disposed; the cervical and cardiaco-branchial sutures are distinctly defined. In *G. bispinosa* (Herbst) the carapace is granulated only near the lateral margins. The two median teeth of the front are distinctly developed, but the two lateral teeth (those over the inner orbital hiatus) are obsolete; these teeth are very distinct in *Galene bispinosa* (Herbst). The antero-lateral margins have three distinct tuberculiform teeth; there are but two developed in *G. bispinosa*; the palms of the chelipedes are granulated over the whole of their outer surface, whereas in *G. bispinosa* the granulations exist only at the base, near the articulation with the wrist.

Of *G. granulata* there is but one specimen in the collection, a small male from Port Darwin, 7–12 fms. (No. 173).

The characters enumerated above, important though they may appear, may possibly be found to be dependent on the age and size of the specimen, the length of whose carapace is only $5\frac{1}{2}$ lines ($11\frac{1}{2}$ millim.), less than one fourth of the length of an adult example of *G. bispinosa* from Singapore (*A. R. Wallace*) in the Museum collection, and which is the only specimen I have examined; but I do not feel justified in uniting the two forms in the absence of any specimens with transitional characters. Both the specimens of *G. bispinosa* and of *G. granulata* are imperfect, that of *G. bispinosa* having lost the postabdomen, and that of *G. granulata* all except one of the ambulatory legs.

38. Halimede? coppingeri. (Plate XX. fig. B.)

In this curious little species the carapace is anteriorly somewhat deflexed, with the antero-lateral margins somewhat shorter than the postero-lateral; body and legs are alike covered with a close velvety pubescence. The *sulci* defining the regions of the carapace are indistinguishable; the carapace is tuberculated, the tubercles rather large, and arranged in rather irregular transverse series. The front is divided by a median notch into two rather prominent rounded lobes, on either side of which the exterior angles form less prominent teeth. The upper orbital margin has a large blunt tubercle behind the outer frontal lobes. The antero-lateral margins have four very distinct tuberculiform teeth, the first of which is situated immediately behind the exterior angle of the orbit. The epistoma is transverse, the pterygostomian regions without spines or tubercles. The postabdomen in the female has all the segments distinct. The eye-peduncles are short and robust; the antennules nearly transversely folded; the basal antennal joint reaches beyond the subfrontal process, and thus enters within the inner orbital hiatus; the two following joints are slender; the flagellum filiform and rather long. The merus-joint of the outer maxillipedes is, as

usual, nearly quadrate, with the anterior margin straight, and has the next joint articulated with it at its antero-internal angle. The chelipedes are subequal and moderately robust; the merus or arm short, trigonous, its upper margin distally armed with three or four teeth; carpus or wrist very distinctly tuberculated on its upper and outer surface; palm with only three or four tubercles appearing through the pubescence at base; fingers little shorter than the palm, pubescent, except at and near the tips, which are acute, regularly denticulated, and closing along their inner margins. The ambulatory legs are slender, rather long, and densely pubescent; the merus-joints have a tubercle at their distal, and the carpus-joints one at their proximal ends. Colour cinereous grey. Length of the single specimen examined (a female) about $3\frac{1}{2}$ lines (nearly 8 millim.), breadth about $4\frac{1}{2}$ lines (nearly 10 millim.).

This specimen was dredged in the Arafura Sea, at a depth of 32–36 fms. (No. 160).

In the structure of the antennæ and orbits (see fig. *b*) this species resembles *Euxanthus* and *Liagore*, but the form of the strongly tuberculated and densely hairy carapace seems to preclude its being assigned to either of these genera. In these particulars and in the slender ambulatory legs it more closely resembles *Halimede fragifer*, De Haan; and I have accordingly assigned it to the genus *Halimede*, although with some uncertainty, since De Haan in his description does not say whether the basal antennal joint enters within the inner orbital hiatus or is merely in contact with the subfrontal process; if the latter, our new species will, I think, have to be made the type of a new generic division.

39. Actæa rüppellii (*Krauss*).

To this species must, I think, be referred a small and very hirsute female from Port Molle, 14 fms. (No. 93), and a somewhat larger female with very prominent and distinctly granulated areolæ on the carapace, obtained at Port Denison, 4 fms. (No. 122), first collection; also two small females from Thursday Island, 3–4 fms. (No. 177), second collection.

There are specimens in the British-Museum collection from the Mauritius (*Old Collection*) and Malaysian seas (*coll. Dr. Bleeker*); perhaps also a specimen from Norfolk Island, 23 fms. (*H.M.S. 'Herald'*), belongs here.

I have already, in my report on the late Dr. Bleeker's Malaysian collection*, given the leading references to the synonyma of *Actæa rüppellii*.

40. Actæa areolata, *Dana*?

To this species are very doubtfully referred several specimens of both sexes from Port Molle, obtained either on the beach (Nos. 95, 103) or at a depth of 14 fms. (No. 93). The largest example mea-

* Ann. & Mag. Nat. Hist. ser. 5, v. p. 232 (1880).

sures 5 lines (10½ millim.) in length, and about 8½ lines (18 millim.) in breadth.

In two of these specimens the coloration is reddish brown, with the very short pubescence of a brownish hue; the three others (103) are much paler, and the pubescence is of a light hue.

These specimens agree with Dana's description and figures in most particulars, and especially in the very considerable transverse width of the carapace, very concave postero-lateral margins, and very short pubescence of the carapace, wherein they differ from most other species of *Actæa*; the lobes of the antero-lateral margins of the carapace are, however, very indistinct and are themselves interrupted; and the areolæ of the upper surface appear to be much more strongly defined and separated by deeper furrows than in Dana's figure*. His specimens were from the Sooloo Sea or Balabac Straits.

Actæa consobrina of Alphonse Milne-Edwards† is a closely allied species from Upolu, which, as far as can be learned from the very brief diagnosis, is only distinguished by the lighter coloration and 4-lobed antero-lateral margins. It may not be distinct from *A. areolata*, or, if distinct, perhaps our specimens should be referred to it.

41. **Banareia inconspicua.** (PLATE XIX. fig. C.)

Carapace transverse, moderately convex, everywhere clothed with rather short hairs, beneath which the surface is granulated; similar hairs cover the upper surface of the legs; the carapace is not lobulated, nor are the interregional sutures visible; the front is 4-lobed, the lobes small, rounded, and equidistant. The antero-lateral margins are longer than the postero-lateral, unevenly granulated, with very obscure traces of division into teeth or lobes; the postero-lateral margins are strongly concave. The epistoma is almost linear-transverse; the anterior margin of the buccal cavity projects, and is divided by two very distinct fissures. The post-abdomen presents nothing remarkable. The antennules are obliquely folded; the antennæ have a rather stout basal joint, which reaches to the infero-lateral angle of the front, and a rather long flagellum. The ischium-joint of the outer maxillipedes is but little longer than the merus, which is nearly quadrate. The chelipedes are nearly smooth and unarmed, without spines or tubercles; the merus or arm is trigonous, its upper and lower margins fringed with hairs; the wrist is clothed with hair on its upper and outer surface, the angle on its inner surface prominent, but without a tooth or spine; palm also hairy above and on the upper part of its outer surface, naked on the lower part, where it is punctulated, and granulated on its lower margin; fingers nearly as long as the palm, naked (except at the base of the upper margin of the mobile finger or

* U.S. Explor. Exped. xiii. Crust. i. p. 162, pl. viii. fig. 1 (1852).
† Journal Museum Godeffroy, iv. p. 79 (1873).

dactyl, where there are a few hairs), acute at their apices, and denticulated on the inner margins only at base, the margins (in their distal half) thin-edged and entire. Ambulatory legs of moderate length and rather compressed; the dactyli very short. Colour (in spirit) purplish or fuscous brown. Length a little over 5 lines (11 millim.), breadth nearly 8 lines ($16\frac{1}{2}$ millim.).

Two specimens (males) were obtained on the beach at Port Darwin (No. 176).

The absence of any distinct lobation of the carapace or of distinct antero-lateral marginal teeth is very characteristic of this species, which is also distinguished by its quadrilobate front. (See fig. *c*.)

I at first referred this species to the genus *Actæa*, not having observed the notches in the front of the endostome*, which in one specimen are nearly obliterated. In a specimen sent by Mr. Haswell from Port Denison, which in its narrower carapace connects this species with *Atergatopsis*, these notches are deep and well defined. In two specimens in the Museum collection which I refer to the typical *Banareia armata*, A. M.-Edwards (since they agree with that species in all particulars except in the notches of the endostome), they are nearly obliterated.

The genus *Banareia* apparently connects the genera *Actæa* and *Atergatopsis*, and will have, perhaps, to be united with the latter, with which it agrees in the somewhat broader basal antennal joint and narrow naked acute finger-tips.

42. **Xantho macgillivrayi.** (Plate XX. fig. C.)

Carapace transverse, of the form usual in this genus, with the cervical suture and the depressions separating the prominences of the postfrontal, gastric, hepatic, and branchial regions very distinct; these lobules are themselves granulated, the granules being for the most part disposed in short transverse raised lines or low ridges, which are most prominent on the anterior part of the carapace; the intestinal region is plane and more or less punctulated. The front is rather prominent, and (in an adult example) more than one fourth the greatest width of the carapace, and is divided by a very slight median notch into two truncated lobes, exterior to which on each side is a small and less prominent tooth, formed by the inner and upper angle of the orbit; the antero-lateral margins are armed with four rather small but acute and well-defined teeth, which increase regularly in size from the first to the last; the subhepatic and pterygostomian regions and the postero-lateral margins of the carapace are granulated. There is a small tooth at the outer and another at the inner suborbital angle. The male postabdomen is 5-jointed, the third to fifth segments coalescent; that of the female is 7-jointed. The eye-peduncles are small, and thickened at their bases. The basal antennal joints are in contact with the subfrontal lobes. The outer maxillipedes present nothing remarkable, having the ischium-

* Annales de la Soc. Entom. de France, sér. 4, ix. p. 168, pl. viii. (1869).

joint longitudinally canaliculated, and the merus truncated at its distal end, and with the antero-external angle little prominent. The chelipedes are moderately robust; merus or arm very short, trigonous; carpus or wrist nearly as large as the merus, with a rather prominent tooth on its inner margin, and its upper and outer surfaces marked with raised reticulating or anastomosing granulated lines or ridges; palm longer than the wrist, with somewhat similar sculpture on the upper surface, which has also two longitudinal depressions; on the outer surface the granulations (on the larger chelipede) are almost wholly obliterated, but in the smaller chelipede (which is the left in the two males I have examined) they cover the whole of the outer surface; the inner surface of the palms are smooth; fingers purplish brown, the coloration not extending over any part of the inner or outer surface of the palms. The mobile finger is canaliculated above, and has a very prominent tooth on its inner margin at base. Ambulatory legs of moderate length; merus-joints nearly smooth, but with their upper margins thin-edged and almost carinated; the two following joints are roughened, and marked on the sides with longitudinal depressions; terminal joints clothed with a dense velvety pubescence. The colour (of specimens preserved in spirit) is a pale yellowish brown. Length of the carapace of the largest specimen (a male) about $7\frac{1}{2}$ lines (16 millim.), greatest width nearly 11 lines (23 millim.).

A male and female are in the collection from Port Molle, obtained on the sandy beach (Nos. 95, 103), and a male of larger size from Port Curtis, 7–19 fms. (No. 85). In the female the outer surfaces of both palms are vermiculated, and the fingers are pale purplish.

A male is in the British-Museum collection from Facing Island, Port Curtis, obtained under stones at low water (*J. Macgillivray*, H.M.S. 'Rattlesnake').

This species has much the aspect of a *Leptodius*, and is distinguished from all with which I am acquainted by the armature of the carapace and chelipedes. It bears a very considerable resemblance to a species from Marseilles in the Museum collection (*Coll. Leach*), referred by Leach, but wrongly, to *Xantho poressa* of Olivi*, and designated by White (in manuscript) *X. confusus*, in which, however, there are no transverse granulated lines on the carapace, which is punctulated anteriorly. I have much pleasure in naming it after the late Mr. Macgillivray, by whom a specimen was collected, and by whose exertions the carcinological collections of the British Museum have been so much benefited.

X. hirtipes, M.-Edwards, to which is referred a specimen without special locality in the Museum collection, has some indications of raised lines upon the carapace, but has a much less prominent straighter front.

43. Cycloxanthus lineatus, *A. M.-Edw.*

To this species are referred, though with some hesitation, two

* 'Zoologia Adriatica,' p. 48, pl. ii. fig. 3 (1792).

females in the second collection, the one obtained at Friday Island, Torres Straits, 10 fms. (No. 158), and the other in the Arafura Sea, 32–36 fms. (No. 160). These specimens are both of very small size, one with ova measuring only $2\frac{1}{2}$ lines (5 millim.) in length. They differ from M. A. Milne-Edwards's description and figure in being (in spirit) of a uniform ashy-grey colour, and in having the surface of the carapace very uneven, well-marked depressions existing at the back of the cardiac region and in front of each branchial region; the surface of the body, viewed under the microscope, is minutely and very closely granulated, but appears smooth to the naked eye.

Milne-Edwards's examples are from New Caledonia and Lifu, and are much larger, the carapace measuring over half an inch (13 millim.) in length. The inequalities of the carapace observable in our specimens may very probably disappear as the animal increases in size; therefore I do not regard the Australian specimens as belonging to a distinct species.

Cycloxanthus punctatus, Haswell (Catalogue, p. 50), from the Paramatta River, seems to be a very distinct form, to judge from the brief diagnosis*.

44. Carpilodes venosus, *M.-Edw.*

A female from Port Molle (No. 95), obtained on the beach, belongs here.

This specimen (preserved in spirit) is of a deep purplish-red hue, and has the *sulci* defining the areolets of the carapace very distinctly defined, and altogether corresponding in arrangement with the same *sulci* in De Haan's figure of his *C. obtusus*, which is, I believe, a mere variety of this species. The length of this example is a little over 7 lines (15 millim.), and its greatest width nearly 1 inch (25 millim.).

In a larger female example from the Japanese seas, presented to the British Museum by Capt. H. C. St. John, R.N., and received since the publication of my report on the Podophthalmia of his collection—length of carapace over 10 lines (22 millim.), width 1 in. 5 lines (36 millim.)—the colour (in spirit) is a lighter orange-red, and several of the *sulci* of the carapace less distinctly defined or partially obliterated; this is no doubt due to the greater age of the specimen.

Stimpson† mentions the occurrence of *C. venosus* (as *Liomera obtusa*) at Ousima Island in the Japanese seas; and there is a specimen in the British-Museum collection from the Philippine Islands, Corregidor (*Cuming*), designated *C. venosus*, and others from Sir C. Hardy's Island, dredged in 11 fms. (*J. B. Jukes*), &c. Its range extends from the Mauritius to New Caledonia.

* It may be useful here to mention that *Panopeus acutidens*, Haswell (*t. c.* p. 51, pl. i. fig. 2), is scarcely to be regarded as distinct from *Epixanthus dentatus* (*Panopeus dentatus*, Ad. & White), of which there are authentic specimens in the British-Museum collection.

† Proc. Ac. Nat. Sci. Phil. p. 31 (1858).

The Oriental specimen referred by White (List Crust. Brit. Mus. p. 13, 1847) to *C. venosus* certainly does not belong to this species.

45. Leptodius exaratus (*M.-Edw.*).

Here are referred, at least provisionally, an adult male from Port Curtis (No. 95), obtained on the beach, and two smaller specimens dredged in 7–11 fms. at the same locality (No. 85), also six specimens obtained on the beach between tide-marks at Port Molle (No. 103).

The Port-Curtis examples and one from Port Molle (in spirit) are of a yellowish-brown or greenish hue; the five remaining examples from the latter-mentioned locality are purplish red, the carapace being obscurely punctulated with spots of a similar but darker hue. Several of these specimens, in the form of the teeth of the antero-lateral margins and in the lesser distinctness of the areolation of the carapace, resemble *L. gracilis* (Dana), as do also specimens in the British-Museum collection from Australia, the Mauritius, and the Fiji and Sandwich Islands; but these are connected by such gradual and insensible gradations with the more convex distinctly-areolated and irregularly-toothed specimens referred to *L. exaratus*, that I must regard *L. gracilis* as very doubtfully distinct.

Prof. Alphonse Milne-Edwards and others have referred to the wide geographical distribution of this common Oriental form*; and on this account, and also because of the uncertainty I at present feel regarding the true specific limitations of *L. exaratus*, I think it at present needless to refer in detail to the numerous examples in the British-Museum collection which belong to it or to closely allied types. I may note, however, the occurrence of several varieties (as I believe) of this species at Shark Bay, W. Australia (*H.M.S. 'Herald'*).

46. Leptodius lividus.

Xantho lividus, *De Haan, Faun. Japon., Crust.* p. 48, pl. xiii. fig. 6 (1835).

Seven small specimens, males and females, are in the collection; the carapace of the largest male measures but 5 lines (nearly 11 millim.) in length and 8 lines (17 millim.) in width; these specimens (in spirit) are of a pale greenish or brownish yellow, and agree in all particulars with De Haan's diagnosis, except that the chelipedes have their palmar joints (like the wrists) rather coarsely granulated or even rugose on the upper and on the upper part of the outer surfaces.

These specimens were obtained on the beach at Flinders Island, under stones.

They are connected by a nearly complete series of intermediate forms (such as *L. distingendus*) with *Leptodius exaratus*.

* Nouv. Arch. Mus. Hist. Nat. ix. p. 223 (1873).

A complete revision of the genus would be necessary, based upon the comparative study of types and of a much larger series of specimens than the Museum at present possesses, in order to determine the real value of the characters ascribed to several of the species, which I think will be shown hereafter to be merely synonyms of earlier-described forms. (See on this question Kossmann, Zool. Ergeb. roth. Meer. pp. 32, 33, 1877.)

Two very small males obtained on the beach at Thursday Island (second collection, No. 167) are apparently intermediate in many characters between this genus and *Etisodes*, which they resemble in general appearance. The basal antennal joint enters the inner orbital hiatus, but the flagellum is just excluded from it, and the carapace is broader than in *Etisodes* and is shaped as in *Leptodius*; the frontal lobes are truncated, not sinuated as in *Leptodius lividus*; the anterior margin straight; there are five distinct acute antero-lateral marginal teeth; the carapace is slightly lobulated and granulated anteriorly, plane and smooth posteriorly; the carpus and palms of the chelipedes rugose; the ambulatory legs somewhat compressed. Length of carapace barely 4 lines.

47. Chlorodius niger (*Forskål*).

A single female of this very common Oriental species was obtained at Port Denison in 4 fms. (No. 111).

A specimen is in the British Museum from Port Jackson (*Cuming*).

C. niger ranges from the Red Sea and the Mascarene Islands eastward through the Indian Ocean and Malaysian archipelago to the islands of the Pacific (Samoa and Sandwich Islands).

Specimens are in the collection of the British Museum from Egypt (*Col. J. Burton*); the Gulf of Suez (*R. MacAndrew*); Red Sea, Dædalus Shoal (*Lt.-Col. Playfair*); El Tor (*Major MacDonald*); Seychelles (*Dr. E. P. Wright*); Ceylon, Galle (*Dr. W. Ondaatje*); Balabac Straits (*Smithsonian Institute, Wilkes Expedition*); New Guinea (*Dr. Bleeker's Coll.*); Philippine Islands, Guimaras (*Cuming*), designated *C. hirtipes* by Adams and White: Keeling or Cocos Islands (*Lt. Burnaby, R.N.*); Samoa Islands, Upolu (*Rev. S. J. Whitmee*), and Sandwich Islands (*W. H. Pease*).

Perhaps the *Chlorodius rufescens*, Targioni-Tozetti*, from Java, should be added to the synonyma of this species, from which it is distinguished by its author by the longer, more convex carapace, with more acute areolæ and marginal lateral teeth. MM. A. M.-Edwards and De Man have noticed considerable variation in the degree of acuteness of the antero-lateral marginal teeth and adjacent tubercles in *C. niger*†.

* 'Crostacei della Magenta,' p. 43, pl. iv. figs. 6–8, 10–12, 14, 18 (1877).

† *Vide* 'Notes from the Leyden Museum,' ii. p. 174 (1880).

48. Chlorodopsis granulatus. (Plate XXI. fig. A.)

? Pilodius granulatus, *Stimpson, Proc. Acad. Nat. Sci. Philad.* p. 34 (1858).

In this little species, which has never been figured, and is only known by Stimpson's brief diagnosis, the carapace is transverse, rather depressed, and very distinctly lobulated on its upper surface; the lobules or areolets granulated, covered with a close velvety pubescence, and separated one from another by naked interspaces; the antero-lateral margins have four distinct spiniform teeth, near to which are one or two minute spinules or granules, there being no tooth or spine at the outer orbital angle; the front is rather broad, projects but little, and is divided by a median incision into two rounded lobes, which are separated by a wider sinus from the outer frontal angles, which are in contact with the basal antennal joints; the orbital margins are entire. The male postabdomen is 5- or 6-jointed, two or three of the intermediate joints being coalescent. The basal antennal joint is robust, and its outer and distal angle enters the inner orbital hiatus, from which the flagellum is just excluded; the merus-joint of the outer maxillipedes is truncated at its distal end. Chelipedes moderately robust; merus or arm short, trigonous and unarmed; wrist and palm covered externally with small granules, wrist with one or sometimes two acute teeth on its inner margin; fingers as long or nearly as long as the palm, the mobile finger with two longitudinal series of acute granules on its upper margin; the fingers are regularly denticulated on their inner margins, and have between them scarcely any interspace when closed. The ambulatory legs are compressed, without spinules, but have a series of minute denticules on the upper margins of the merus-joints only. Colour (in spirit) light yellowish brown, fingers a much deeper brown; this coloration extends also over a great part of the inner and outer surfaces of the palm. The areolets of the carapace, pterygostomian regions, and legs are pubescent; the ambulatory legs clothed on their margins with longer hairs. Length of the largest male rather over 4 lines (9 millim.), greatest breadth 6 lines (nearly 13 millim.).

A specimen is in the collection from Port Denison, 4 fms. (No. 111), and four were collected on the beach at Port Molle (Nos. 95, 103). Stimpson's specimens were from Hong Kong.

In another male from Port Molle (No. 103) the carapace is nearly naked and the fingers black; this coloration forming also a broad black cincture covering the greater part of the inner and outer surface of the palms.

In a male in the second collection, obtained on the beach at Port Darwin (No. 176), which is probably no more than a variety of this species, the fingers are pinkish and scarcely differ in coloration from the rest of the palm, and have between them (when closed) a wider hiatus; the palm also is slenderer than in the other males I have examined. (See fig. *a'*.)

Chlorodopsis granulatus is evidently very nearly allied to *C. me-*

lanochirus, A. M.-Edwards*; but the spiniform teeth of the antero-lateral margins are much more prominent, the anterior margin of the merus of the chelipedes is not tuberculated, the ambulatory legs not spinulose. In a specimen from the Philippines (*Cuming*) that I refer to *C. melanochirus*, in the British Museum, the hands of the chelipedes in the male are much more robust, and the merus and two following joints of the ambulatory legs strongly spinulose, not only on the outer margins, but also on the posterior surface. From most of the other species of this genus it is distinguished either by the different coloration of the hands (fig. *a*) and the form of the antero-lateral marginal teeth, or the absence of spinules on the ambulatory legs.

Chlorodopsis areolatus (Milne-Edwards), a species originally described from New Holland, and referred to in the second part of this Report, is easily distinguishable by the form of the frontal lobes and antero-lateral marginal teeth.

49. Etisus lævimanus, *Randall.*

A male of this very common Oriental species was obtained at Port Molle, on the beach (No. 95).

Mr. Haswell records it from Holborn Island, near Port Denison.

The British-Museum collection includes specimens from Trinity Bay and Facing Island, Port Curtis (*J. Macgillivray*, H.M.S. 'Rattlesnake'); Moreton Bay (*purchased of Warwick*); Torres Straits (*J. B. Jukes*); Blackwood Bay (*J. B. Jukes*); Singapore (*purchased*); Fiji Islands, Vanua-Levu, Bau (*Rayner*, H.M.S. 'Herald'); New Hebrides (*J. Macgillivray*); Samoa Islands (*Rev. S. J. Whitmee*); also specimens without locality designated *E. macrodactylus*.

Dr. F. Hilgendorf† has already referred to the synonyma of *E. lævimanus*, which ranges in a westerly direction to the Red Sea and Mozambique.

50. Etisodes electra.

? Cancer electra, *Herbst, Naturg. Krabben u. Krebse*, iii. (2) p. 34, pl. xli. fig. 6 (1801).
? Cancer metis, *Herbst, t. c.* p. 36, pl. liv. fig. 3 (1801).
Etisus metis, *White, List Crust. Brit. Mus.* p. 126 (1847).
Etisodes frontalis, *Dana, Proc. Acad. Nat. Sci. Philad.* p. 77 (1852); *U.S. Expl. Exped.* xiii. *Cr.* i. p. 187, pl. ix. fig. 3 (1852); *Haswell, Cat. Austr. Crust.* p. 56 (1882).
Etisodes rugosus, *Lucas, Crustacés in Voyage au Pôle Sud*, iii. p. 33, pl. iv. fig. 2 (1853).
Chlorodius dentifrons, *Stimpson, Proc. Acad. Nat. Sci. Philad.* p. 34 (1858).

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* Nouv. Archiv. Mus. Hist. Nat. ix. p. 228, pl. viii. fig. 5 (1873).
† Monatsb. Akad. Wiss. Berlin, p. 791 (1878).

Etisodes sculptilis, *Heller, Sitz. Akad. Wien, Math.-nat. Klasse,* xliii. (i.) p. 333 (1861); *A. M.-Edwards, Nouv. Archiv. Mus. Hist. Nat.* ix. p. 236, pl. ix. fig. 2 (1873).

Chlorodius samoensis, *Miers, Ann. & Mag. Nat. Hist.* ser. 4, xvi. p. 341 (1875).

A small female was obtained on a coral-reef off Clairmont (No. 151).

Mr. Haswell records it from Holborn Island (as *E. frontalis*). In the British-Museum collection are specimens from the Gulf of Suez (*R. MacAndrew*); Philippines (*Cuming*); Samoa Islands (*Rev. S. J. Whitmee*, types of *Chlorodius samoensis*); Sandwich Islands (*W. H. Pease*); and others without special locality.

In this very variable species the front is usually 4-lobed (without including the inner orbital angle), but sometimes the submedian incisions are so shallow that the lateral lobes are scarcely defined; it also varies much in the distinctness of the areolation of the carapace and the granulation of the chelipedes. I have little doubt, however, that all the forms referred to in the synonymical citations given above are varieties of one widely distributed Indo-Pacific species.

51. Etisodes anaglyptus (*M.-Edw.*).

An adult female from Clairmont, obtained on a coral-reef (No. 151), belongs here.

This specimen certainly belongs to the same species as do two specimens in the British-Museum collection from the Philippine Islands (*Cuming*), referred by White to *E. anaglyptus*: but these all differ from Milne-Edwards's figure in the large illustrated edition of Cuvier* in having the frontal lobes divided by a deeper median fissure, and these lobes are themselves not merely truncated but also have the distal ends slightly convex, and the teeth of the antero-lateral margins are somewhat more conical and acute than in that figure. I may add that the lobules of the carapace have a few scattered punctulations, the tuberculation on the outer surface of the hands shows a disposition to arrangement in longitudinal series, and the black coloration of the fingers in the male extends over the inner and outer surface of the palms.

52. Menippe (Myomenippe) legouilloui, *A. M.-Edw.*

Several specimens are in the collection from Port Curtis, obtained either on the beach (Nos. 88, 96) or dredged at 7–11 fms. (No. 85). Length of the largest specimen about 1 inch 7 lines (40 millim.), greatest breadth about 2 in. 3 lines (57 millim.). In the smaller specimens the distinctions between the median and the rest of the frontal teeth are much less marked than in the full-sized example.

In the British-Museum collection there are, besides, only a specimen from Swan River, and another from the Malaysian seas,

* 'Règne Animal,' Crustacés, Atlas, pl. xi. fig. 4.

without definite locality, from the collection of the late Dr. Bleeker, and already referred to in my report on that collection.

53. Pilumnus vespertilio (*Fabr.*).

Five specimens were collected on the beach at Port Molle (Nos. 95, 103) (first collection). From the second collection are retained a female from Thursday-Island beach (No. 167), a male from a coral-reef at Clairmont (No. 151), a female from West Island, Prince of Wales Channel (No. 149), and a small female from Dundas Straits, N.W. Australia, 17 fms. (No. 161). In nearly all the hairs with which the carapace is clothed are of a cinereous colour. Hess mentions its occurrence at Sydney. It is said by Mr. Haswell to be common in Australia on coral-reefs.

A very large series of specimens of this widely distributed species is in the Museum collection, from the following localities:—Mauritius (*Old Collection*); Seychelles (*Dr. E. P. Wright*); Java (*coll. Dr. Bleeker*); Timor Laut (*H. O. Forbes*); N.W. coast of Australia, Nicol Bay (*Mr. du Boulay*); Madjica-Sima group (*H.M.S. 'Samarang,'* types of *P. ursulus*); Philippine Islands, Siquijor (*Cuming*); Cumberland Island, Sir C. Hardy's Island (*J. B. Jukes*); New Zealand (*Dr. A. Sinclair, R.N.*); Fiji Islands, Vanua Levu, Bau (*H.M.S. 'Herald'*); Samoa Islands, Upolu, &c. (*Rev. S. J. Whitmee*); New Hebrides (*J. Macgillivray*); besides others without definite or well-authenticated localities.

I have in my report on the late Dr. Bleeker's collection of Malaysian Crustacea given the principal references to the synonyma of this species.

54. Pilumnus pulcher. (Plate XXII. fig. A.)

In this species the carapace is regularly convex and somewhat orbiculate, the antero-lateral margins being as long as the postero-lateral and regularly arcuate; the upper surface of the body and legs is rather thinly clothed with very long fulvous hairs, beneath which the carapace is granulated; the median frontal lobes are very prominent, deflexed, and divided by a very narrow (or closed) median fissure; the orbital margins are denticulated; between each of the four principal spines of the antero-lateral margins are three or four scarcely smaller spinules. The pterygostomian regions are smooth; the sternum coarsely punctated. All the segments of the postabdomen distinct in both sexes. The basal antennal joints are robust and reach to the subfrontal processes; the merus-joints of the outer maxillipedes small and smooth. The chelipedes are moderately robust, and in the specimens examined nearly of equal size; arm short, trigonous, smooth, with a strong spine near the distal end of its upper margin; wrist granulated externally, with only a small spinule near the distal end of its inner margin; palm with three spines on its upper margin (see fig. *a*), its outer surface strongly tuberculated, the tubercles arranged in longitudinal series,

largest near the base of the lower (immobile) finger; fingers brown, the coloration not extending over the inner or outer surface of the hands, inner margins rather obscurely but regularly denticulated, apices acute; ambulatory legs rather long for a species of the genus. Length of the carapace of the largest male nearly 11 lines (23 millim.), breadth 1 inch $\frac{1}{2}$ line (27 millim.).

There is in Dr. Coppinger's collection a small female from Warrior Reef, Torres Straits, and a yet smaller male from Albany Island, 3–4 fms.; also in the second collection an adult male from Thursday Island, 3–4 fms. (No. 177). In the Museum collection is an adult male from Torres Straits (*Mr. McFarlane*). I cannot identify this species with any of the Australian forms described by Mr. Haswell.

From the *Pilumnus bleekeri*, recently described by me *, which inhabits New Guinea, and which this species somewhat resembles in external appearance, it is distinguished by the much narrower fissure of the front, different spinulation of the antero-lateral margins, and the three spines on the upper surface of the palms of the chelipedes.

In *Pilumnus vestitus*, Haswell (Cat. p. 68), from Port Jackson and Port Stephens, which has the carapace covered with stiff yellow hairs as in *P. pulcher*, the surface is not granulated, and the spinulation of the carapace and chelipedes is different.

55. Pilumnus rufopunctatus, *Stimpson.*

Three specimens (two males and a female) were obtained at Port Jackson, 5–7 fms. (No. 104).

Mr. Haswell records it from Port Stephens and Western Port.

It nearly resembles the following species (*P. lanatus*), which occurred with it, but is distinguished by the granulations of the chelipedes extending over the whole of the outer surface of the hand, and the tuberculation of the carapace, which, however, seems to be a variable character, &c.

Possibly the *P. rufopunctatus* of Stimpson is itself to be identified with *P. tomentosus* of Milne-Edwards. This is a point which cannot be satisfactorily determined from the very brief diagnosis of the latter author.

56. Pilumnus lanatus, *Latreille*? (Plate XXI. fig. B.)

As the *P. lanatus* has been only very briefly described, and the identification of this species must be regarded as uncertain, I append the following detailed description:—

In the specimens I thus designate the carapace is moderately convex, of the usual shape, and, as well as the legs, is covered with a short dense brown pubescence, which is absent in great measure from the inferior surface of the body and from the anterior and

* Ann. & Mag. Nat. Hist. ser. 5, v. p. 235 (1880).

lower surfaces of the hands; the front is moderately deflexed, and is divided by a median notch into two rounded lobes; the antero-lateral margins are somewhat shorter than the postero-lateral, with only the three posterior teeth distinct, these are small and spiniform. The orbits are tuberculated on their margins, but without any distinct spinules; the inner suborbital angle is rather prominent. All the postabdominal segments are distinct in both sexes. The basal antennal joint apparently does not reach to the front; the merus-joint of the outer maxillipedes is short and transverse; the chelipedes in the male have the merus-joint short and trigonous, with a tooth near the distal end of its upper margin; carpus and palm granulated on their outer surface, but the granules for the most part concealed by the pubescence; there is a small tuberculiform or subspiniform tooth on the inner margin of the carpus or wrist; the hand (for so small a species) is large, its inner surface naked, smooth, and polished, and the granulations usually obsolete on the naked part of the outer surface in the larger chelipede; the fingers are chocolate-brown, the coloration not extending over any part of the palm, and the upper finger has scarcely any traces of teeth on its inner margin. The ambulatory legs are closely pubescent. Length of the largest male in the collection a little over $4\frac{1}{2}$ lines (10 millim.), breadth about $6\frac{1}{2}$ lines (14 millim.); length of largest chelipede about $10\frac{1}{2}$ lines (22 millim.).

Ten specimens are in the collection, from Port Jackson, 5–7 fms. (No. 104).

Either the right or the left chelipede may be the larger in the male. Occasionally the granulations of the hands are distinct even upon the naked part of the outer surface; there are several females in the series of very small size, yet bearing ova.

There is in the British-Museum collection a specimen from Percy Island (*H.M.S.* '*Herald*'). Possibly also a small male from Tasmania (*R. Gunn*) is to be referred here.

Finally, there are in Dr. Coppinger's collection a series of very small specimens from Port Denison, 4 fms. (No. 111), of much paler colour than those collected at Port Jackson, and two from Port Curtis, 11 fms. (No. 87), which perhaps belong to this species.

This species bears some resemblance to *P. hirsutus*, Stimpson, which Mr. Haswell records from Port Jackson, but differs (in the adult at least) in the close brown pubescence, and in having a series of tubercles or small spines on the carpus (not merus) of the ambulatory legs. In the specimens from the Japanese or Corean seas referred to *P. hirsutus* in the Museum collection there is but a single spinule at the distal end of the carpus of these legs. *Pilumnus fissifrons*, Stimpson, from Port Jackson, differs in having the carapace distinctly areolated and the antero-lateral marginal teeth normally developed.

If our specimens should prove to belong to an undescribed species, I would propose for them the name of *P. humilis*.

57. Pilumnus semilanatus. (Plate XXII. fig. B.)

The carapace is not very convex; a few granules exist near the antero-lateral teeth; its anterior part (*i. e.* the frontal and post-frontal regions and parts adjacent to the antero-lateral margins) is clothed with longish hairs, which are altogether absent from the gastric, cardiac, and branchial regions, which are nearly plain and smooth; the cervical suture only is distinct in some specimens; the frontal lobes are scarcely defined by a median notch, and are very little prominent; the antero-lateral margins much shorter than the postero-lateral, and armed with three teeth, the first of which is blunt and is itself crenulated, the second dentiform, and the third very small; no tooth exists at the exterior angle of the orbit, but immediately behind it are sometimes one or two small granules; the orbital margins are rather obscurely denticulated; the pterygostomian regions nearly smooth; all the postabdominal segments are distinct; the basal antennal joint barely reaches to the subfrontal process; the merus-joint of the outer maxillipedes is nearly quadrate. The chelipedes are of moderate size; arm with a small spine near the distal end of its upper margin; wrist granulated externally, the granules inconspicuous, and with a small spine on its inner margin; palm also granulated above and externally, the granules large and showing a tendency to disposition in longitudinal series, and becoming more crowded toward the lower margin; fingers brownish, the coloration not extending over the palm; legs slender and proportionately rather long. Length of the largest perfect specimen rather over 4 lines (9 millim.), breadth 5 lines (nearly 11 millim.).

Three small specimens (a male and two females) are in the first collection, but unfortunately without definite locality; the label with particulars respecting habitat (if there existed any) was lost when the bottle (No. 123) came into my hands. In the second collection two males from Prince of Wales Channel, 7–9 fms.

Either the left or the right hand may be the larger.

There are in the collection of the British Museum a male and a female specimen preserved dry, and collected by Mr. J. Macgillivray (H.M.S. 'Rattlesnake') off Cape Capricorn, in 15 fathoms, on a muddy, sandy, and shelly bottom, that I refer to this species; also an adult male from Moreton Bay (purchased). The coloration of Dr. Coppinger's spirit-specimens is purplish, that of the dry examples reddish brown.

This species bears some slight resemblance to *P. monilifera*, Haswell, from Tasmania (*vide* Cat. p. 65, pl. i. fig. 3), which, however, has the carapace and limbs covered with a short close pubescence, and the front much more deeply incised, the carapace more granulated.

58. Pilumnus seminudus. (Plate XXI. fig. C.)

This species resembles the foregoing in having the gastric, cardiac, and branchial regions of the carapace smooth and naked; but it may

be at once distinguished by the following characters:—The carapace is broader in proportion to its length, and its anterior parts clothed with a close velvety pubescence, which also extends over the upper and outer surface of the wrist and palm of the chelipedes; the two posterior teeth of the antero-lateral margins are more distinctly spiniform, the basal antennal joint does not nearly reach to the subfrontal process; the granulations of the wrist and palm are much more inconspicuous, those of the outer surface of the palm appear, through the pubescence, to be arranged in four distinct longitudinal series (fig. *c*); the ambulatory legs are slenderer.

Colour (in spirit) purplish brown, hairs cinereous. Length of the largest specimen, a female, about $5\frac{1}{2}$ lines (nearly 12 millim.), breadth about $7\frac{1}{2}$ lines (16 millim.).

There is a male in the first collection from Port Denison, 4 fms. (No. 111), and a female in the second collection from Thursday Island, 4–5 fms. (No. 165).

Mr. Haswell has described a species (*Pilumnus inermis**) from Port Jackson which apparently resembles this and the preceding species in having the anterior parts only of the carapace clothed with hairs, which are long as in *P. semilanatus*. It differs, however, in the less distinctly toothed antero-lateral margins of the carapace, in the form of the front, which is entire, not notched, and in the disposition of the granules of the chelipedes, both from *P. semilanatus* and *P. seminudus*.

Pilumnus lævimanus, Dana†, is apparently allied to this and the foregoing species, but has the carapace almost wholly naked, and the larger hand rounded above and quite smooth, with only some faint traces of minute tubercles toward the base. It has been recorded from Borneo and New Caledonia.

In *Pilumnus nitidus*, A. M.-Edwards‡, from New Caledonia, which is another nearly allied species, the two anterior teeth of the antero-lateral margins of the carapace are obsolete.

59. Pilumnus cursor?

? Pilumnus cursor, *A. M.-Edwards, Nouv. Archiv. Mus. Hist. Nat.* ix. p. 244, pl. ix. fig. 4 (1873).

In the specimen I thus very doubtfully designate the carapace is nearly smooth, with the anterior portion moderately deflexed, antero-lateral margins much shorter than the postero-lateral, which are nearly straight and convergent posteriorly; both carapace and limbs are scantily clothed with very short hairs, among which a few longer hairs are interspersed; the frontal lobes are divided by a rather deep and wide median fissure; the antero-lateral margins are armed with three spines, besides a smaller but distinct spine at the exterior angle of the orbit. The basal antennal

* Proc. Linn. Soc. N. S. Wales, vi. p. 544 (1881); Catalogue, p. 70 (1882).
† Crust. U.S. Expl. Exp. xiii. p. 237, pl. xiii. fig. 11 (1852).
‡ Nouv. Arch. Mus. ix. p. 249, pl. x. fig. 2 (1873).

joint barely reaches to the subfrontal angle, but attains to a level with the apex of the inner suborbital lobe; the antennal flagella are much elongated. The chelipedes (in the single male examined) are rather slender and nearly equal; the arm has two spines at the distal end of its upper margin; the wrist is armed with several spines, the strongest one being on the inner margin; the palm has its upper margin and outer surface armed with small spines or spiniform tubercles disposed in longitudinal series; these are with difficulty discernible through the hairs covering this joint; fingers brown, and distinctly dentated on their inner margins. The ambulatory legs are elongated and slender, and have their upper and lower margins clothed with long hairs. Colour reddish (in spirit), with purplish markings. Length about $2\frac{1}{2}$ lines (5 millim.), breadth 3 lines (nearly 7 millim.); length of penultimate ambulatory limb nearly 6 lines (12 millim.).

The single specimen (a male) was obtained at Port Denison, 4 fms. (No. 111).

P. cursor, A. M.-Edwards, was founded on specimens from New Caledonia and the Samoa Islands; the description differs from the above in several minor particulars; but I have thought it better to regard the Australian example before me as identical with this species than to run the risk of unnecessarily adding to the synonyma. Mr. Haswell (Cat. p. 67) records it from Port Molle.

60. **Pilumnus labyrinthicus.** (Plate XXII. fig. C.)

In this curious form the surface of the carapace is everywhere covered with raised curved or sinuated ridges, which are separated by wide depressions; the body and legs are covered with a dense close brown pubescence; from most of the ridges and from the teeth of the antero-lateral margins of the carapace spring longer setæ, and the margins of the ambulatory legs are also fringed with longer hairs. The frontal lobes, which are scarcely separated as usual by a median notch, are rather broad, straight, and but little prominent; the antero-lateral margins are somewhat shorter than the postero-lateral, and are armed with three distinct teeth, that of the exterior orbital angle being obsolete. The orbital margin is somewhat thickened; the epistoma rather longer in proportion to its breadth than is usual. The basal antennal joint is short, scarcely attaining to the subfrontal process, and not nearly reaching to the apex of the very prominent lobe at the inner suborbital angle. The chelipedes are rather small and (like the carapace) are densely pubescent, besides being clothed with longer hairs; the outer surface of the wrist or carpus is tuberculated beneath the hairy coat; the palm is clothed externally with long dense hairs; the upper margin of the palm bears three distinct tubercles; the fingers are slaty coloured, dentated on their inner margins and acute at their apices. The ambulatory legs are densely hairy and of moderate length. Length of carapace nearly 4 lines (8 millim.), breadth about $4\frac{1}{2}$ lines (9 millim.).

One specimen (a male) was obtained at Port Molle, 14 fms. (No. 93); in the second collection are an adult female and two smaller specimens from Thursday Island, 3–5 fms. (Nos. 165, 177).

In many of its characters this species resembles *P. vespertilio*, but differs in the curious sculpture and less dense hairiness of the carapace, the prominent teeth of the antero-lateral margins, and the existence of distinct teeth on the upper margin of the palm (fig. *c*).

In the very remarkable sculpture of the carapace it somewhat resembles *P. vermiculatus*, A. M.-Edwards*, from New Caledonia; but in that species the vermiculations are much less numerous, the front is much deflexed and in a continuous line with the upper orbital margin, the teeth of the antero-lateral margins are much more obtuse, &c.

61. Pilumnus? pugilator?

? Actumnus pugilator, *A. M.-Edwards, Nouv. Arch. Mus. Hist. Nat.* ix. p. 195, pl. vii. fig. 1 (1873); *Haswell, Cat. Austr. Crust.* p. 72 (1882).

Here is referred, though with some hesitation, a fine male from Port Molle, 14 fms. (No. 93); also a male and two females in the British-Museum collection, preserved dry, and dredged by Mr. Macgillivray in 17 fathoms between Percy Island and the mainland, on a bottom consisting of coarse sand and shells. M. A. Milne-Edwards says that the regions of the carapace in his unique example (obtained at the island of Lifu) are distinct, whereas in the Australian examples I have before me scarcely any traces of the intervening depressions exist: moreover the form of the seriately disposed tubercles of the outer surface of the chelipedes is very peculiar and characteristic; these tubercles are separated, indeed, at their bases, but have their heads dilated and in contact with one another, and the heads are also armed (usually on one side only) with laterally projecting spinules. This disposition cannot be seen except under a lens of considerable power, and hence may have been unnoticed by M. A. Milne-Edwards.

Mr. Haswell gives Darnley Island as an additional Australian locality for this species.

62. Actumnus setifer.

Cancer (Pilumnus) setifer, *De Haan, Faun. Japon., Cr.* p. 50, pl. iii. fig. 3 (1835).

Actumnus tomentosus, *Dana, Proc. Ac. Nat. Sci. Phil.* p. 82 (1852); *U.S. Explor. Exped.* xiii. *Cr.* i. p. 243, pl. xiv. fig. 2 (1852); *A. M.-Edwards, Nouv. Arch. Mus. Hist. Nat.* i. p. 285 (1865); *Targioni-Tozetti, Crostacei del Viaggio della 'Magenta,'* p. 56, pl. ix. figs. 22–24, 26, 29 (1877); *Haswell, Cat. Austr. Crust.* p. 73 (1882).

Actumnus setifer, *A. M.-Edwards, t. c.* p. 287, pl. xv. fig. 5 (1865);

* Nouv. Arch. Mus. Hist. Nat. ix. p. 247, pl. ix. fig. 6 (1873).

Richters, Decapoda in Möbius' Beitr. zur Meeresfauna der Insel Mauritius und der Seychellen, p. 148 (1880).

In the collection is a male from Thursday Island, Torres Straits, 4–6 fms. (No. 130); a female from Port Denison, 4 fms. (No. 111); another from Percy Islands, Queensland, obtained at a depth not exceeding 5 fms. (No. 91); and three small specimens from Port Molle, 14 fms. (No. 93).

There are specimens in the British-Museum collection, that appear to be referable to this species, from Australia (*J. S. Bowerbank, Esq.*) and Sir C. Hardy's Island, dredged in 11 fms., on a bottom of coarse sand (*J. B. Jukes*); also from the Philippine Islands, Corregidor (*Cuming*), Fiji Islands, Totoya (*H.M.S. 'Herald'*), and New Hebrides (*J. Macgillivray*). A specimen from Shark Bay, W. Australia (*F. M. Rayner*, H.M.S. 'Herald') has a more coarsely pubescent carapace, and may be distinct.

Dana founded *A. tomentosus* upon a female from Tahiti or Upolu, in which the regions of the carapace were apparently somewhat less distinctly defined than in the specimens I have seen, and the granulations of the chelipedes more irregularly disposed.

A careful comparison of the descriptions above cited with the series in the Museum collection shows that certain of the characters which have been hitherto regarded as of specific value are by no means as constant as has been hitherto supposed.

In most of the Australian specimens I have seen the antero-lateral margins are 4-lobed, without any traces of spiniform teeth. Indications of these, however, exist in one specimen from Sir C. Hardy's Island, one out of two from the Philippines, and one from the New Hebrides in the Museum collection. In most of the specimens the carapace is clothed with a close velvety pubescence, and the upper margin of the chelipedes finely and closely granulated; but in the specimen from New Hebrides and one from the Philippines the pubescence is much more scanty and the granulations of the hands more acute, especially toward the upper margins.

The finger-tips of the species of this genus are generally scarcely to be described as excavated, but rather as obtuse, and the transition is effected to *Pilumnus* by almost insensible gradations through such species as *P. dehaani*, Miers*, which, indeed, may be merely the young of *A. setifer*, but differs not only in the acute antero-lateral marginal teeth and finger-tips, but also in the relatively shorter antero-lateral margins and entire obliteration of the regions of the carapace. A specimen nearly resembling *P. dehaani* is in Dr. Coppinger's collection, from Port Denison (No. 111); in it, however, the tubercles of the chelipedes are less conical and acute. In the small specimens I refer to *A. setifer*, from Port Molle, the regions of the carapace are fully as well defined as in the adult.

Dr. F. Richters (*t. c.* p. 148) records this species from the Mauritius: hence its range evidently extends throughout the Oriental region.

* Proc. Zool. Soc. p. 32 (1879).

CRYPTOCŒLOMA, gen. nov.

Carapace transverse, nearly flat above, with the antero-lateral margins much shorter than the postero-lateral, and forming with the apparent frontal margin (as viewed from above) an unbroken curve. Epistoma narrow-transverse. Palate or endostome with the longitudinal ridges nearly obsolete. Orbits transverse, with the margins subentire, not visible from above, but concealed beneath the projecting anterior margin of the carapace (see Plate XXIII. fig. A). Abdomen of female 7-jointed. The basal antennal joint reaches to the subfrontal process, and partly occupies the inner orbital hiatus. Outer maxillipedes with the merus-joint quadrate. Chelipedes subequal and of moderate size. Ambulatory legs compressed.

63. Cryptocœloma fimbriatum. (Plate XXIII. fig. A.)

Pilumnus fimbriatus, *M.-Edwards, Hist. Nat. Crust.* i. p. 416 (1834) ?; *Haswell, Cat. Austr. Crust.* p. 66, pl. i. fig. 4 (1882).

The carapace is transverse, its upper surface nearly flat; the antero-lateral margins are much shorter than the postero-lateral, and armed only with one or two inconspicuous granules or spinules; the postero-lateral margins are nearly straight, and slightly convergent posteriorly; the upper surface is obscurely granulated toward the lateral margins, and the cervical suture is faintly but distinctly defined. The apparent frontal margin is thin, entire, and forms a continuous and unbroken line with the antero-lateral margins, the orbits being altogether inferior. The margin thus formed is bordered with a thick fringe of very close-set cinereous hairs, beneath which are much longer hairs of a yellowish hue; the real front, however, is narrow-transverse, nearly vertically deflexed, with its anterior margin arcuated and having a small median notch. The eyes lie closely within the transverse inferior orbits, whose margins are nearly entire. The epistoma is narrow-transverse; very faint indications exist of longitudinal palatal ridges. All the segments of the postabdomen (which is rather narrow in the female) are distinct; the first segment only reaches to the bases of the fifth ambulatory legs. The antennules are transverse; the basal antennal joint just attains to the subfrontal lobe, and partly occupies the inner orbital hiatus. The ischium-joint of the rather broad outer maxillipedes is but little longer than the merus-joint, which is nearly quadrate, but shallow-excavate at its antero-internal angle at the place of articulation with the next joint; the exognath is narrow, straight, and just reaches to the distal end of the merus. The chelipedes are subequal, the merus trigonous and very short; the carpus granulated above, with a small tooth on its inner margin near the distal end, the outer margin fringed with very long fulvous hairs; similar hairs border the upper surface of the palm and mobile finger; the palm is granulated externally, and somewhat compressed; fingers rather obscurely granulated on their inner margins and acute at the apices, with

scarcely any intermarginal hiatus. The ambulatory legs are deficient except one fifth leg, which has the joints except the last compressed and bordered with long hairs; the upper margin of the merus is acute and obscurely crenulated; dactyl hairy, styliform, and short, with a small terminal claw. Colour (in spirit) light yellowish white. Length of carapace $3\frac{1}{2}$ lines ($6\frac{1}{2}$ millim.), breadth $4\frac{1}{2}$ lines (about $9\frac{1}{2}$ millim.).

The single female in the collection was obtained at Thursday Island, 4–5 fms. (No. 165).

There is also a female in the Museum collection obtained near Java (*H.M.S. 'Samarang'*).

As I have examined no male specimens of this curious species, and am ignorant of the position of the male verges, I do not venture to remove it from the vicinity of *Pilumnus*, in which genus it is retained by Mr. Haswell. There is, I think, no doubt of the specific identity of our example with the specimen figured in the 'Catalogue of Australian Crustacea,' though whether this be identical with the *P. fimbriatus* of M.-Edwards remains somewhat uncertain, on account of the brevity of the diagnosis of the latter author. This species certainly cannot be retained in *Pilumnus* as at present restricted; and I am inclined to think it should be removed from the Cancroidea to the Grapsoidea. I am, however, unable at present to indicate its exact affinities.

Mr. Haswell records it from Port Molle.

64. Pilumnopeus serratifrons (*Kinahan*).

Two specimens are in the collection from Port Jackson (No. 104).

The British Museum contains specimens from Port Jackson (*Cuming*), Port Phillip, Victoria (*Dr. J. R. Kinahan*), and the Australian seas, no definite locality (*Stutchbury*); also from New Zealand.

In my 'Catalogue of the New-Zealand Crustacea,' p. 21 (1876), I have already pointed out the possible identity of *Pilumnopeus crassimanus*, A. M.-Edwards, with *P. serratifrons*. I believe Mr. Haswell is right in regarding *Heteropanope australiensis*, Stimpson, as also synonymous with this species (Cat. p. 70).

65. Ozius guttatus, var. speciosus.

Ozius speciosus, *Hilgendorf, in Van der Decken's Reisen in Ost-Afrika*, iii. p. 74, pl. ii. fig. 1 (1869).

An adult female is in the collection from Flinders Island, North-east Australia. Mr. Haswell records it from Port Denison and Port Curtis.

To the same variety, as I think it must be designated, belongs an adult female in the British-Museum collection from Mauritius (*Lady Frances Cole*).

In the typical form of *Ozius guttatus*, as described and figured by Prof. Alph. Milne-Edwards in his Report on the Crustacean Fauna

of New Caledonia, the frontal teeth are much smaller and less prominent than in either Hilgendorf's figure of his *O. speciosus* or in the two specimens I have before me. As, however, Prof. A. Milne-Edwards had evidently a larger series for examination, and unites *O. guttatus* and *O. speciosus*, I do not venture to regard the two forms as distinct species.

Mr. Haswell records *O. guttatus* from Port Denison and Port Curtis.

This species has evidently a wide Oriental range, having been found in the Red Sea, at Zanzibar, Mauritius, Batavia, Torres Straits, and New Caledonia.

66. Neptunus pelagicus (*Linn.*).

Of this very common Oriental species two males are in the first collection from Port Curtis, 7 fms. (No. 88), and a male from Prince of Wales Channel, 3–4 fms., in the second collection. Specimens from the same locality are in the collection of the British Museum, obtained during the voyage of H.M.S. 'Rattlesnake' by Mr. Macgillivray, and also from the following Australian localities:—Port Jackson (*J. Macgillivray*); Sydney (*R. Schütte*); Swan River (*J. B. Jukes*); Shark Bay, W. Australia (*F. M. Rayner*, H.M.S. 'Herald'); also from New Zealand (*Sowerby*).

Besides the above, there are specimens in the Museum collection from the Red Sea (*Major J. Burton, Major MacDonald*); Gulf of Suez (*R. MacAndrew*); Zanzibar (*Dr. Kirk*); Pondicherry, Indian Ocean (*Gen. Hardwicke*); Penang (*Dr. Cantor*); Borneo (*Bleeker's coll.*); Celebes, Badjoa, &c. (*Dr. Bleeker's coll.*); Timor Laut (*H. O. Forbes*); Philippine Islands, Zebu (*Cuming*); Shanghai, Cheefoo (*Swinhoe*); Japan (*Mus. Leyden*); Honolulu (*H.M.S. 'Challenger'*); New Caledonia (*Macgillivray*); also others, without special indication of locality, from the collections of the 'Herald,' 'Rattlesnake,' and 'Samarang.'

The *Neptunus armatus*, A. Milne-Edwards, from Shark Bay, W. Australia*, of which the types, from the collection of H.M.S. 'Herald,' are in the British-Museum collection, is not referred to in Haswell's Catalogue. The specimens are of small size and probably not fully grown. Both carapace and limbs are slightly pubescent. The carapace is relatively somewhat narrower, and the antero-lateral teeth broader and less distant one from another than in *N. pelagicus* of about the same size, which otherwise this species very closely resembles.

67. Neptunus (Amphitrite) hastatoides (*Fabricius*).

Three examples are in Dr. Coppinger's second collection from Friday Island, Torres Straits, 10 fms. (No. 153), and a series of

* Arch. du Mus. d'Hist. Nat. x. p. 322, pl. 33. fig. 2 (1861).

smaller specimens from the Arafura Sea, 32–36 fms. (No. 160). In these latter the carapace is more convex and the spines at the postero-lateral angles of the carapace less developed. Although smaller, most of these are adult, since among them are females with ova.

There are besides in the British-Museum collection a female from the Indian Ocean (*Gen. Hardwicke*), several specimens from Hong Kong (*Dr. W. A. Harland*), and others, without definite locality, from the collections of H.M.SS. 'Herald' and 'Samarang.'

68. **Achelous granulatus** (*M.-Edw.*). (Plate XXIII. fig. B, var.)

A male of this common and widely distributed species is in the collection from Friday Island, Torres Straits, 13 fms. (No. 153). An enumeration of the localities whence the Museum possesses specimens is given in my Report on the Crustacea collected at Rodriguez by the naturalists of the British Transit-of-Venus Expedition*, to which should be added the following:—Seychelles (*Dr. E. Perceval Wright*), and Loyalty Islands, Lifu (*Rev. S. J. Whitmee*). It is recorded by Mr. Haswell from Palm Island (as *Amphitrite gladiator*).

A specimen from Prince of Wales Channel, 7 fms. (No. 169), differs from all the specimens of *A. granulatus* that I have examined in wanting the submedian spine of the posterior margin of the arm of the chelipedes (see Plate XXIII. fig. B); it may be designated var. *unispinosus*. The carapace is less granulated and the teeth of the antero-lateral margins less produced and spiniform than is usual in this species, and much less so than in the specimen from Friday Island.

69. **Thalamita admete** (*Herbst*).

Here are referred a small female from Port Molle, 5–12 fms. (No. 118), in the first collection, and another from Port Jackson, 5 fms., and five males (adult and young) found on a coral-reef at Clairmont Islands, N.E. coast of Australia (No. 151), in the second collection.

In the smaller examples of this species the minute rudimentary fourth tooth of the antero-lateral margins is occasionally deficient, as has been noted by A. Milne-Edwards in *Thalamita savignyi*.

Specimens are in the British-Museum collection from Conway Reef (*H.M.S. 'Herald'*), and also from the Fiji Islands (*H.M.S. 'Herald'*), Samoa Islands (*Rev. S. J. Whitmee*), and Sandwich Islands (*W. H. Pease*).

I regard the *Thalamita savignyi* of Prof. A. Milne-Edwards† as probably merely a variety of *Th. admete*, Herbst. Specimens apparently referable to this variety are in the British-Museum collection from the Gulf of Suez (*R. MacAndrew*) and Nicol Bay, N.W. Aus-

* Phil. Trans. clxviii. p. 488 (1879).

† Arch. du Mus. d'Hist. Nat. x. p. 357 (1861).

tralia (*M. du Boulay*). It is retained as a distinct species by Kossmann, who unites, however, under the designation *Th. prymna*, several of the species regarded as distinct by A. M.-Edwards (*vide* 'Zool. Reis. roth. Meer.' i. p. 17, 1877).

70. Thalamita sima, *M.-Edw.*

Small specimens are in the first collection from Port Molle, obtained between tide-marks (No. 103) and at 14 fms. (No. 93); and in the second collection, from Thursday Island, 3–4 fms. (Nos. 175, 177), 4–5 fms. (No. 165), and Port Darwin, obtained on the beach (No. 176).

In three very small specimens from Port Denison, Queensland, 4 fms. (No. 111), two of which are females with ova, the median lobes of the front are sinuated, and the front thus appears very obscurely 6-lobed. This is probably a peculiarity due to the small size of the specimens examined; the breadth of the carapace of one of the females is barely 4 lines (8½ millim.).

Of this species there are specimens in the British-Museum collection obtained between Cumberland Island and Point Slade and off Cape Capricorn (*J. Macgillivray*, H.M.S. 'Rattlesnake'); also from Moreton Bay and Port Jackson, and from Swan River (*J. B. Jukes*) and Shark Bay, W. Australia (*F. M. Rayner*, H.M.S. 'Herald'); also from New Zealand (*purchased*), and from the Indian Ocean (*General Hardwicke*), and Aku Sima, Japan (*Capt. H. C. St. John*); besides others without special indication of locality. A. Milne-Edwards records it from New Caledonia. The specimens from the Indian Ocean have the chelipedes more distinctly tuberculated than the other examples in the collection, but cannot, I think, on this account be separated, even as a distinct variety. From the *Thalamita chaptali*, noticed below, *T. sima* is distinguished not only by the much more acute lateral teeth of the carapace, the last of which is rather more prominent than the rest, but also by the smoother sternum and by the well-developed spines of the palms of the chelipedes. In *T. chaptali* the last of the antero-lateral teeth is (if any thing) smaller than the preceding tooth, and the palmar spines are nearly obsolete *.

* I may take this opportunity of noting that there is now in the collection of the British Museum a specimen from Ceylon (*E. W. H. Holdsworth*) apparently referable to this exceedingly rare *Thalamita*, originally described from the Red Sea, of which A. Milne-Edwards, when he published his Monograph of the Portunidæ (Arch. Mus. H. N. x. p. 360, 1861), wrote:—"Cette espèce paraît extrêmement rare, elle n'existe dans aucun Musée, soit de France, soit de Angleterre, soit de Hollande."

This example is an adult male, and agrees very well with M.-Edwards's description and Savigny's figure of *T. chaptali*, except as regards the chelipedes, the arm of which is strigose, and the wrist and palm and fingers very closely and distinctly granulated; the sternum is also finely sculptured. As some indications of granulations appear on the wrist of the left-hand chelipede in Savigny's figure, I do not venture to regard our specimen as distinct. Should future researches, however, demonstrate it to be so, it may be designated *T. holdsworthi*.

71. Thalamita stimpsonii, *A. M.-Edw.*

A male and female are in Dr. Coppinger's first collection from Port Molle, obtained, one on the beach (No. 95), and the other on the coral-reefs in that harbour. In the second collection is a female from Port Darwin, found on the beach (No. 176).

Specimens are in the British-Museum collection from the following Australian localities:—Port Curtis (*J. Macgillivray*, H.M.S. 'Rattlesnake'); Torres Straits (*J. B. Jukes*); and N. Australian coast (*Dr. J. R. Elsey*). There are also specimens from New Guinea and Amboina (*Dr. Bleeker's collection*), and Sunday Island (*J. B. Jukes*), besides others without special indication of locality.

Recorded by Mr. Haswell from Port Denison &c.

This may perhaps be a mere variety of the following species; but I do not venture to unite the two, since adult examples of *T. stimpsonii* seem to be distinguished from adult *T. crenata* not merely by the small fourth lateral marginal tooth, but also by the more transverse carapace and more granulated palms of the chelipedes.

72. Thalamita crenata, *Rüppell.*

An adult male is in the collection, from Port Molle, 14 fms. (No. 93).

There is also in the British-Museum collection a female from the Percy Islands, off the Queensland coast (*J. Macgillivray*, H.M.S. 'Rattlesnake'); a male from Torres Straits (*J. B. Jukes*); also from the Mauritius (*Lady F. Cole*); Natal (*F. M. Rayner*, H.M.S. 'Herald'); Timor Laut (*H. O. Forbes*); India, Karachi (*Karachi Museum*); Philippines (*Cuming*); the Samoa Islands (*Rev. S. J. Whitmee*); and others without special locality.

73. Goniosoma variegatum.

Portunus variegatus, *Fabricius, Entomologiæ Systematicæ Supplementum*, p. 364 (1798); *M.-Edwards, Hist. Nat. des Crustacés*, i. p. 465 (1834).

Cancer callianassa, *Herbst, Naturgesch. d. Krabben u. Krebse*, iii. Heft 2, p. 45, pl. liv. fig. 7 (1801).

Charybdis variegatus, *De Haan, Crust. in Siebold, Fauna Japonica*, pp. 10–42, pl. i. fig. 2 (1835).

Charybdis truncatus, *De Haan, t. c.* p. 65, pl. xviii. fig. 2 (1837), *nec Fabricius?*

Goniosoma callianassa, *A. Milne-Edwards, Archives du Muséum*, x. p. 382 (1861).

Goniosoma variegatum, *Miers, Proc. Zool. Soc.* p. 33 (1879).

I append a description of the species I suppose to be the *variegatus* of Fabricius, the synonyma of which are somewhat confused.

Carapace somewhat hexagonal in shape, with the postero-lateral angles rounded, pubescent, with the gastric and epibranchial ridges

smooth. Front 8-lobed, the lobes rounded, the median scarcely more prominent than the rest; the fissure between the median lobes and between the second and third lobes narrow-linear, those between the first and second and the third and fourth lobes triangulate. Antero-lateral margins armed with six teeth, whereof the first is subtruncated, the second to fifth triangulate and acute and directed forward, the sixth about twice as long as the preceding and laterally projecting. Chelipedes short and robust, arm or merus-joint with two strong spines near the distal end of its anterior margin, its posterior margin-convex, smooth, and angulated at a point midway from either extremity; wrist with a strong spine on its inner margin, and three smaller spines on its outer surface; palm with three spines, whereof one is situated at the proximal end close to the articulation with the wrist, and two on the upper surface; there is none above the base of the mobile finger; the carinæ of the upper and outer surface of the palm and the intervening parts are nearly smooth; the fingers are armed along their inner margins with triangulate teeth, which fit closely between one another when the fingers are closed, and which are themselves divided into several smaller teeth. The second to fourth ambulatory legs are slender, smooth; the penultimate joint of the fifth leg is not denticulated on its inferior margin; there is a spine at the distal end of the inferior margin of the merus-joint. Length of the carapace of the largest example about $\frac{3}{4}$ inch (19 millim.), breadth to base of lateral epibranchial spines about 1 inch (25 millim.).

A single specimen is in the second collection, a male from Port Darwin, 12 fms.

There are in the British-Museum collection several specimens of what is probably a mere variety of this species from Karachi (*Karachi Museum*), referred to by A. M.-Edwards as *G. callianassa*, which differ in having wider fissures between the median and the second and third teeth of the front. The first tooth of the antero-lateral margins is more distinctly truncated, and the last spine is shorter; also the spines of the arm, wrist, and palm of the chelipedes are much shorter, those of the upper surface of the palm being reduced to mere spinules, and the palm itself much more turgid, as in A. Milne-Edwards's description.

74. Goniosoma spiniferum. (Plate XXIII. fig. C.)

A single specimen is in the collection, obtained at Port Molle, between tide-marks (No. 103), which is evidently nearly allied to, and in M. A. Milne-Edwards's arrangement must be classed near to, *Goniosoma affine* (Dana), from Singapore. It differs, however, in the form of the frontal lobes, the median and submedian being broadly rounded and separated by narrow and not deep fissures. The fissure between the second and third lobe on each side is much deeper, and, although narrow, wider than those between the median and submedian lobes; the third lobe is itself narrower than these,

and is separated by a triangulate notch from the rounded fourth lobe or internal orbital angle. The basal joint of the antennæ is armed with a minutely granulated or denticulated ridge. The merus-joint of the anterior legs has four spines on its anterior margin, including a very small spinule at its antero-internal angle; the wrist has a strong spine on its inner margin and two small spinules on its outer surface; and the palm (as in *G. affine*) has five spines on its upper surface, the two anterior being very small. The fifth ambulatory legs have a strong spine, situated nearly at the distal end of the posterior margin of the merus-joint, and another on the posterior margin of the carpus; the flattened terminal joint has a small spinule at its distal extremity, but is otherwise unarmed.

From the preceding species, to which it is very nearly allied, *G. spiniferum* is distinguished by the greater transverse width of the carapace, the different form of the frontal lobes and of their intervening fissures and of the lateral teeth (see the figure). *Goniosoma hellerii*, A. M.-Edwards*, from New Caledonia, which resembles this species in having five spines on the upper surface of the palm, and the merus-joint of the fifth ambulatory legs armed with a strong distal spine, differs in the form of the carapace and frontal lobes, and has the penultimate joint of the fifth ambulatory legs denticulated on its posterior margin, &c.

75. **Nectocarcinus integrifrons** (*Latr.*).

There are three females of this species in Dr. Coppinger's collection, from Port Jackson, 0–7 fms. (Nos. 90, 104).

A specimen from the same locality is in the British-Museum from the collection of Mr. Cuming, and another dredged in the same harbour on the Sow and Pigs Bank, and presented by John Brazier, Esq.; also from Port Curtis (*H.M.S. 'Herald'*) and New Zealand, Bay of Islands (*Antarctic Expedition*); also from Oceania (*J. Macgillivray*, H.M.S. 'Rattlesnake'); and others without special locality.

Dr. Kinahan records it from Port Phillip, Victoria.

76. **Lupocyclus rotundatus**, *Adams & White.*

A female is in the collection from Port Molle, Queensland (first collection, No. 118), and another from Friday Island, 10 fms. (second collection, No. 153), which I think must be referred to this species, although the carapace is somewhat broader, more convex, and less distinctly granulated, and the frontal lobes more acute than in the adult specimen in the British-Museum collection from Balambangan, N. Borneo, on which presumably the description of Adams and White was founded.

As the Bornean example is a male, the distinctions between the

* Bull. Soc. Entom. de France, vii. p. 282 (1867).

two may be sexual. In two smaller examples from Balambangan (male and female), in the collection of the British Museum, the carapace is even more strongly granulated than in the adult, and this is not uncommon in the Portunidæ, *e. g.* in certain species of *Neptunus*.

M. de Man has quite recently recorded this species from the island of Amboina (*vide* Notes Mus. Leyden, v. p. 153, 1883).

77. Kraussia nitida, *Stimpson.*

Two small specimens (males) from Thursday Island, 4–5 fms. (No. 165), evidently belong here.

The distinctions between this species and *K. integra* (De Haan), are very slight, *K. nitida* differing, as Stimpson has noted, only in its somewhat narrower carapace, with more prominent and excavated frontal lobes; yet these distinctions are constant and easily perceived in the specimens I have examined.

Specimens referable to *K. integra* are in the Museum collection from the Philippines, Siquijor (*Cuming*), and also from the 'Samarang' collection without special locality.

78. Telphusa (Geotelphusa) crassa?

? Telphusa crassa, *A. M.-Edwards, Nouv. Arch. Mus. Hist. Nat.* v. p. 177, pl. ix. fig. 2 (1869).

A female in imperfect condition is in the collection, obtained at Thursday Island, Torres Straits (No. 125), that I refer, though with some doubt, to this species, as M.-Edwards's diagnosis is very short, and the specimen figured of much smaller size than the one I have before me. In this example there is a rudimentary epibranchial tooth, the sides of the anterior part of the carapace are faintly striated, shallow depressions indicate the anterior part of the cervical suture, and the chelipedes are more unequal than in the figure of M.-Edwards; there is a strong spine on the inner margin of the wrist, behind and below which is a second, much smaller tooth; the palm is nearly smooth; the fingers longer than the palm, with rather small denticulations and having between them, when closed, but a small interspace. Length of carapace about 1 inch 4 lines (35 millim.), greatest breadth 1 inch 4 lines (45 millim.).

There is a series of four specimens in the Museum collection, obtained by Mr. MacFarlane on one of the islands of Torres Straits, which are apparently referable here. The smaller agree, except in having some indications of a postfrontal crest, with the description of Milne-Edwards; but in the larger there exist much more distinct traces of the exterior orbital and lateral epibranchial teeth. In the male the fingers have between them, when closed, but a small interspace.

In two specimens from E. Australia, the smaller of which was received with fishes of H.M.S. 'Challenger' collection, the carapace is coarsely punctulated in front, perfectly smooth above, and less convex, with scarcely any traces of the depressions indicative of the cervical suture, or of the postfrontal crest and lateral teeth. These probably belong to a distinct species; the larger have been designated in MS. *T. leichardti*.

Specimens are in the British-Museum collection from the Philippines, R. Naga or Bicol (*Cuming*), which belong to *T. crassa* or to a closely allied species; in the male the larger chelipede has the mobile finger arcuated, both are rather strongly denticulated on their inner margins, and have between them, when closed, a wide interspace. These specimens were designated by White *T. obesa* (in manuscript); but this name has been applied by Prof. A. Milne-Edwards to a very nearly allied form from Zanzibar, which differs apparently only in having an even more distinct postfrontal crest, and yet more strongly arcuated and dentated fingers to the larger chelipede. If distinct, the Philippine examples may be designated *T. cumingii*.

It is worthy of note that although Milne-Edwards in his description says there exists no postfrontal crest in *T. crassa*, some indications of one appear in the figure. His species may, however, be identical with the one here designated *T. leichardti*, in which case the specimens I name *T. crassa* must receive a new specific appellation.

79. Gelasimus signatus, *Hess*.

A series of specimens is in the collection, of both sexes and of different sizes, from Port Curtis, some of which were collected at 7–11 fms. (No. 85).

These examples agree with the description and figure of Hess * in nearly every particular, and there can be no doubt of their identity with his species; but the margins of the somewhat triangular, flat, inferior face of the arm are minutely granulated, and can scarcely be described as furnished "with two rows of pearl-shaped tubercles," as stated by Hess, whose specimens were from Sydney.

There are in the collection of the British Museum specimens from Swan River (*Dring*), which I regard as belonging to this species. In the largest, the tooth or lobe of the middle of the inner margin of the lower finger, which is generally very characteristic of this species, is not developed. These specimens were referred by my predecessor, Mr. Adam White †, to *G. forceps*, M.-Edwards; but that author says that the larger chelipede in *G. forceps* is smooth, and the merus-joints of the ambulatory legs appear to be even broader and more dilated than in *G. signatus*.

No specimens had been seen by Mr. Haswell (who regarded the

* Archiv f. Naturgeschichte, p. 146, pl. vi. fig. 6 (1865).
† List Crust. Brit. Museum, p. 36 (1847).

locality given by Hess as doubtful) at the time of the publication of his Australian Catalogue.

80. **Ocypoda ceratophthalma** (*Pallas*).

An adult female was collected at Friday Island on the beach (No. 154). A specimen is in the Museum collection from Moreton Island, N. S. Wales. It is mentioned by Mr. Haswell as occurring at Cape Grenville, Palm Island, &c.

81. **Ocypoda kuhlii**, *De Haan*.

Five examples, males and females, were obtained on the beach at Thursday Island (No. 167).

An adult male from Shark Bay, W. Australia (*Rayner*, H.M.S. 'Herald'), and possibly a small mutilated example from Nicol Bay, N.W. Australia (*M. du Boulay*), belong here.

For remarks upon the specimens of this and the foregoing species in the Museum collection, I may refer to my recent memoir * on the genus. Both are widely distributed Oriental species. Since the publication of that paper, specimens have been received from Timor Laut (*H. O. Forbes*) of *O. ceratophthalma*.

Haswell (Catalogue, p. 95) mentions the occurrence on the tropical coasts of *O. cordimana*, a species of which I have seen no examples from Australia. Since he particularly mentions the absence of a stridulating ridge, there can be no doubt that his specimens belonged to this species and not to *O. kuhlii*.

82. **Macrophthalmus punctulatus.** (Plate XXV. fig. A.)

The carapace is nearly quadrate and relatively narrow, being but little broader than long; the cervical suture is in its posterior part very distinctly defined; the surface is uneven, punctulated, without spines or tubercles, but clothed with a few scattered hairs, which are more numerous, though not dense, on the postero-lateral parts of the branchial regions; the front is about one third of the total width of the anterior part of the carapace, with its anterior margin nearly straight; the antero-lateral margins are nearly straight and 3-toothed (the tooth at the external orbital angle included); the posterior lateral tooth is very small. The male postabdominal segments are all of them distinct. The first two joints of the slender antennal peduncle are contained within the large inner orbital hiatus; the epistome is transverse and very short, almost linear; the merus-joint of the outer maxillipedes is truncated at its distal end, and nearly as large as the preceding joint. The chelipedes (for so small a specimen) are well developed and are subequal; merus and carpus are smooth, without spines or tubercles, merus more or less hairy on its inner surface and upper margin; the palm is but little longer

* Ann. & Mag. Nat. Hist. ser. 5, x. p. 384, pl. xvii. fig. 8 (1882).

than its greatest vertical depth, which is at the articulation with the mobile finger, smooth and polished externally, its upper margin not carinated, its inner surface with a dense patch of hair; the lower margin of the immobile finger is in a straight line with the lower margin of the palm, its upper or inner margin is denticulated and has a strong tooth or lobe in the middle; the inner margin of the mobile finger has a smaller tooth near its base; the fingers, when closed, meet only toward their apices, having an hiatus between them, which is hollowed out into a deep, nearly semicircular cavity at the base of the immobile finger; this cavity is margined with hairs. The ambulatory legs are slender, somewhat compressed, and the margins somewhat thinly clothed with hair. Colour, in spirit, brownish. Length of carapace nearly 3 lines (6 millim.), breadth $3\frac{1}{2}$ lines (somewhat over 7 millim.); length of chelipede about $5\frac{1}{2}$ lines (over 11 millim.).

The single specimen (a male) was obtained at Port Jackson, 5–7 fms. (No. 104).

In the relatively narrow and quadrate carapace this species may be compared to such forms as *Macrophthalmus pacificus*, Dana *, to which species apparently belong specimens recently received from Timor Laut (*H. O. Forbes*), *Macrophthalmus bicarinatus*, Heller †, and *M. quadratus*, A. Milne-Edwards ‡.

M. pacificus and *M. bicarinatus* differ in their narrower front, &c.; *M. quadratus* has but two lateral marginal teeth, and no lobe or tooth on the inner margin of the immobile finger. *Macrophthalmus setosus*, an Australian species very briefly characterized by Milne-Edwards §, has, I suppose, a wider carapace. Specimens provisionally referred to this species in the British-Museum collection are certainly very distinct from our new species.

Macrophthalmus latifrons, Haswell ‖, from Port Phillip, has the carapace finely granulated, the immobile finger of the chelipedes deflexed, &c.

In many of its characters our species approaches *Euplax* (*Chænostoma*) *boscii* and *E. crassimanus*, Stimpson, in both of which there are but two teeth on the lateral margins of the carapace. In *Hemiplax hirtipes*, Heller, not to mention other distinctions, the fingers are only minutely denticulated on their inner margins. In the absence of catalogues or systematic lists of the species, it is with great hesitation that I venture to describe this as a new form among so many nearly allied species.

83. Euplax (Chænostoma) boscii (*Audouin*).

A small male is in the collection from Port Molle (No. 95).

This example in its coloration and all other characteristics coin-

* U.S. Exploring Expedition, Crust. xiii. p. 314, pl. xix. fig. 4 (1852).
† Reise der Novara, Crust. p. 36, pl. iv. fig. 2 (1865).
‡ Nouv. Archiv. Mus. Hist. Nat. ix. p. 280, pl. xii. fig. 6 (1873).
§ Ann. Sci. Nat. sér. 3, Zool. xviii. p. 159 (1852).
‖ Catalogue, p. 90 (1882).

cides with Dana's description and figure of a specimen from the Fijis (see Explor. Exp., Cr. xiii. p. 313, pl. xix. fig. 3). For remarks on the variation of the form of the chelipedes and for synonyma, I may refer to M. A. Milne-Edwards (Nouv. Archiv. Mus. Hist. Nat. ix. p. 281, 1873). This species apparently ranges from the coasts of Egypt southward to Natal, and eastward to the islands of the Pacific (*e. g.* New Caledonia, Fijis).

The specimen from Port Molle differs from Savigny's original figure of this species * in its much less distinctly granulated carapace; but specimens from Mozambique, received in the final consignment of H.M.S. 'Alert,' have the carapace as strongly granulated as in that figure.

CAMPTOPLAX, gen. nov.

Carapace trapezoidal, anteriorly deflexed, with the antero-lateral much shorter than the postero-lateral margins, which are straight and converge slightly to the posterior margin. Front of moderate width. Endostome or palate without longitudinal ridges. Post-abdomen (of the male) covering at base the whole width of the sternum, and touching the bases of the fifth ambulatory legs, 7-jointed. Eyes short, with thick peduncles. Antennules transversely plicated. Basal antennal joint short, not reaching to the subfrontal process. Outer maxillipede broad, not gaping, with the merus-joint transverse and much shorter than the ischium; the exognath slender, straight, and reaching to the outer distal angle of the merus. Chelipedes of moderate length. Ambulatory legs with the margins of the merus-joints cristated. The male verges arising directly from the base of the fifth ambulatory legs, and not contained in sternal channels.

This genus is apparently allied to *Pilumnoplax* and *Heteroplax*, Stimpson†, from both of which it is distinguished by the absence of palatal ridges and by the form of the basal antennal joint (Plate XXIV. fig. *a*), and also by the position of the male verges. In the latter character it would seem to be allied to the West-Indian genus *Frevillea*, A. M.-Edwards‡, which, however, differs apparently in the larger orbits and longer eye-peduncles, &c.

84. Camptoplax coppingeri. (Plate XXIV. fig. A.)

The carapace is subtrapezoidal, little broader than long, the anterior portion abruptly deflexed, and with three broad and shallow transverse depressions, whereof the anterior is situated on the deflexed postfrontal region, one in the middle line of the carapace, and one near to the posterior margin; the surface of the carapace is covered with a very close velvety overgrowth, amid which are numerous

* *Vide* Savigny, Crustacés de l'Egypte, pl. ii. fig. 1.
† Proc. Acad. Nat. Sci. Philad. pp. 93, 94 (1858).
‡ Bull. Mus. Comp. Zool. viii. p. 15 (1880).

small pits; this coating, which is apparently the natural covering of the species, is entirely absent from the transverse depressions, but covers in great part the ventral surface of the body and the legs. The front is rather less than one third the greatest width of the carapace and is notched in the middle; the very short antero-lateral margins are armed with three rather obscure teeth, whereof the first is situated at some distance from the orbit and the last at the angle formed by the junction of the antero-lateral with the postero-lateral margins, which is also the point at which the carapace is deflexed. The male postabdomen is as broad at base as the sternum and is 7-jointed; the first two joints shorter than the rest, the last subtriangulate with a rounded apex. The antennules are nearly transversely plicated; the basal antennal joint reaches nearly to the subfrontal process; the following joints are slender, the flagellum somewhat elongated. The maxillipedes (whose form is described above) have the fifth joints articulated with the merus at its antero-internal angle. The chelipedes, for so small a species, are rather robust; merus trigonous and more or less granulated; carpus (or wrist) and palm granulated on their upper and outer surfaces, the granulations disposed in reticulating lines, the intervening spaces or pits between which are smooth; the fingers are shorter than the palm, acute at the apices, and dentated and meeting along their inner margins. The ambulatory legs are of moderate length; the merus-joints are rather slender, trigonous, with the margins thin-edged or carinated, as are also the upper margins of the two following joints; the dactyli are slender and styliform. The male verges arise directly from the bases of the fifth ambulatory legs, and are not contained in sternal channels; they are rather broad at base and strongly recurved at the distal extremities. Colour (in spirit) whitish. The length of the largest example I have seen is barely $2\frac{1}{2}$ lines (5 millim.), and width less than 3 lines (6 millim.).

Two male specimens were collected in Prince of Wales Channel, at 7–9 fms. (No. 169).

85. Pseudorhombila vestita (*De Haan*), var. sexdentata, *Haswell*. (Plate XXIV. fig. B.)

?? Eucrate sexdentatus, *Haswell, Cat. Austr. Crust.* p. 86 (1882).

The carapace and legs are scantily pubescent; the carapace is little broader than long and is anteriorly deflexed; the front is about one third the greatest width of the carapace, with its anterior margin straight and entire, the antero-lateral margins shorter than the postero-lateral and armed with three teeth (including the tooth or lobe at the outer orbital angle); the posterior tooth is longest, spiniform, and projects laterally; the upper margins of the orbits are sinuated, the lower obscurely granulated, and there is a very wide hiatus on the inner side of the orbit. All of the postabdominal segments are distinct; the second and third segments, although laterally produced, do not reach quite to the bases of the fifth

ambulatory legs. The eye-peduncles are very short and thick, with very large corneæ; the antennules are transverse; the basal joint of the antennæ is slender, and although longer than the two following joints, does not reach to the subfrontal process; the ischium-joint of the outer maxillipedes is rather short and broad, but longer than the next joint and longitudinally sulcated; the merus is quadrate, the slender exognath reaches to the distal end of the merus. The chelipedes are subequal and of moderate size, and, as already stated, pubescent; the merus or arm is trigonous and has a tooth near the distal end of its upper margin; the carpus is armed with a strong spine on its inner surface; palm somewhat shorter than the fingers, the margins not cristated, the fingers regularly denticulated and meeting along their inner margins and acute at their apices, but without a tuft of hair at base. The ambulatory legs are slender, with the joints somewhat compressed and scantily pubescent; the margins of the penultimate and terminal joints of the last pair of legs are fringed with long hairs, but the terminal joint of the last pair of legs is styliform and not dilated. The bases of the male verges lie in wide open *canaliculi* of the sternum, and these organs (in the single specimen examined, which is probably not adult) are nearly straight. Colour (in spirit) whitish. Length of the carapace of the male $3\frac{1}{2}$ lines (nearly 8 millim.), breadth $4\frac{1}{2}$ lines (nearly 10 millim.); length of chelipede when fully extended nearly $\frac{1}{2}$ inch (12 millim.), of second ambulatory leg about $7\frac{1}{2}$ lines (16 millim.).

Two specimens, one a male and the other sterile, were collected in the Arafura Sea, 32–36 fms. (No. 160).

Haswell's types were from Holborn Island, Port Denison (20 fms.). As, in his brief description, he does not mention the pubescence of the carapace, and as his specimens differ in coloration, it is possible that ours are distinct; and if so, I would propose to designate them *P. haswelli*.

*Carcinoplax vestitus**, as figured by De Haan, differs in its somewhat narrower front, in the shorter, less prominent third antero-lateral spine, more quadrate carapace, less compressed chelipedes, and in the absence of long cilia from the terminal joint of the dactyli of the fifth ambulatory legs.

The distinctions between the genera *Carcinoplax*, *Eucrate*, and *Pilumnoplax* of Stimpson† are very slight, and a revision of the group is urgently needed. If, as is probable, all three genera should have to be united, the designation *Pseudorhombila* will, I think, take precedence, since De Haan's name *Eucrate* differs by a letter only from the earlier name *Eucratea*, and *Curtonotus* had previously been used in the Coleoptera.

* *Cancer* (*Curtonotus*) *vestitus*, De Haan, in Siebold, Fauna Japonica, Crust. p. 51, pl. v. fig. 3 (1835).

† Proc. Acad. Nat. Sci. Philad. p. 93 (1858).

86. **Pseudorhombila sulcatifrons** (*Stimpson*), var. **australiensis.** (Plate XXIV. fig. C.)

As this variety may prove to be specifically distinct, I subjoin the following description :—

As in *Heteroplax dentata*, Stimpson, the carapace is slightly transverse, anteriorly somewhat deflexed, posteriorly plane ; it attains its greatest width at the third lateral tooth. The front is about half the width of the carapace ; its anterior margin is faintly transversely sulcated, without any median fissure, and is straight ; there is, however, a small notch on each side close to the lateral angles, which thus are separated as small teeth. The antero-lateral margins of the carapace are much shorter than the postero-lateral and armed with four teeth (the outer orbital angle included) ; the third tooth is larger and more prominent than the others, the fourth the smallest ; there is a small median notch in the middle of the upper orbital margin ; slight transverse inequalities are apparent on the front of the gastric region and on the sides of the carapace near the lateral teeth. The postabdomen is triangulate, with the segments distinct, the penultimate and the last being the longest ; the second segment covers the whole width of the sternum and reaches to the bases of the fifth legs. The eyes are placed upon rather short thick pedicels. The antennules are rather long and transversely folded. The basal antennal joint is slender, and although longer than either of the following joints, does not reach to the frontal margin ; the flagellum is elongated. Scarcely any traces are visible of palatal ridges. The merus-joint of the maxillipedes is quadrate, and much shorter than the preceding ; the next joint is articulated with it at its antero-internal angle. The chelipedes are of nearly equal size ; merus trigonous, short, with a tooth near the distal end of its upper margin ; carpus smooth externally, with a spiniform tooth on its inner margin ; palm smooth externally, moderately convex ; fingers about as long as the palm, denticulated on their inner margins and having between them scarcely any interspace when closed. Ambulatory legs rather long, with the joints very slender, unarmed ; the last three with their margins somewhat scantily pubescent. Length of carapace nearly 3 lines (6 millim.), breadth nearly 4 lines (8 millim.) ; length of ambulatory leg of third pair about $6\frac{1}{2}$ lines (14 millim.).

The single specimen was obtained at Port Molle, 14 fms. (No. 93), and is apparently a female, although possessing an unusually narrow postabdomen. It differs from *Heteroplax dentata* and *H. transversa*, Stimpson*, in having the second tooth of the antero-lateral margins as long as the preceding, and also, it would appear, the shorter thicker eye-peduncles, and from the latter also in the narrower carapace. From the typical *P. sulcatifrons* (Stimpson), from Hong-Kong, it is distinguished only by the non-emarginate

* Proc. Acad. Nat. Sci. Philad. p. 94 (1858).

front and the absence of the woolly patch on the outer surface of the wrist.

Litocheira bispinosa, Kinahan, from Port Phillip*, which in many of its characters seems to be allied to *Pseudorhombila sulcatifrons*, is at once distinguished by having but a single spine behind the exterior orbital angle. Specimens are in the British-Museum collection from Port Curtis (*H.M.S.* '*Herald*'). Mr. Haswell, in his Catalogue, omits reference to this species, and to several others described by Kinahan.

The species described by Haswell as *Eucrate affinis* (Catalogue, p. 86) is, I think, identical with typical *P. sulcatifrons* (Stimpson). The type was from Holborn Island, near Port Denison (20 fms.).

I have quite recently described, under the name *P. sulcatifrons*, var. *atlantica*†, a specimen from Goree Island, Senegambia, which is scarcely distinguishable from Oriental examples of this species.

87. **Ceratoplax arcuata.** (Plate XXV. fig. B.)

Carapace longitudinally convex, scarcely broader than long and not wider behind than in the middle; the surface, when viewed under a lens of sufficient power, is seen to be covered with a very short pubescence; the sides are anteriorly arcuated, posteriorly parallel: the antero-lateral margins, which are acute, are divided by three slight notches, but can scarcely be described as dentated. The front forms with the antero-lateral margins a continuous curved line; it is somewhat deflexed, obscurely sinuated in the middle, with the exterior angles rounded off and not prominent, and has some longer hairs on its upper surface. The first two segments of the postabdomen in the male are very much shorter than the following, almost transversely linear in shape; the first segment, although laterally produced, does not reach to the bases of the fifth ambulatory legs. The eye-peduncles fit closely into the orbits (which are not deep) and have their anterior and upper margins acute and clothed with rather long hairs; the small corneæ are lateral, and are visible only in an inferior view. The epistoma is transversely linear; the antennules transversely plicated; the basal (or real second) antennal joint is slender, and does not nearly reach to the inferior margin of the front (see fig. *b*); the flagellum is of moderate length. There are no distinct palatal ridges. The outer maxillipedes are broad in proportion to their length; the ischium-joint little broader than long; the merus transverse, its extero-dorsal angle prominent. The chelipedes are moderately large, the right a little the larger, and the margins of the joints are for the most part clothed with rather long hairs; the carpus or wrist is angulated on its inner surface, with some long hairs at the angle; the palm is little longer than broad, and vertically deepest at the place of articulation with the mobile finger, its margins are not cristated, its outer surface smooth and

* Journ. Roy. Dublin Soc. i. p. 121, pl. iii. fig. 1 (1858).
† *Vide* Ann. & Mag. Nat. Hist. ser. 5, viii. p. 259 (1881).

naked except toward the margins, the lower margin is in a straight line with the lower margin of the immobile finger; the fingers are little shorter than the palm, acute at apices, and rather strongly denticulated along their inner margins. The ambulatory legs are slender and somewhat elongated, the dactyli styliform and straight, the margins (of the fifth pair especially) are clothed with longish hairs. The male verges are slender; their bases lie in narrow *canaliculi*, which are partially open above. Colour (in spirit) light yellowish. Length nearly 3 lines (6 millim.), breadth about 3 lines (6½ millim.).

The single male in the collection was obtained at Port Darwin, at a depth of 12 fms.

This species is distinguished from *Typhlocarcinus nudus* and *T. villosus*, Stimpson, by the form of the merus-joint of the outer maxillipedes and the acute anterior margins of the ocular peduncles, in which characters it agrees with *Ceratoplax*; in the form of the carapace and the structure of the antennæ it agrees better with *Typhlocarcinus*; but the very name of the latter genus prevents my assigning to it a species which has the organs of vision normally developed. Both this and the following species must, I think, be regarded as intermediate forms between *Typhlocarcinus* and *Ceratoplax*. The fifth ambulatory legs are much shorter than the preceding, as in *Asthenognathus inæquipes*, Stm.: but, unlike that species, the ambulatory legs are all very slender.

Rhizopa gracilipes, Stimpson, to which this species is nearly allied, is described as having minute eyes, a straight frontal margin, a strong median frontal suture, and glabrous chelæ.

88. **Ceratoplax? lævis.** (Plate XXV. fig. C.)

In this species the carapace is transverse, smooth and shining, longitudinally moderately convex, with only a very few punctulations; the front somewhat deflexed, more than one third the width of the carapace, entire, with an indistinct transverse line of scanty hairs across its upper surface; the antero-lateral margins are much shorter than the postero-lateral, acute, entire, and bordered with a few hairs; the postero-lateral margins are straight and convergent to the posterior margin. The orbital margins are entire, the orbits widest internally. The epistoma is very narrow-transverse. There are no longitudinal ridges on the endostome or palate. The postabdominal segments (in what appears to be the young female) are all of them distinct and all narrow except the last, which reaches to the bases of the fifth ambulatory legs. The eye-peduncles are thick and hairy above the corneæ, distinct, and black; the basal antennal joint, which is of moderate size, reaches to the subfrontal lobe (see fig. *c*). The ischium-joint of the outer maxillipedes is little longer than broad; the merus is transverse, with its antero-external angle prominent and rounded; there is no notch at the antero-internal angle. The chelipedes are subequal and of moderate size; the merus short and trigonous, with a strong tooth near the distal end of its upper

margin; the wrist smooth, its inner margin angulated, the angle with a fringe of long stiff hairs, its anterior margin and outer and upper surface have also some hairs; the palm is scarcely longer than vertically deep, its upper margin (and that of the mobile finger at base) closely fringed with long stiff hairs, and there are some shorter hairs on the lower margin; the outer surface is smooth, with a few scattered punctulations; the fingers are scarcely longer than the palm, denticulated on their inner margins and acute at their apices, with scarcely any intramarginal hiatus. The ambulatory legs are slender and somewhat hairy; the tarsi styliform, straight, and longer than the penultimate joints. Colour (in spirit) yellowish white. Length of carapace about $2\frac{1}{2}$ lines (5 millim.), breadth about 3 lines ($6\frac{1}{2}$ millim.).

The single specimen (a female) was dredged in the Arafura Sea, 32–36 fms. (No. 160).

From the preceding species (*C. arcuata*) this form is at once distinguished by the very differently shaped, smooth, and transverse carapace, longer basal antennal joint, &c.

Ceratoplax ciliata, Stimpson, the type of the genus, from the N. China Sea, has the body transversely semicylindrical, palm of chelipedes with depressed granulations on its outer surface, &c.

M. A. Milne-Edwards has described a genus and species (*Notonyx nitidus*) from New Caledonia*, which in many of its characters and in external appearance is very like *Ceratoplax? lævis*. It is described and figured, however, as having the carapace, eyes, and chelipedes entirely glabrous, there is apparently no tooth on the upper margin of the arm, and the dactyli of the ambulatory legs are carinated; the carapace is more quadrate, and the merus of the outer maxillipedes longer, not transverse, with the antero-external angle less prominent.

89. **Metopograpsus messor** (*Forskål*).

This common and widely distributed species is represented in the first collection by a male and female from Port Molle, obtained on the beach (No. 95), and two males from Port Curtis, 0–19 fms. (Nos. 85–92); and in the second collection by a small female from the beach at Thursday Island (No. 167) and a male and female from West Island, Prince of Wales Channel (No. 149). Specimens are in the British Museum from Facing Island, Port Curtis, obtained under stones at low water (*J. Macgillivray*, H.M.S. 'Rattlesnake'). The other Australian localities whence there are specimens in the Museum collection are:—Port Essington; Nicol Bay, N.W. Australia (*M. du Boulay*); Keppel Islands, from mud among mangrove-roots (*J. Macgillivray*); Moreton Bay (*purchased of Warwick*); and Shark Bay, W. Australia (*F. M. Rayner*, H.M.S. 'Herald').

Specimens also are in the collection of the Museum from the Gulf of Suez (*R. MacAndrew, Esq.*); Red Sea (*Major J. Burton*); Mada-

* Nouv. Archiv. Mus. Hist. Nat. ix. pp. 268, 269, pl. xii. fig. 3 (1872).

gascar (*Rev. Deans Cowan*); Mauritius (*Lady F. Cole*); Rodriguez (*G. Gulliver*); Indian Ocean, Celebes, Macassar, &c. (*coll. Dr. Bleeker*); Keeling Islands (*Lieut. Burnaby, R.N.*); various islands of the Fiji group (*H.M.S. 'Herald'*); Samoa Islands, Upolu (*Rev. S. J. Whitmee*); Sandwich Islands (*U.S. Exploring Expedition* and *W. H. Pease*); besides others without special or with insufficiently authenticated locality.

All the Australian examples I have seen, with one exception, appear to belong to the variety (as at most I consider it) described by Milne-Edwards as *intermedius*. One, however, of the specimens obtained at West Island (No. 149) must, on account of its coloration, be referred to the variety designated *thukujar* by Owen. The colour is not indicative of geographical races or subspecies, since of this latter variety I have examined specimens both from the Mauritius and the Sandwich Islands. Mr. Kingsley, in his recent "Synopsis of the Grapsidæ,"* does not regard these forms even as varieties, but unites them all under the one designation *M. messor*.

90. Chasmagnathus (Paragrapsus) lævis, *Dana*.

A male and female from Port Jackson, 0–7 fms. (one numbered 104), are referred here. They differ somewhat from the New-Zealand examples which I suppose belong to this species, in the British-Museum collection, in having but very few or no yellow spots on the surface of the carapace. In the New-Zealand examples (*Sowerby*), and others without definite locality in the Museum collection, both carapace and legs are plentifully mottled with yellow, and the front is perhaps a trifle more rounded at its lateral angles; but in other particulars the specimens are so nearly alike that I do not venture to regard them as belonging to distinct species.

Mr. Kingsley, in his "Synopsis of the Grapsidæ" above referred to (p. 222), has referred to the synonyms of this species. He unites the genera *Chasmagnathus* and *Paragrapsus*, and the distinctions between the two are certainly very slight; but it may be convenient to reserve the name *Paragrapsus* as a subgeneric designation, at least, for the species with less convex body and broader less deflexed front, which, in what may be regarded as the typical *Chasmagnathi* (e. g. *C. convexus* and *C. granulatus*), resembles that of *Helice tridens* in being strongly curved downward, with an arcuated anterior margin that does not project in the middle line over the antennulary region.

The range of *C. lævis*, as far as at present ascertained, is restricted to the north and south-eastern shores of Australia and the New-Zealand coasts.

91. Sesarma bidens, *De Haan*?

Port Curtis, 7–9 fms. (No. 85). Two specimens (males).

These examples are referred with little hesitation to *S. bidens*,

* Proc. Acad. Nat. Sci. Philad. p. 190 (1880).

although the beaded row of granules on the upper margin of the mobile finger is much less distinctly marked than in the specimen figured by De Haan.

Several species of this genus have been described agreeing with *S. bidens* in the bidentate lateral margins of the carapace, and in having two small oblique pectinated ridges on the upper surface of the palm. Of these, I regard *S. lividum* and *S. guttatum*, A. M.-Edwards *, as very doubtfully distinct.

S. dussumieri, M.-Edwards †, from Bombay, is very briefly characterized; but as the words "pouce subcrénelé" occur in the description, it may be that our specimens belong to it.

There are specimens that I refer, at least provisionally, to this species in the collection of the Museum from the Philippine Islands (*Cuming*, *Veitch*), Koo-Keang-San (*H.M.S. 'Samarang'*), Malaysian Seas without locality (*Dr. P. Bleeker*), and New Hebrides (*J. Macgillivray*). This latter example does not differ appreciably from the figure of *S. lividum*, A. M.-Edw., founded on a New-Caledonian example (*vide* N. Arch. Mus. H. N. ix. p. 303, pl. xvi. fig 2, 1873). This, as M. de Man has shown, is a species ranging throughout the Oriental region.

There are, besides, in the collection two very small specimens of a species of this genus belonging to the section having a carapace with entire lateral margins, which I will not venture to determine. The larger, a female, is from Port Jackson (0–5 fms.), the smaller, a male, from Port Curtis. It cannot, I think, be identified with *Sesarma erythrodactyla*, Hess, from Sydney ‡, in which the outer border of the mobile finger is ribbed, and the inner provided with two larger and several smaller teeth, &c.

92. Pinnotheres villosulus.

? Pinnotheres villosulus, *Guérin-Ménéville, Cr. in Voyage de la Coquille, Zool.* ii. p. 13 (1830); *Icon. Règne Animal, Cr.* p. 7, pl. iv. fig. 6 (1829–44).

? Pinnotheres villosus, *M.-Edwards, Ann. Sci. Nat.* sér. 3, *Zool.* xx. p. 218, pl. xi. fig. 8 (1853).

A female in Dr. Coppinger's collection, obtained at Warrior Reef, Torres Straits, agrees in nearly all particulars with M. Guérin's description based on specimens from Timor, and the maxillipede is almost exactly of the form delineated by Milne-Edwards. Guérin, however, describes the front as emarginate, whereas in the specimen I have before me it is triangulate and deflexed. In the slight outline sketch of the front and antennæ in his 'Iconographie' the rostrum appears, however, to be triangulate and bent down between the oblique antennules just as in Dr. Coppinger's specimen. I prefer, therefore, to refer the latter provisionally to Guérin-Ménéville's species rather than to incur the risk of adding needlessly to the

* N. Arch. Mus. Hist. Nat. v. Bulletin, pp. 25, 26 (1869).

† Ann. Sci. Nat. sér. 3, Zool. xx. p. 185 (1853).

‡ Archiv. Mus. Hist. Nat. p. 151, pl. vi. fig. 10 (1865).

synonyms by giving a new designation to a female example and one so doubtfully distinct. I should add, however, that in Dr. Coppinger's specimen there is scarcely any trace of pubescence on the middle part of the dorsal surface of the carapace, which is probably worn smooth by abrasion.

Two females received in the second collection from the same locality, 16 fms. (No. 137), are of larger size, uniformly tomentose, and the maxillipede (in one specimen examined) is less distinctly truncated at its distal end; they cannot, however, be regarded as belonging to a distinct species.

93. **Mycteris longicarpus**, *Latr.*

Port Molle; four specimens (two males and two females) were obtained on the beach (No. 95).

Specimens are in the British-Museum collection from Port Essington (*J. Gould*); Nicol Bay, N.W. Australia (*M. du Boulay*); Sydney; Port Jackson (*Antarctic Expedition*); Swan River (*Dring*); Tasmania (*R. Gunn*); and others without special locality. Also from New Guinea (*Rev. W. Y. Turner*); Billiton Island (*Marquis of Tweeddale*); Timor Laut (*H. O. Forbes*); Philippines, Negros (*Cuming*); and China seas (*Swinhoe*).

It is recorded by M. A. Milne-Edwards from New Caledonia.

I think it is very doubtful whether *Mycteris brevidactylus*, Stimpson *, from the Loo-choo Islands, can be regarded as distinct from this species.

Of the closely allied *Mycteris platycheles*, M.-Edwards, there are specimens in the British-Museum collection from Broken Bay (*J. Macgillivray*, H.M.S. 'Rattlesnake'), Tasmania (*Dring*, *Lieut. A. Smith*), and others without special indication of locality. With this latter species, *Mycteris subverrucatus* of White † and Kinahan ‡ is identical.

94. **Halicarcinus ovatus**, *Stimpson.*

Port Jackson, 0–7 fms. (No. 104). Four specimens, two males and two females.

In the 'Catalogue of New-Zealand Crustacea,' p. 49 (1876), I united this form with *Halicarcinus planatus* (Fabr.); but after a closer examination of a larger series of Australian specimens, I was inclined to think that it might after all be distinctly characterized by relatively larger and more closely approximated frontal lobes which are less hairy above. Accordingly the citation of this species was not included among the synonymical references to *H. planatus* in my notice of that species in the Report on the Crustacea of Kerguelen Island §.

* Proc. Acad. Nat. Sci. Philad. p. 99 (1858).
† List Crust. Brit. Mus. p. 34 (1847).
‡ Journ. Roy. Dublin Soc. i. p. 123 (1858).
§ Phil. Trans. clxviii. p. 201 (1879).

The differences in the form of the frontal lobes between the two species are, I may add, well shown in Targioni-Tozetti's figures (*vide* 'Crostacei della Magenta,' pp. 173, 176, pl. x. figs. 4 & 5, 1877).

All the specimens of this genus from the Magellan Straits, Falkland, Kerguelen, and Auckland Islands, and New Zealand in the collection of the Museum belong to *H. planatus*.

Of *H. ovatus* there are specimens in the collection of the British Museum from reefs on the N.E. coast of Australia (*Saumarez*) and Port Jackson (*Cuming*). I believe a very small specimen from King George's Sound, S.W. Australia (*F. M. Rayner*, H.M.S. 'Herald'), also belongs here. Mr. Haswell (Cat. p. 114) mentions the occurrence of *Halicarcinus planatus*, which he refers to the genus *Hymenosoma*, at Port Western; but as he merely quotes the description and synonyms as given in my New-Zealand Catalogue, I cannot be certain whether his specimens belong to *H. planatus* or *H. ovatus*.

95. **Leucosia ocellata**, *Bell.*

A female example was obtained in the Arafura Sea at 32–36 fms. (No. 160).

There are besides in the Museum collection only the specimen referred to by Bell as from "Eastern Australia," which was obtained at Cape Capricorn, on the Queensland coast (*J. Macgillivray*, H.M.S. 'Rattlesnake'), and one without special locality collected by F. M. Rayner (*H.M.S. 'Herald'*).

Mr. Haswell records this species from Keppel Bay, Queensland.

96. **Leucosia whitei.**

Leucosia whitei, *Bell, Trans. Linn. Soc.* xxi. p. 289, pl. xxxi. fig. 2 (1855); *Cat. Leucosiidæ Brit. Mus.* p. 9 (1855); *Haswell, Proc. Linn. Soc. N. S. Wales*, p. 45 (1880); *Cat. Austr. Crust.* p. 118 (1882).

? Leucosia cheverti, *Haswell, t. c.* p. 47, pl. v. fig. 2 (1880); *Catalogue*, p. 120 (1882), var.

A specimen from Flinders, Clairmont, N.E. Australia, dredged in 11 fms. (No. 108), in the first collection, belongs here, and one from Prince of Wales Channel, 9 fms. (No. 157), second collection. Mr. Haswell records it from Princess Charlotte Bay, Cape Grenville, and Brook Island.

I think that *L. cheverti*, Haswell, can scarcely be regarded as more than a variety of *L. whitei*; it is distinguished, according to its author, by the form of the front, which is obscurely (not distinctly) tridentate, and by the absence of granules on the hepatic regions. The hepatic granules, however, vary in number in the specimens (four in number) in the Museum collection, and in one are very obscurely marked. In two specimens from Shark Bay, W. Australia (*F. M. Rayner*, H.M.S. 'Herald'), which I think

must be referred to the variety *cheverti*, not only are the hepatic granules entirely absent, but also the front has not the faintest trace of trilobation.

97. **Leucosia craniolaris**, var. **lævimana**. (PLATE XXVI. fig. A.)

I propose thus to designate, at least provisionally, a female specimen obtained in 10 fms. at Friday Island, Torres Straits (No. 153), which is distinguished from the very numerous examples of *L. craniolaris* in the Museum collection by the absence of a series of granules on the inner margin of the palms of the chelipedes. The carapace is narrower than is usual in *L. craniolaris*, very polished and shining, and has two white spots on either side of the gastric region. The notch in the anterior margin of the thoracic sinus is less distinct than is usual in *L. craniolaris*. A second specimen from Torres Straits, in the Museum collection, resembles Dr. Coppinger's example in its narrow rhomboidal carapace, but the inner margins of the chelipedes are distinctly granulated.

Specimens of *Leucosia craniolaris* are in the British Museum from Tranquebar (*Old Collection*); Ceylon (*E. W. H. Holdsworth*); Penang (*Dr. Cantor*); Borneo and Chinese seas (*coll. H.M.S. 'Samarang'*); Formosa (*Matthew Dickson*); Hong-Kong (*Dr. W. A. Harland* and *W. Stimpson*).

98. **Myra carinata**, *Bell.*

Flinders, Clairmont, N.E. Australia. A fine male dredged in 11 fms. (No. 108) seems to be referable to this species, which has been recorded by Mr. Haswell * from Cape Grenville.

Specimens are in the British-Museum collection from the Celebes, Macassar (*coll. Dr. Bleeker*), Philippines (*Cuming*), and Hong-Kong (*Dr. W. A. Harland*).

These differ slightly among themselves in certain points, as *e. g.* the relative narrowness of the carapace, prominence of the inner and upper orbital angles, and length of the posterior spines, characters that may be of some importance; but large series are needed to determine with certainty the distinctions between the very variable species of this genus.

99. **Myra affinis**, *Bell.*

Four specimens are referred here from Port Denison, 4 fms. (Nos. 111, 122), first collection, and a larger female from Thursday Island, 3–4 fms., second collection (No. 177), which, like the examples mentioned by Mr. Haswell from Cape Grenville and New South Wales, have a more or less distinct median longitudinal carina on the carapace.

Of *M. affinis* there are specimens in the British-Museum collection from the Philippine Islands, Masbate, Zebu (*Cuming*), and from the Eastern seas (*H.M.S. 'Samarang'*) without special locality.

* 'Catalogue,' p. 121 (1882).

The larger specimen closely resembles the specimens referred to *M. affinis* in the Museum collection, and scarcely differs from *M. mammillaris* except in the (relatively) somewhat longer, more acute median spine of the posterior margin, and shorter chelipedes; and I think it probable that a larger series would demonstrate the necessity of uniting the two species. The younger examples may be distinguished from those referred to *M. australis* by their narrower carapace, and the longer, more acute, and non-recurved posterior marginal spines.

100. **Myra mammillaris**, *Bell.*

An adult male is in the collection from Port Denison, 4 fms. (No. 111).

There are in the Museum collection specimens from Adelaide, S. Australia (purchased), and others without special locality.

101. **Myra australis**, *Haswell?*

Myra mammillaris (young), *Miers, Trans. Linn. Soc.* ser 2, *Zool.* i. p. 239, pl. xxxviii. figs. 25–27 (1877).

? Myra australis, *Haswell, Proc. Linn. Soc. N. S. W.* iv. p. 50, pl. v. fig. 3 (1880); *Catalogue*, p. 122 (1882).

Three specimens are referred doubtfully to this form from Port Molle, 14 fms. (No. 93), and one from Port Denison, 4 fms. (No. 122) (first collection); also a male from Thursday Island, 3–4 fms. (No. 177), two females from the same locality, 4–5 fms. (No. 165), (to the back of one of which is attached a fine specimen of a species of *Acetabularia*), and two males from Prince of Wales Channel, obtained at 7 fms. (No. 142) and 9 fms. (No. 157).

In some of the specimens I have examined the carapace is much more evenly granulated than in others, and they also differ in the more or less recurved posterior median spine and the greater or lesser dilatation of the intestinal region; in some females the post-abdomen is comparatively narrow, whereas in others it covers the whole of the sternal surface. Although some of the larger specimens approach nearly in their characters to *M. mammillaris*, yet, as all may be distinguished by their more orbiculate carapace, more acutely-angulated pterygostomian regions, the more or less recurved posterior median spine, and relatively shorter chelipedes, I prefer to adopt for them, at least provisionally, Mr. Haswell's specific name. I should add, however, that in Mr. Haswell's figure the male post-abdomen is represented as shorter than in our specimens, with the sides somewhat constricted at base of the terminal segment.

There are specimens from Shark Bay, West Australia, in the Museum collection (*H.M.S.* '*Herald*') which probably belong here, but in one (a female) the granulations of the carapace are very indistinct.

102. Phlyxia crassipes, *Bell.*

Of this species, which is said by Mr. Haswell to be extremely common at Port Jackson, a very small male was dredged at that locality in 5–7 fms. (No. 104), and another, larger, male in 0–5 fms. (second collection).

Besides the specimens from Port Jackson (*Cuming* and *J. Macgillivray*) mentioned by Bell, the Museum possesses one from Flinders Island, Bass Straits (*F. M. Rayner*, H.M.S. 'Herald'), and others, without special locality, from Dr. Bowerbank and W. A. Miles, Esq.

It is of interest to note that there are two other species of this genus recorded from Port Jackson, and agreeing with *Phlyxia crassipes* in possessing a 4-lobed front, which yet appear to be distinct; they are *Phlyxia quadridentata**, a species recorded from Port Jackson by Stimpson, and *Phlyxia ramsayi*, Haswell (*t. c.* p. 127).

103. Phlyxia lambriformis.

Phlyxia lambriformis, *Bell, Trans. Linn. Soc.* xxi. p. 304, pl. xxxiv. fig. 2 (1855); *Cat. Leucos. Brit. Mus.* p. 17 (1855); *Haswell, Cat. Austr. Crust.* p. 124 (1882).

Phlyxia petleyi, *Haswell, t. c.* p. 125, pl. iii. fig. 3 (1882).

A female was received with Dr. Coppinger's second collection from Prince of Wales Channel, 9 fms. (No. 157), and four males and a female from Port Darwin, 7–12 fms. (mostly No. 173).

There are, besides, two specimens in the British Museum from the 'Rattlesnake' collection, obtained at Bass Straits, and one from the same collection without special locality.

It is recorded by Mr. Haswell from Princess Charlotte Bay and Holborn Island near Port Denison, and also from Port Molle, Whitsunday Passage (as *P. petleyi*).

After a careful comparison of Mr. Haswell's description and figure of *P. petleyi* in the Catalogue of Australian Stalk- and Sessile-eyed Crustacea with Prof. Bell's types of *P. lambriformis* in the Museum collection, I am unable to regard the two as distinct species. Prof. Bell's figure is from an adult male in which the rostrum, tubercles of the carapace, and teeth of the antero-lateral margins are all very prominent, whereas Mr. Haswell's description was based upon a female and smaller male. Moreover, Bell's short description is misleading in one or two particulars—*e. g.* he describes the carapace as carinated, whereas the keel in question extends only over the depressed postfrontal portion of the carapace, from the back of the rostrum to the gastric region.

104. Nursia sinuata, *Miers.*

Of this species three specimens, a male and two females, are in the collection (No. 123), but, unfortunately, the exact locality is not

* *Ebalia quadridentata*, Gray, Zool. Miscell. ii. p. 40 (1831).

known. In the smallest (immature) female the postabdomen is relatively narrow, and does not, as in the adult, cover the whole of the sternal surface.

Nursia abbreviata, Bell, must be added to the list of the Australian species of this family, since the specimens in the British-Museum collection are from Moreton Bay, and were purchased with the types of *N. sinuata* from the same locality.

105. **Nursilia dentata**, *Bell.*

In the first collection is a female from Flinders, Clairmont, N.E. Australia, 11 fms. (No. 108), and in the second an adult female and two smaller males from the Arafura Sea, 32–36 fms. (No. 160). These do not differ from the type (a female, without special indication of locality, from the 'Samarang' collection) in the British Museum, except in the somewhat more prominent spines and marginal teeth of the carapace.

Mr. Haswell mentions the occurrence of this species at the Fitzroy Islands.

There is in the collection of the British Museum a female from the Fiji Islands, Matuka (*H.M.S. 'Herald'*), in which the small spines or tubercles of the gastric, hepatic, and branchial regions are nearly obliterated, as are also the lobes or teeth of the lateral margins.

In the final consignment of the collections of H.M.S. 'Alert' is a specimen from the Seychelles. Hence this species is evidently distributed throughout the Oriental region.

106. **Iphiculus spongiosus**, *Adams & White.*

A small male was dredged in the Arafura Sea, 32–36 fms. (No. 160), which agrees with the larger specimens from the Philippine Islands, Corregidor (*Cuming*), and another specimen without definite locality, from the 'Samarang' collection, in the British Museum.

Prof. Bell is certainly right in classing this genus with the Leucosiidæ, and in stating that it has no near affinities with the Parthenopidæ, as supposed by Adams and White.

107. **Arcania pulcherrima**, *Haswell.*

Arcania septemspinosa, *Bell, Trans. Linn. Soc.* xxi. p. 310, pl. xxxiv. fig. 7 (1855); *Cat. Leucos. Brit. Mus.* p. 21 (1855).
Arcania pulcherrima, *Haswell, Proc. Linn. Soc. N. S. Wales*, iv. p. 58, pl. vi. fig. 4 (1880); *Cat. Austr. Crust.* p. 131 (1882).

An adult female from Prince of Wales Channel, 9 fms. (No. 157), and a smaller male from the Arafura Sea, 32–36 fms. (No. 160), are referred here.

A comparison of Mr. Haswell's description and figure of *A. pul-*

cherrima, from Darnley Island, with Bell's type of *A. septemspinosa* (which is registered as from Borneo, and is not, as Bell states, of unknown locality) in the Museum collection establishes the identity of the two species. There is in reality no median posterior marginal spine in *A. septemspinosa*, the one shown in the figure (and made much too prominent) being the posterior spine or tubercle of the median longitudinal dorsal series, which is situated above the posterior margin. Hence the name *septemspinosa* is inappropriate for this species; and as, moreover, the same specific description is used in the genus *Iphis*, which, as I have already noticed*, is scarcely distinct from *Arcania*, I prefer to retain Mr. Haswell's specific name.

108. **Lithadia? sculpta**, *Haswell.*

A male of this very interesting little species was dredged in the Arafura Sea at 32–36 fms. (No. 160), where so many other remarkable species were obtained. A dried female is in the British Museum, from the collection of H.M.S. 'Samarang,' but without any special indication of locality. Mr. Haswell's types were from the Fitzroy Islands.

109. **Oreophorus reticulatus**, *Adams & White.*

An adult female from Thursday Island, 4–5 fms. (No. 165), and a smaller specimen of the same sex from Friday Island, 10 fms. (No. 153), seem to belong to this species.

The specimens in the British-Museum collection are from the Straits of Sunda (*H.M.S. 'Samarang'*) and Philippines (*Cuming*).

From *O. frontalis* this variable species may, it would appear, always be distinguished by its very much less prominent and non-emarginate front.

110. **Oreophorus frontalis.** (Plate XXVI. fig. B.)

The carapace is transverse and laterally produced at the branchial regions over the bases of the ambulatory legs; the margins of the carapace at this part form a distinct angle with the antero-lateral margins. The front is very prominent, and divided by a very shallow median notch into two rounded lobes; it is uniformly granulated above. The surface of the carapace (seen under a sufficient magnifying-power) is granulated, the granules most numerous towards the posterior and postero-lateral margins, and, where not granulated, it is closely and finely punctulated; the hepatic regions are separated from the adjoining parts by a well-defined semicircular suture, the branchial regions near to the middle line are strongly convex. There is a prominent triangular acute lobe on the pterygostomian regions. All the postabdominal segments appear to be distinct, the postabdomen, sternal surface, and inferior parts of the carapace generally being granulated; a more prominent tubercle

* *Vide* Ann. & Mag. Nat. Hist. ser. 5, v. p. 317 (1880).

exists on the fifth segment; the terminal segment is much narrower than the preceding, acute and constricted at base. The eyes are placed in very small orbits; the antennules lie in oblique fossettes; the bases of the antennæ are almost completely fused with the surrounding parts of the carapace (in the single specimen examined), and scarcely any trace remains of a flagellum. The merus-joint of the outer maxillipedes is triangulate, and shorter than the preceding; the exognath has its outer margin straight, and, although robust, is narrower than the ischium of the endognath, it does not reach to the extremity of the merus-joint. The chelipedes are subequal and of moderate length, with the joints granulated, but otherwise unarmed; merus trigonous; carpus very short; palm externally rather convex, with an angulated prominence on its inner surface, shorter than the fingers, which externally are longitudinally sulcated, meet along their inner margins when closed (these margins being minutely denticulated), and are concave internally toward and somewhat incurved at the tips. The ambulatory legs (which are partially concealed beneath the carapace) have all the joints strongly granulated; the dactyle slender, and longer than the preceding joints. The colour (in spirit) of the single specimen is nearly white. Length not quite 3 lines (6 millim.), breadth nearly 4 lines (8 millim.).

The single specimen was collected at Port Molle, 5–12 fms. (No. 118), and is a male, the first, I believe, recorded of this genus.

The very prominent front seems to distinguish this species from all hitherto recorded, except *Oreophorus petræus**, from New Caledonia, which is only distinguished by the much shorter, more dilated immobile fingers of the chelipedes, and by having the lateral margins of the carapace marked by three closed fissures, whereas in *O. frontalis* there are but two, which meet behind and circumscribe the hepatic region. There are two specimens that probably belong to *O. petræus* in the collection of the Museum, from Shark Bay, W. Australia (*F. M. Rayner*, H.M.S. 'Herald'). These forms are certainly intermediate between *Oreophorus* and *Tlos*, but seem to me to have more affinity with the former genus, since in *Tlos muriger*, Ad. & White (the typical species), the front is not at all prominent, and its margin, with the antero-lateral margins of the carapace, is dorsally reflexed.

In the elongated fingers it resembles *O. rugosus*, Stimpson, as figured by A. Milne-Edwards †, from the Loochoo Islands and Cochin China, which, however, has a much less prominent front and the carapace more coarsely punctulated, and is without the hepatic sulcus. Mr. Haswell (Cat. p. 130) records *O. rugosus* from Port Denison; but as his description is merely abbreviated from that of Milne-Edwards, I am unable to say whether the specimens there collected afford any basis for uniting *O. rugosus* and *O. frontalis*.

* *Tlos petræus*, A. M.-Edwards, Nouv. Arch. Mus. Hist. Nat. x. p. 51, pl. iii. fig. 1 (1874).

† Ann. Soc. Entom. France, sér. 4, v. p. 152, pl. vi. fig. 3 (1865).

111. Matuta victrix (*Fabr.*).

Two males are in the collection from the Percy Islands, Queensland, 0–5 fms. (No. 91).

Of this common species specimens are in the British-Museum collection from Torres Straits (*J. B. Jukes*), and Shark Bay (*F. M. Rayner*, H.M.S. 'Herald'). Also from the Red Sea, Zanzibar (*Dr. Kirk*); Pondicherry, Indian Ocean (*Gen. Hardwicke*); Madras (*India Mus. coll.*); Ceylon (*E. W. H. Holdsworth*); Penang (*India Mus. coll.*); Celebes, Macassar, Bali, and Batjan (*coll. Dr. Bleeker*); Borneo (*Admiralty*).

Of the very distinct variety *crebrepunctata*, Miers, there are specimens from Japan (*Leyden coll.*), Fiji Islands, Vanua Levu (*F. M. Rayner*), and Mallicollo, New Hebrides (*W. Wykeham Perry*).

112. Matuta inermis. (Plate XXVI. fig. C.)

I must, at least provisionally, thus designate a female from Albany Island, 3–4 fms., two small males from Thursday Island, 3–4 fms. (No. 177), three from Prince of Wales Channel, 7 fms. (No. 169), and four collected in Torres Straits at 10 fms. (No. 158), also four specimens (of which three are very small, and the fourth, a male, but little larger) from the 'Herald' collection (*F. M. Rayner*), without definite locality, in the British-Museum collection. In all of these specimens the carapace is rather longer than broad, proportionately longer and narrower than in other species of the genus; the tubercles of the carapace are arranged nearly as in *M. banksii*, which this species further resembles in having the anterior half of the carapace coarsely and distinctly granulated. The long lateral marginal spines, however, which exist in every other species of *Matuta* are in *M. inermis* obsolete and represented merely by a small tubercle. The interrupted ridge on the middle of the outer surface of the palm is parallel with the inferior margin, and the outer surface of the mobile finger presents scarcely any trace of a longitudinal ridge (fig. *c*). Hence this species is to be referred to my second section (B) of the genus. The chelipedes differ, however, from those of *M. banksii* and other species in having the carpus distinctly granulated, and in having no spine, but only a tubercle, at the proximal end of the ridge on the exterior surface of the palm, &c. (see the figure). Length of the specimen from Albany Island about 10 lines (21 millim.), breadth about $9\frac{1}{2}$ (20 millim.). The male above referred to is somewhat smaller. In only a few of the specimens is any trace of coloration to be seen; and in these examples the markings are in the form of largish patches or blotches, sometimes defined by darker marginal lines, and in some of the spirit-specimens there are longitudinal waved lines on the posterior regions.

No reference was made to this species in my "Monograph of the genus *Matuta*,"* because the few specimens then before me were

* Trans. Linn. Soc. ser. 2, Zool. i. p. 243 (1877).

without locality, and being also of very small size, I was uncertain whether to regard them as belonging at all to this genus, and if so, whether they might not represent an immature condition of one of the known species. This, I am inclined to think, cannot be possible, since there are one or two *Matutæ* in the collection no larger than *M. inermis*, in which nevertheless the lateral spines are distinctly developed and the carapace of the normal width. In the obsolescence of the lateral spines *M. inermis* resembles the genus *Cryptosoma*; but in the form of the chelipedes and of the dactyli of the swimming-legs and in the mouth-organs it is altogether a *Matuta*.

113. Calappa hepatica (*Linn.*).

An adult male was obtained near Clairmont on a coral-reef (No. 151).

Specimens are in the British-Museum collection from the following Australian localities:—Trinity Bay, N.E. Australia (*J. Macgillivray*, H.M.S. 'Rattlesnake'), also from Bramble Key and West Hill (*J. B. Jukes*). Hess records it from Sydney.

I have already* referred to the extended geographical range of this common species, which is more generally known by Fabricius's designation *C. tuberculata*.

114. Dorippe dorsipes.

Cancer dorsipes, *Linn. Mus. Lud. Ulricæ*, p. 452 (1764); *Syst. Nat.* ed. xii. p. 1053 (1766), *not of Rumphius, Fabricius, or Herbst.*

Cancer frascone, *Herbst, Naturg. Krabben etc.* i. p. 192, pl. xi. fig. 70 (1790).

? Cancer quadridens, *Fabricius, Ent. Syst.* ii. p. 464 (1793).

Dorippe quadridens, *Fabr. Ent. Syst. Suppl.* p. 361 (1798); *De Haan, Faun. Japon., Crust.* p. 121, pl. xxxi. fig. 3 (1841); *White, List Cr. Brit. Mus.* p. 54 (1847); *Stimpson, Pr. Ac. Nat. Sci. Phil.* p. 163 (1858).

Dorippe atropos *and* D. nodulosa, *Lamarck, Syst. Anim. sans Vert.* v. p. 245 (1818).

Dorippe quadridentata, *M.-Edw. Hist. Nat. Crust.* ii. p. 157 (1837); *Hilgendorf, Monatsb. Akad. Wissensch. Berlin*, p. 812 (1878); *Haswell, Cat. Austr. Crust.* p. 137 (1882).

To this species are referred a male from Port Molle, 14 fms. (No. 93); another from Port Denison, 4 fms.; a female from Flinders, Clairmont, N.E. Australia, 11 fms.; and a small male in very imperfect condition from Thursday Island, 4–6 fms. (No. 130), in which the carapace is narrower than usual. All of the above from the first collection. In the second collection, three small specimens from the Arafura Sea, 32–36 fms. (No. 160), probably belong here. Another very small example from Friday Island, 10 fms. (No. 153), which has the carapace glabrous, but tuberculated nearly as in *D. dorsipes*, I cannot assign with certainty to any species.

* Phil. Trans. clxviii. p. 491 (1879).

I designate this common species (which is usually referred to under the Fabrician name *quadridens* or *quadridentata*) *D. dorsipes*, because Linnæus's somewhat detailed description in the 'Museum Ludovicæ Ulricæ' agrees with it excellently in almost every particular, and more especially as regards the disposition of the spines on the postabdominal segments of the male, where, however, it must be noted that there is usually a tubercle on the first postabdominal segment, which is described by Linnæus as "*inermis*." In the female there are between the larger spines or tubercles of the postabdominal segments several smaller spinules. If this species be not truly *D. dorsipes* of Linnæus, it would appear (as Hilgendorf notes) that Herbst's name of *D. frascone* has still priority over the Fabrician designation.

Of this species there are specimens in the British-Museum collection from several localities on the North-eastern coast of Australia, *e. g.*, Torres Straits (*J. B. Jukes*), Dunk Island (*J. Macgillivray*, H.M.S. 'Rattlesnake'), and near Cumberland Island (*J. Macgillivray*); also a small specimen from Shark Bay, W. Australia (*F. M. Rayner*, H.M.S. 'Herald'), in which the eye-peduncles are relatively much longer, probably belongs here. There are, besides, specimens in the Museum collection from the Indian Ocean (*Hardwicke*); Ceylon (*E. W. H. Holdsworth*); Philippine Islands (*Cuming*); Japan (*Leyden collection*); and China seas (*R. Swinhoe*).

There are in the Museum collection two specimens from Shanghai, which have the carapace and ambulatory legs much more tomentose, the median spines of the front less prominent, and the right-hand chela (in the male) considerably developed, with the palm swollen and vertically very deep; they are probably only old and large specimens of this species.

Three female specimens from China only differ in the remarkable breadth of the carapace at the branchial regions, and the larger size of some of the wart-like tubercles of the dorsal surface, and are probably not distinct. A specimen from Canton Province (*Dr. Cantor*) approaches in the lesser width of the carapace ordinary females of *D. dorsipes*. In all of these the postabdomen is deficient.

Finally, two specimens from Zebu, Philippines (*Cuming*), which White has referred to *D. callida*, Fabr., only differ in the slender legs and in the obsolescence of the tubercles of the carapace, whose surface, however, is uneven and elevated where these tubercles ordinarily exist. They may be distinct or only a variety of *D. dorsipes*.

115. Dorippe australiensis. (Plate XXVI. fig. D.)

I thus designate a small example obtained at Port Denison, 4 fms.; also two specimens from Moreton Bay (*purchased*), and four from the Australian coast (*Dr. Bowerbank*), but without any special indication of locality, in the British-Museum collection.

This form is evidently very nearly allied to *D. granulata*, De

Haan, from the Japanese seas*, but differs from his description and figure, and from a Japanese specimen in the Museum collection, in the following characters:—The carapace is somewhat more depressed, and granulated only toward the sides, the gastric and cardiac regions being smooth; the second and third legs are naked, the merus-joints much slenderer and less compressed than in *D. granulata*, and smooth, not granulated; the following joint is bicarinated as in *D. granulata*, but the carinæ are not granulated. In the single male example of *D. granulata* I have seen, the palm of the larger (right) chelipede is granulated on its outer surface, in *D. australiensis* it is smooth. These observations and the figure (*d*) of the chela are based on adult examples received from Dr. Bowerbank, as the specimen received from Dr. Coppinger is very small and is, moreover, a female. This species is also very nearly allied to *D. astuta*, Fabricius; but in specimens referred to the latter from the Indian Ocean and the Philippines, in the Museum collection, the carapace is smooth and narrower, the legs slender, and the carpus-joint in the second and third pairs not longitudinally bicarinated. In *D. sima*, M.-Edw., on the contrary, the second and third legs are much more robust, and there is a strong spine at the inner suborbital angle, which is wanting in the three species above mentioned.

ANOMURA.

1. Cryptodromia lateralis.

? Dromia lateralis, *Gray, Zool. Miscell.* p. 40 (1831).
Dromia verrucosipes, *White, List Crust. Brit. Mus.* p. 55 (1847).
Cryptodromia lateralis, *Stimpson, Proc. Ac. Nat. Sci. Philad.* p. 239 (1858); *Heller, Reise der Novara, Crust.* p. 71 (1865); *Miers, Cat. New-Zeal. Crust.* p. 57 (1876); *Haswell, Cat. Austr. Crust.* p. 139 (1882).

A male from Port Jackson, 5–7 fms. (No. 104), is referred to this species. Specimens from the same locality are in the British-Museum collection (*Antarctic Expedition* and *J. Brazier*). Other Australian localities indicated by specimens in the British Museum are:—Nicol Bay (*M. du Boulay*); Brisbane (*Cuming*); Tasmania (*Cuming*, *Ronald Gunn*); Bass Straits (*J. Macgillivray*, H.M.S. 'Rattlesnake'); Fremantle (*Dr. Bowerbank*); King George's Sound, West Australia (*F. M. Rayner*, H.M.S. 'Herald'); also from Japan, Madjica-Sima (*H.M.S.* '*Samarang*'), Philippine Islands, Bohol (*Cuming*), and New Zealand.

This species is without doubt the *Cryptodromia lateralis* of Heller; and Dr. Gray's short diagnosis also agrees with our specimens so far as it serves; but he does not mention one of the most salient characteristics of the species—the nodosities of the chelipedes and ambulatory legs. In certain of the specimens, however, these prominences are much less apparent, and the longitudinal carinæ of

* In Siebold, Fauna Japonica, Crust. p. 122, pl. xxxi. fig. 2 (*sima*), 1841.

the penultimate and antepenultimate joints of the ambulatory legs are more distinct.

2. Petalomera pulchra. (Plate XXVII. fig. A.)

Carapace somewhat oblong-oval, and a little longer than broad, moderately convex and granulated; its anterior parts are rather thinly pubescent, the front in its median portion is nearly vertically deflexed (see fig. *a*); the lateral frontal lobes are prominent, in a dorsal view triangulate, and are separated from one another by a deeply concave interspace. The upper orbital margin is thin, prominent, and entire; there is a small notch at the outer angle; the sides of the carapace are armed with three small teeth placed in an oblique series, the anterior of which is situated upon the subhepatic region; the carapace in front of these teeth is somewhat coarsely granulated. Distinct longitudinal ridges exist on the endostome or palate. The sternal *sulci* in the female are remote from one another, and terminate in tubercles which are situated a little behind the bases of the second pair of legs (see fig. *a'*). The eyes are of moderate length, corneæ distinct; the peduncles of the antennæ are rather robust; the second joint somewhat longer than the first or the third. The merus-joint of the outer maxillipedes is about as long as the ischium, truncated at its distal end, and without any notch at its antero-external angle where the next joint articulates with it. The chelipedes are subequal; the merus has its upper margin produced into a high arched crest, its inner surface is smooth and polished, its outer pubescent, the inner and lower margin is sharp-edged and entire; the wrist and palm are also slightly cristated above, and have their outer surfaces granulated and pubescent; the wrist has two larger tubercles or prominences at its distal end; the granules on the palm disposed in six longitudinal series; fingers somewhat shorter than the palm and meeting along their regularly serrated inner edges when closed, excavate and naked at the apices. The ambulatory legs are pubescent and moderately robust; the merus-joint of the first pair has its upper margin produced (as in the chelipedes) into a high arched crest, in the next pair this joint is not specially dilated and its upper margin is straight; the last two legs terminate in a small curved claw, but the penultimate joint has no terminal spiniform process. Colour (in spirit) greyish or cinereous. Length of carapace nearly $\frac{3}{4}$ inch (19 millim.), breadth $8\frac{1}{2}$ lines (18 millim).

The females were obtained in Prince of Wales Channel, 7–9 fms.

This species is distinguished from *P. granulata*, Stimpson, the type of the genus, from Kajosima, Japan, by the absence of a distinct supraocular tooth, and by the non-cristated merus-joint of the third pair of legs, &c. It cannot be confounded with any of the Australian *Dromiæ* described by Mr. Haswell (Catal. pp. 139–141).

PARATYMOLUS, *Miers.*

The affinity of *Paratymolus*, and particularly of the later described species *P. latipes*, Haswell, and *P. sexspinosus*, Miers, with *Telmessus* is pointed out by Mr. Haswell, and is undeniable, notwithstanding the very differently shaped carapace of *Telmessus*, and the fact that in that genus the basal antennal joint has its outer margin produced into a broad triangulate lobe which enters the inner orbital hiatus. The affinities of *Paratymolus* with *Homola* are also very evident, and I have already referred to them. In *P. pubescens* and *P. bituberculatus* the distal margin of the merus-joint of the outer maxillipedes is somewhat rounded as in certain Inachidæ, to which family this genus further approximates in its slender basal antennal joint. Whether the genus *Paratymolus* be associated with *Telmessus* or not, its affinities are, I think, with the Maioid Anomura, to which also *Homola* belongs, rather than with the Corystidæ. I retain this genus therefore for the present near the Dromiidæ, where also Haswell keeps it.

3. Paratymolus bituberculatus, *Haswell*, var. gracilis.

A male is in the collection, from Prince of Wales Channel, 7–9 fms., which is thus designated with some hesitation. The principal character distinguishing *P. bituberculatus* from *P. pubescens* is to be found in the subtriangulate chela, the upper distal end of which is produced into a more or less prominent tooth; the teeth on the posterior margins of the merus and palm, which are very distinctly indicated in Mr. Haswell's figure, exist in Dr. Coppinger's specimen only as small tuberculiform setigerous prominences; and, moreover, the spine in front of the principal hepatic spine, which exists in the type specimens of *P. pubescens* and of *P. bituberculatus*, is wanting in the example from Prince of Wales Channel, which should not improbably be separated as a distinct species.

A mutilated female, in which both chelipedes are deficient, from Thursday Island, 3–4 fms. (No. 177), greatly resembles the type of *P. pubescens*, Miers *, from Matoya, in the form of the carapace and number and disposition of its spines and tubercles, differing only in the somewhat less prominent rostrum, and may perhaps belong to that species.

4. Paratymolus sexspinosus. (Plate XXVII. fig. B.)

This form is a near ally of the *Paratymolus latipes* described by Mr. Haswell, but differs in the following particulars:—The lobes of the rostrum are blunter, and the median notch much smaller; the antero-lateral margins of the carapace are armed with only three spines or teeth, including the præocular spine, the postocular being deficient; the chelipedes and ambulatory legs in the specimens examined (which, however, are females) are slenderer; the merus-

* Proc. Zool. Soc. p. 45, pl. ii. fig. 6 (1879).

joints of the chelipedes have three or four granules or spinules on the posterior, but none on the anterior margin, and the palm is without either granules or spinules; the ambulatory legs are much less dilated and compressed than in Mr. Haswell's figure*.

From *Paratymolus pubescens* and *P. bituberculatus* this form is distinguished not merely by the different shape and tuberculation of the carapace, but also by the shorter eye-peduncles and second antennal joint, and by the more dilated last joint of the peduncle of the antennæ, and the more distinctly operculiform maxillipedes, which are altogether of the Maioid type, with nearly quadrate merus-joints (see fig. *b*). The legs also are more robust. Colour (in spirit) light yellowish brown. Length of carapace of an adult female with ova nearly $3\frac{1}{2}$ lines (7 millim.), greatest breadth nearly 3 lines (6 millim.); length of chelipede about $3\frac{1}{2}$ lines (7 millim.), of second ambulatory leg about 5 lines (11 millim.).

Three specimens (females) are in the collection from Friday Island, 10 fms. (No. 153). The distinctions between the two forms above enumerated are, I think, too marked to be due to sex. The sex of Mr. Haswell's types from Port Denison and Port Jackson is not stated, but the figure of the postabdomen nearly resembles that of our adult female *P. sexspinosus*.

5. Diogenes rectimanus. (Plate XXVII. fig. C.)

The carapace is depressed, with the sides in front of the branchial regions uneven and with a few hairs; the lateral margins armed with three or four spinules; the frontal margin broadly sinuated, with scarcely any trace of a median prominence, but with distinct lateral spinules, situated between the bases of the eye-peduncles and antennæ; the branchial regions are but little dilated; the rostral scale is linear, acute, and reaches nearly to the apices of the ophthalmic scales, which are broadly ovate, with three or four minute denticules at their distal ends. The postabdomen is clothed with longish hairs, and has four filamentous appendages on its left side, its fifth and sixth segments are protected by dorsal calcareous plates; the terminal segment is slightly transverse, divided by a median notch into two rounded lobes, which are ciliated and spinulose on the margins. The eye-peduncles are nearly as long as the transverse width of the frontal margin of the carapace, much shorter than the antennal peduncles, with the corneæ not dilated. The penultimate joint of the peduncle of the slender antennules reaches just beyond the apex of the eye-peduncles; the antepenultimate joint of the peduncle of the antennæ is prolonged into a spine, which reaches nearly to the apex of the following joint; this spine is armed on its inner margin with a series of smaller spinules, and there is a smaller spine on its outer side at base; the terminal peduncular joint reaches beyond the eye-peduncles; the joints of the flagella are fringed below with long flexible hairs. The outer and lower margin of the

* Ann. & Mag. Nat. Hist. ser. 5, v. p. 303, pl. xvi. figs. 3–5 (1880).

trigonous merus-joint of the larger (left) chelipede is armed with three or four spinules at its distal extremity: the carpus is but little shorter than the palm and granulated externally, the granules on the upper margin increasing in size to the distal end, where they are spinuliform: the palm also is externally granulated and pubescent; the lower margin is in a straight line with the lower margin of the immobile finger, and is armed with several much larger acute spinules; a few somewhat large granules exist also at the base of the palm, and others are arranged in a longitudinal series along the outer surface parallel to the upper margin, and also along the upper margin of the palm and of the dactyl, which is about as long as the palm, flattened externally, and fitting closely against the lower finger, having on its inner margin near the base a rounded lobe, which is received into a corresponding cavity in the inner margin of the lower finger. The smaller chelipede has the slender wrist and hand clothed with yellowish hairs; the wrist armed above with small spinules arranged in two longitudinal series. The second and third ambulatory legs are slender and thinly pubescent, with the dactyli arcuated and rather longer than the foregoing joints. The fourth and fifth legs are subchelate, the small dactyl impinging against the broad spongy pad which terminates the penultimate joint. The filamentary appendages of the postabdomen are clothed with long hairs. The left uropod only is perfect; it has the inner ramus larger than the outer. The colour is whitish, with faint indications of pink upon the legs. Length of the carapace about 4 lines (nearly 9 millim.), of the left chelipede about 9 lines (19 millim.), of the third ambulatory leg about 11 lines (23 millim.).

The single example in Dr. Coppinger's collection is from Prince of Wales Channel, 7 fms. (No. 169).

This species scarcely differs from *D. spinulimanus*, Miers, except in the longer slenderer rostrum, denticulated ophthalmic scales, and in having the lower margin of the immobile finger in a straight line with the lower margin of the palm (fig. *c*), whereas in the typical *D. spinulimanus* the lower finger is bent downward and the ophthalmic scales subentire. In *D. penicillatus* the eyes are much shorter, there is a median rostral spine, and the left chela has a double series of spinules above.

It may be distinguished from the species of *Diogenes* included in Mr. Haswell's Australian Catalogue (pp. 156, 157) as follows:—From *D. miles*, Fabr., by the much less spinulose chelipedes and shorter tarsi of the ambulatory legs; from *D. custos*, Fabr., by the narrower, non-denticulated, rostriform appendage; from *D. granulatus*, Miers, by the very different form and armature of the larger (left) chelipede, &c.; and from *D. senex*, Heller, by the shorter rostrum and eye-peduncles, which latter do not reach to the end of the peduncles of the antennæ, the different spinulation of the palms of the chelipedes, &c.

6. Pagurus imbricatus, *M.-Edw.*

A specimen which I believe to be an adult male is referred here from Thursday Island, 3–4 fms. (No. 145), an adult female from the same locality and depth (No. 175), and a smaller male from Prince of Wales Channel, 9 fms. (No. 157).

Specimens also are in the British-Museum collection from Shark Bay, W. Australia (*Rayner*, H.M.S. 'Herald').

The smaller examples agree very well with Milne-Edwards's brief description*. As, however, the animal increases in size, small granules or prominences are developed upon the anterior margins of the flattened tubercles or scales of the outer surface of the left chelipede, which in the male from Thursday Island are large enough to give it a uniformly granulated appearance.

7. Pagurus hessii. (Plate XXVIII. fig. A.)

Carapace depressed, with a few hairs on the sides near the front, the cervical suture distinctly defined; the branchial regions but moderately dilated on the sides; with no median rostral tooth, but with the lateral frontal teeth (situated just outside of the bases of the eye-peduncles) triangulate and subacute; lateral margins without spines. Ophthalmic segment, between the eyes, completely uncovered. Terminal postabdominal segment divided by a median notch into two unequal rounded lobes. Eye-peduncles robust, in the adult shorter than the width of the front, with the corneæ considerably dilated; their basal scales with a rounded lobe on their outer margins, and with their apices subtruncated and armed with two or three spinules. The peduncles of the antennules in the adult scarcely reach to the end of the eye-peduncles; the antepenultimate and penultimate joints of the peduncles of the antennæ each bear a small spinule above, besides the longer *aciculum* which projects from the dorsal surface of the penultimate joint, which has one or two smaller spinules on its inner margin; the joints of the antennal flagella are almost naked. The coxæ of the outer maxillipedes and chelipedes are almost contiguous. The chelipedes are nearly equal and of moderate size; the merus-joints trigonous, the margins (in the adult) armed with a few spinules toward the distal extremity; upper and outer surface of the wrists scantily hairy and spinulose, the spinules arranged in three longitudinal series; palms rather turgid, about as long as the fingers, spinulose and hairy, the spinules smaller and more crowded below, larger and more distinctly longitudinally seriate on the upper and outer margins; fingers spinulose and hairy, with subexcavate dark corneous tips, and opening somewhat obliquely. The last three joints of the first and second ambulatory legs are hairy and spinulose above; the terminal joints slender, longer than the preceding, and externally longitudinally canaliculated on the inner surface, bearing a series of oblique *sulci* which are bordered with hairs. Both the fourth and fifth legs are chelate;

* Ann. Sci. Nat. sér. 3, Zool. x. p. 61 (1848).

the dactyli well developed and impinging against the produced scabrous infero-distal lobe of the preceding joint. The postabdomen (in the female) has on its left side three appendages, articulated with as many membranaceous dorsal plates, and each terminating in four filaments or flagella, which are clothed with long hairs. The uropods on one side are imperfect, their rami are margined with rather long hairs; the segment with which they are articulated has a longitudinal groove on its dorsal surface. The coloration (which is probably faded in both the specimens examined) is yellowish or whitish, with very faint pink reticulations in the larger specimen; the chelæ are pink, the eye-peduncles bordered on the sides with broad longitudinal bands of brownish pink; the under and inner surfaces of the last two joints of the second and third legs are of the same colour. The length of the carapace (in the larger specimen) is about 1 inch 5 lines (37 millim.), the length of the third (right) leg exceeds $3\frac{1}{2}$ inches (90 millim.); but the specimen being dried, its exact dimensions cannot be given.

Of this species a rather small adult female was taken in the Arafura Sea, 32–36 fms. (No. 160). A much larger female, in mutilated condition, wanting the postabdomen, is among the Banksian specimens in the British-Museum collection, from which the description is mainly taken.

This species resembles *Clibanarius*, and differs from most species of *Pagurus* in the subequal spinulose chelipedes; in the structure of the ophthalmic segment of the eyes, the absence of a rostrum, and in other points it is a true *Pagurus*. In *P. platythorax*, Stm., a species with equal chelipedes, the chelæ and legs are not spinulose.

The *Pagurus minutus*, Hess (*vide* Haswell, Cat. p. 156), from Sydney, is too briefly described for certain identification, but seems to be distinguished from *P. rubrovittatus* by the shorter antennal appendages and tuberculated non-spinuliferous chelipedes.

8. Clibanarius tæniatus.

Pagurus clibanarius, *Quoy & Gaimard in Voy. de l'Uranie, Zoologie, Crust.* p. 529, pl. lxxviii. fig. 1 (1824).

Pagurus tæniatus, *M.-Edwards, Ann. Sci. Nat.* sér. 3, *Zool.* x. p. 62 (1848).

Clibanarius tæniatus, *Stimpson, Proc. Acad. Nat. Sci. Philad.* p. 235 (1858).

A single male was obtained at Port Molle, inhabiting a shell of a species of *Purpura*. Another specimen, presenting a precisely similar system of coloration, is in the British-Museum collection from Shark Bay (*F. M. Rayner*, H.M.S. 'Herald').

These specimens agree with the figure of Quoy and Gaimard, and differ from the specimens referred to *C. vulgaris* in the collection of the British Museum, in having the carapace (as well as the ambulatory legs) marked with longitudinal pale lines bordered with red: in the specimens referred to *P. vulgaris* this coloration does not exist upon the carapace; the eye-peduncles are somewhat longer and

slenderer, the chelæ less swollen toward the base, and armed above with stronger spinules, which are white, and contrast strongly with the red ground-colour of the palms. It is possible, but I do not think it probable, that this species is a variety of *C. vulgaris*; the figure of Quoy and Gaimard was originally cited by M.-Edwards as synonymous with that species; nor can I be certain that the distinctions mentioned exist in M.-Edwards's *C. vulgaris*, not having seen the types.

Another very small specimen of this genus is in the collection from Port Molle (No. 118), which can scarcely be referred with certainty to any species.

9. **Eupagurus compressipes.** (Plate XXVIII. fig. B.)

The carapace is nearly smooth, moderately dilated at the branchial regions, with the cervical suture very distinctly defined; the frontal margin between the eyes is very little prominent, and there is no median rostriform projection, and but two small triangular teeth on the frontal margin, situate one on the outer side of each eye-peduncle. The eye-peduncles are shorter than the carapace is wide in front, robust, and have the corneæ somewhat dilated; their basal scales are dilated at base, narrow, subacute, and entire at apex, with the margins ciliated but not denticulated. Antennulary flagella very short. The bases of the antennæ bear a short spine on their outer margins, which does not reach halfway to the apex of the eye-peduncles; articulated with the dilated base of this is a longer spine, which is serrated on its inner margin, and prolonged above the bases of the antennæ nearly to the end of the eye-peduncles, on the inner side and at the base of which is a small spinule. The joints of the flagella of the antennæ are setose. The outer maxillipedes are remote from one another at their bases, and the inner margins of the ischium-joints are denticulated. The legs are pubescent; the right chelipede is more robust, but little longer than the left; the outer margins of the merus-joints in both chelipedes are spinulose toward the distal extremities, the carpus spinulose on its inner margin and on its upper surface; the hand in the larger chelipede is narrow-ovate, and very obscurely spinulose on the margins and in the middle of its outer surface, the spinules or granules nearly concealed by the pubescence; the fingers are rather shorter than the palm, denticulated on their inner margins, acute at their apices, and have between them no hiatus when closed; the smaller (left) hand is similar, but slenderer. The first and second ambulatory legs have the joints, except the dactyli, somewhat dilated and compressed, the merus-joints with a series of spinules on their anterior margins; the dactyli longer than the preceding joints, slender, somewhat compressed and curved, but not contorted. The acute infero-distal angle of the penultimate joint of the fourth legs is produced halfway along the inferior margin of the dactylus. The fifth legs are subchelate, and the chelæ densely hairy. The male postabdomen (as well as the female) bears several pairs of filiform

appendages; the uropoda are asymmetrical; the terminal segment is rather deeply notched at its distal end, the lobes denticulated. Colour (in spirit) a very light orange-pink. Length of carapace of male about $3\frac{1}{2}$ lines (nearly 8 millim.), of right chelipede about $6\frac{1}{2}$ lines (14 millim.), of second ambulatory leg about 10 lines (21 millim.).

Two specimens were collected at Port Denison, 4 fms. (No. 111). The larger is a male, the smaller a female with ova.

E. compressipes resembles *E. tricarinatus*, Stimpson, from Japan, and *E. acantholepis*, Stm., from Port Jackson*, in the absence of a rostrum, but is distinguished from both by the nearly smooth chelæ and the more dilated joints of the first and second ambulatory legs, and from the latter also by the somewhat dilated corneæ of the eyes, the non-canaliculate carpi of the chelipedes, &c.

10. **Eupagurus kirkii.** (Plate XXVIII. fig. C.)

In this little species the carapace is scantily hairy, with the branchial regions moderately dilated, without any indication of a rostrum, and without lateral teeth, and rounded off at the antero-lateral angles. The terminal postabdominal segment has its margins minutely spinulose, is rounded on the sides, and without a median notch. The eye-peduncles are slender, and about as long as the width of the frontal margin; corneæ small and not dilated; ophthalmic scales small, entire, with subacute apices. The basal antennal joint is very short, and has a very small spinule on its outer margin; the dorsal aciculum of the following joint is very slender, and reaches very nearly to the apex of the eye-peduncles; the flagella nearly naked. The merus-joints of the chelipedes have a small spinule at the distal ends of their upper margins; the wrists are hairy, and spinulose above, with a series of more prominent spinules along the inner and upper margins; the larger (right) chela is ovate, scantily hairy, rather swollen within, externally nearly flat, with a series of small spinules along its upper and lower margins, and with some obscurely indicated granules on its outer surface: the fingers are shorter than the palm, and have between them a small hiatus at base when closed; the lower is granulated externally; both are spinulose on their outer, and toothed on their inner margins. The second and third legs are of moderate length, hairy and smooth, without spines or tubercles; the dactyli a trifle shorter than the preceding joints; the fourth legs are short and imperfectly subchelate (the infero-distal lobe of the penultimate joint being but little developed); the fifth legs apparently not subchelate, the dactyli clothed with long hairs. The uropoda are, as usual, asymmetrical; the rami with a scabrous pad on their outer surfaces. Colour (in spirit) pinkish white. Length of carapace about $3\frac{1}{2}$ lines (about 7·5 millim.), of larger chelipede about $6\frac{1}{2}$ lines ($13\frac{1}{2}$ millim.), of left ambulatory leg of first pair about 7 lines (15 millim.).

A single male was obtained in the Arafura Sea (32–36 fms.).

* Proc. Acad. Nat. Sci. Philad. p. 251 (1858).

From most of its congeners this species is distinguished by the absence of a distinct rostrum, and the form and armature of the larger chelipede; the latter character will distinguish it from *E. tricarinatus* and *E. acantholepis*, Stimpson, from Japan and Port Jackson, species in which the rostrum is absent. From the foregoing species it is at once distinguished by the longer, slenderer eye-peduncles with shorter basal scales, the form of the chelæ, slenderer ambulatory legs, &c.

11. **Petrolisthes japonicus** (*De Haan*), var. **inermis**, *Haswell.*

Port Molle (No. 103), several specimens obtained on the beach between tide-marks; Port Curtis, 7–11 fms. (No. 85), several specimens.

Other specimens are in the collection of the British Museum from Facing Island, Port Curtis (*J. Macgillivray*, H.M.S. 'Rattlesnake'); and a small example from Shark Bay, W. Australia (*F. M. Rayner*, H.M.S. 'Herald'), probably belongs here.

This species is closely allied to the well-known New-Zealand *P. elongatus*, M.-Edwards, but the chelipedes have a longer, slenderer wrist, and the palm is slenderer and its outer margin is straight, not arcuated. The variety *inermis* is distinguished by Mr. Haswell by having two spines near the distal end of the posterior margin of the wrist, not three as in *P. elongatus*. De Haan in his description of *P. japonicus* mentions three, but figures two only. The wrist is even longer and the palm more roughened above than in the Australian specimens; and the second pair of legs only has the merus-joint bispinulose at apex.

The Japanese species *Petrolisthes pulchripes*, designated by White *Porcellana pulchripes* (List Cr. Brit. Mus. p. 129, 1847), of which the type, from the Madjica-Sima group, is in the collection of the British Museum, is closely allied to the foregoing; but the chelipedes have a short thick carpus, which is much shorter than the cephalothorax, and has three teeth on its posterior margin; the distal end of the merus-joints of both second and third ambulatory legs is unarmed.

12. **Petrolisthes lamarckii** (*Leach*).

Here are referred several specimens found on the beach at Flinders Island, and one obtained between tide-marks at Port Molle (No. 103). These examples are of small size; the front is triangulate, somewhat deflexed, sinuated on the margins, concave in the middle line above, narrowed to the apex, which is rounded; there is a very distinct postocular spine on the lateral margins of the carapace; the chelipedes are closely granulated above; the arm has a blunt tooth at the distal end of its inner margin; the inner margin of the wrist has three triangular, not very distant teeth, which decrease in size from the first to the last; at the distal end of the posterior margin are three small spines. Colour reddish or yellowish; the first and second ambulatory legs (where the coloration is best preserved) have the

carpus and penultimate joints alternately banded with yellow and red.

The type of Leach's *P. lamarckii* (from Australia) in the Museum collection has lost its chelipedes; hence the identification is not certain; but the carapace in all respects agrees with the specimens described above, and there exists a distinct postocular spine on the lateral margins.

The type specimens of *P. asiaticus*, from the Mauritius, are of larger size, but scarcely differ except in having the anterior margins of the wrists armed with more distant, but relatively smaller teeth, and in having the distal ends of the merus-joints of the first and second ambulatory legs more distinctly denticulated. Specimens apparently belonging to this form are in the Museum collection from various islands of the Pacific and Malaysian seas; and I think it very probable that it should be united with *P. lamarckii*. I may note here that the specimen recently figured by Richters* as *P. asiaticus*, Leach (and by him retained in the genus *Porcellana*), has a more distinctly truncated median frontal lobe, and only two teeth on the posterior margin of the arm of the chelipede, and may perhaps belong to a distinct species.

13. **Petrolisthes haswelli.** (Plate XXIX. fig. A.)

Carapace flattened, longer than broad, and marked with faint transverse striæ, which are bordered with short hairs; the lateral margins are cristated, the carinæ extending from the outer orbital angles to about the middle of the branchial regions; the front is subtriangulate, with the apex rounded and concave above, the margins somewhat sinuated; the outer orbital angle is not very prominent, behind it there is a spine on the hepatic region; the upper orbital margins are entire. The eyes are short and thick. There is a prominent tooth or lobe upon the antepenultimate joint of the peduncle of the antennæ, whose flagella are very long and naked. The chelipedes are moderately robust, the merus or arm very short, with a prominent lobe at the distal end of its inner margin: the carpus is flattened above, its upper surface tuberculated, the tubercles, which in the middle line are generally larger, are flattened and bordered with short hairs; its anterior margin armed with four or five unequal teeth, whose margins are themselves generally denticulated; the posterior margin armed with three spines at its distal end; palm and fingers closely tuberculated on their outer surface, the tubercles bordered with short hairs, and merging toward the upper margin into longitudinal striæ; the lower margin of the palm is straight and subcristated; fingers shorter than the palm, meeting along their inner edges, and incurved at the tips. Ambulatory legs slightly hairy, with the merus-joint moderately dilated and compressed, without spinules or teeth, except one or two small denticles at the distal end of the lower margin; the following joints

* In Möbius, Beitr. zur Meeresfauna der Insel Mauritius &c., Decapoda, p. 159, pl. xvii. fig. 13 (1880).

are slender; dactyli short, terminating in a small claw. Colour (in the spirit-specimen) pale reddish yellow, punctulated with darker red. Length nearly 7 lines (14 millim.), breadth a little over 6 lines (13 millim.); length of chelipede about $1\frac{1}{3}$ inch (34 millim.).

An adult female is in the collection from Thursday Island, obtained on the beach (No. 167).

There is also in the Museum collection a female from Port Curtis, Facing Island, two examples from Torres Straits (*J. B. Jukes*), and two from the 'Samarang' collection, of which one is from Koo-Keang-San.

The three distinct spines on the posterior margin of the arm seem to distinguish this form from the *P. bellis* of Heller, from the Nicobars—a species, however, which is only briefly characterized.

It is evidently very nearly allied to *Petrolisthes rugosus* (M.-Edwards), to which are referred specimens in the British-Museum collection from Karachi (*Karachi Museum*) and North Australia (*Dr. J. R. Elsey*), which species, however, has the carapace and chelipedes covered with well-defined piliferous crests, and the teeth of the anterior margins of the wrists much more regular in form and disposition.

14. **Petrolisthes annulipes.** (Plate XXIX. fig. B.)

Petrolisthes annulipes, *White, List Crust. Brit. Mus.* p. 63 (1847), *descript. nullâ.*

Carapace moderately convex, scarcely longer than broad, its upper surface and also that of the chelipedes transversely striated; the striæ imbricated and fringed on the anterior margins with close-set short setæ; the front is subtriangulate, moderately prominent, slightly concave above, with the apex rounded or subtruncated, and the margins usually minutely spinulose; there is a spine on the upper margin of the orbit just in front of the eye-peduncles; the sides of the carapace are armed with about six spines, the first of which (when present) is situated just posterior to the outer orbital angle, the second a little behind it, the third a little within the margin on the front of the branchial region, and the other three on the sides of the branchial region and close to one another. The first exposed joint of the antennæ is armed with a spine (see fig. *b*). The ischium- and merus-joints of the outer maxillipedes are transversely striated and setose, like the carapace; the last three joints fringed on their inner margins with very long hairs. The merus-joint of the chelipedes is armed with a denticulated lobe at the distal end of its inner margin; the carpus or wrist has five denticulated teeth on its anterior margin, and three or four spines on its posterior margin; the palm is armed with a series of minute spinules on its outer or posterior margin; the fingers meet along their inner edges, and have their tips incurved and acute. The ambulatory legs are somewhat hairy, the merus-joints in the first three pairs transversely striated and setose, and armed with spinules on their

anterior margins; in the first two pairs there is also a small spinule at the distal end of the posterior margin. Ground-colour yellowish; the transverse imbrications of the carapace and legs are red; the carpus- and merus-joints of the ambulatory legs are also banded with red. Length and breadth of the carapace of the largest specimen (a female with ova) a little over 4 lines (9 millim.), of chelipede, when extended, $9\frac{1}{2}$ lines (20 millim.).

Two adult females and three males (one very small) are in the first collection from Port Denison, 4 fms. (Nos. 111, 122), and a small male from Port Molle, 5–12 fms. (No. 118); in the second collection is an adult female from Prince of Wales Channel, 7 fms. (No. 169), and two small specimens from Thursday Island, 4–5 fms. (No. 165).

The description is taken from the largest female; in the smallest specimen the anterior margin of the front is minutely denticulated.

There are in the British-Museum collection three specimens obtained off Cape Capricorn (15 fms.). White's typical specimen is from the Philippine Islands, Corregidor (*Cuming*).

In the last consignment received from H.M.S. 'Alert' are specimens from the Seychelles.

This species cannot, I think, be confounded with any of the numerous Oriental forms described by Milne-Edwards, Dana, Stimpson, and Heller.

It is evidently nearly allied to *P. scabricula*, Dana *, from the Sooloo Sea, and to *P. militaris*, Heller †, from the Nicobars, in both of which the spinulation of the carapace is different and the palms of the chelipedes externally pubescent. In *P. scabricula* the series of spines along the posterior margin of the wrist seem to extend along its whole length; and Heller makes no mention of the prominent spine on the upper margin of the orbit in his description of *P. militaris*, which in *P. annulipes* seems to occupy the position of the obtuse-lateral frontal lobes mentioned in his description.

Mr. Haswell (Catalogue, p. 146) refers certain specimens collected at Port Denison to the *Petrolisthes dentatus* of M.-Edwards ‡; but as he only cites M.-Edwards's very short diagnosis and adds nothing respecting the Australian specimens, I am unable to say whether they are distinguishable from the species I have designated *P. haswelli* or from *P. annulipes*. M.-Edwards's types were from Java, and seem to be distinguished from the Australian species by having the posterior margin of the carpus of the chelipedes "dentelé en scie."

15. **Petrolisthes? corallicola** (*Haswell*)? (Plate XXIX. fig. C.)

? Porcellana corallicola, *Haswell, Proc. Linn. Soc. N. S. Wales*, vi. p. 759 (1881); *Cat. Austr. Crust.* p. 150 (1882).

Carapace much longer than broad, the gastric and hepatic regions

* U.S. Expl. Exp. xiii. Crust. i. p. 424, pl. xxvi. fig. 13 (1852).
† Crust. in Reise der Novara, p. 75 (1865).
‡ Hist. Nat. Crust. ii. p. 251 (1837).

defined by very distinct *sulci*, and the whole of its upper surface, except near the posterior margin, very uneven; the front is deeply concave in the middle line, and its median interantennulary portion much deflexed, spinulose, the spinules of unequal length; its lateral margin armed with about seven spinules, and the protogastric lobes also spinulose; the peduncles of the antennæ are without spinules. The merus-joint of the outer maxillipedes fits into a deep notch in the anterior margin of the preceding joint, and is itself excavated at its distal end. The single chelipede present in the unique example before me has a spinulose lobe or tooth at the distal end of the inner margin of the arm; the wrist and palm are flattened on the upper surfece, which is armed with tubercles arranged in longitudinal series, the tubercles themselves for the most part minutely spinulose; the inner margin of the wrist is armed with three or four spines at its base, and beyond with smaller spinules; the posterior margin is armed with about seven spines; there are two spines at the distal end of the inner margin of the palm, and its outer margin is spinulose and pubescent; the fingers meet closely along their inner margins, which are entire, and their outer margins are spinulose. The first pair of ambulatory legs have the anterior margins of the merus, carpus, and propus armed with a few distant spinules, which are almost wholly absent from the same joints in the following legs. Colour whitish. The single specimen examined is a female: the carapace measures nearly 3 lines (6 millim.) in length and $2\frac{1}{2}$ (5 millim.) in breadth; the chelipede, when extended as far as its conformation will allow, about 5 lines (11 millim.).

The single specimen was obtained at Port Molle, between tidemarks (No. 103), with *Petrolisthes japonicus*. The description given above will show that our specimen differs from Mr. Haswell's type in the more uneven carapace with more numerous lateral marginal spinules, non-pubescent posterior margin of the wrist of the chelipede, and in having two spines (not mentioned by Mr. Haswell) at the distal end of the anterior margin of the palm (see fig. *c*). If distinct, I would propose to designate this species *P. dorsalis*. It seems, upon the whole, to have more affinity with the genus *Petrolisthes* than with *Porcellana*, on which account I refer it, although with some hesitation, to that genus.

16. **Polyonyx obesulus.** (Plate XXIX. fig. D.)

Porcellana obesula, *White*, *List Crust. Brit. Mus.* p. 130 (1847), *descript. nullâ.*

I refer to this species, though somewhat doubtfully, a female obtained from Port Denison, 4 fms. (No. 122), also one from Prince of Wales Channel, 7 fms. (No. 169), one from West Island, 7 fms., and one from Port Darwin, 12 fms. These examples resemble the three specimens in the British-Museum collection, and differ from

Dana's description of his *P. biunguiculatus* *, in having a distinctly trilobate front, the middle lobe of which is broad, subacute, or rounded, and not much more prominent than the lateral lobes; whereas in *P. biunguiculatus*, to which species specimens from the Gulf of Suez (*R. MacAndrew*) appear to belong, the median lobe is very prominent and acute and the lateral lobes obsolete. The specimens referred to *P. biunguiculatus* also differ from *P. obesulus* in having the outer surface of the palms of the chelipedes much more closely punctulated. The cephalothorax is narrowest in the smallest-sized specimens; and in the female from Port Denison (which is one of the largest examples I have seen) is much broader than in the others; but I cannot regard this character by itself as of specific importance.

I am inclined to doubt whether the genus *Polyonyx* is distinct from *Megalobrachium*. Stimpson merely distinguishes the latter on account of the absence of the prominent accessory claw, which gives to the dactyli of the species of *Polyonyx* a biunguiculate appearance. The type of *Megalobrachium* (*M. granuliferum*, Stm.) is from the West Indies; but Stimpson refers the *P. macrochelis*, Gibbes, from Carolina, to the genus *Polyonyx*. The other species of the latter genus are Oriental in habitat.

Specimens are referred to *P. biunguiculatus* by Mr. Haswell from Holborn Island, Port Denison, by whom also this species is retained in the genus *Porcellana* (*vide* Cat. p. 147).

17. **Pachycheles pulchellus** (*Haswell*). (PLATE XXX. fig. A.)

Porcellana pulchella, *Haswell. Proc. Linn. Soc. N. S. Wales*, vi. p. 758 (1881); *Cat. Austr. Crust.* p. 148 (1882).

As Mr. Haswell's description is very brief, I append the following from specimens received from Dr. Coppinger:—

The carapace is smooth, rather convex, rounded on the sides, and hence somewhat orbiculate in outline, faintly striated on the sides at the back of the branchial regions. The front is rather broad, and in a dorsal view its margin appears straight; in an anterior view it is seen to be bisinuated, with a broadly rounded but very slightly prominent median lobe. The orbital and lateral margins of the carapace are entire. The first exposed joint of the peduncle of the antennæ is shorter than the following joint, and has sometimes a small blunt prominence on its inner margin; the third joint is short; the flagellum somewhat elongated, with the joints almost naked. The ischium of the outer maxillipedes has a spine at its outer distal angle; the next joint has a prominent lobe on its inner margin; the three following joints are robust. The chelipedes are robust, but not so broadly dilated as in most species of this genus; the merus or arm is very short; wrist with broad low prominences disposed in longitudinal series on its upper surface, and

* *Vide* U.S. Explor. Exped. xiii., Crust. i. p. 411, pl. xxvi. fig. 1 (1852).

with two or three strong triangular teeth on its inner margin; palm about as long as the wrist, and with the lower finger almost triangulate in shape; the outer surface of the palm is divided by four sulci into five longitudinal, smooth, rounded ridges, including the rather less prominent line or ridge along the lower margin of the palm; the fingers are smooth, scarcely denticulated on their inner margins, incurved at the tips, and have between them (when closed) a more or less distinct hiatus; the first to third ambulatory legs have the joints (except the last) armed with small tubercles or prominences on their upper margins; the dactyli have several spinules on their lower margins. The colour (of spirit-specimens) is white, faintly tinged or spotted with pink. Length $2\frac{1}{2}$ lines (5 millim.); breadth a little over $2\frac{1}{2}$ lines (nearly 6 millim.).

Two specimens (male and female) are in the first collection—one obtained at Port Molle, 5–12 fms. (No. 118), and the other at Albany Island, 3–4 fms. In the second collection are eight specimens (male and female) obtained at Thursday Island in 3–4 fms. (No. 177), 4–5 fms. (No. 165). Mr. Haswell records it also from Holborn Island.

This species cannot be confounded with any of the species of *Pachycheles* mentioned by Dr. Stimpson in his very useful Synopsis of the Anomura *; and in its slenderer chelipedes approaches *Porcellana*, to which genus Mr. Haswell refers it.

In two specimens from Prince of Wales Channel, 7 fms. (Nos. 142, 169), which are probably not distinct, the chelipedes are more unequal and smoother. One example has the left chelipede much enlarged, the ridges on the palm separated by wide interspaces, and the fingers strongly arcuated.

18. **Porcellana nitida**, *Haswell*, var. **rotundifrons**.
(Plate XXX. fig. B.)

Carapace smooth, shining, everywhere striated; the striæ short and interrupted. The front is rather prominent, transverse, and very obscurely 3-lobed; the median lobe very broad and rounded; the lateral lobes (or inner orbital angles) also rounded and small. Behind the outer orbital angle, which is dentiform, is a second acute tooth, and behind this a rounded prominence; there is a small tooth on the subhepatic region. The basal joint of the antennæ is very short, the second and third longer, and the fourth very short; the flagellum naked; the ischium-joint of the outer maxillipedes has a spine on its outer margin; the inner margin of the merus is produced into a thin lobe at base, the following joint is robust. The chelipedes are robust and elongated, the joints are smooth; the arm and wrist have their inner margins cristiform and acute and entire; the arm is very short, the wrist somewhat longer; the larger palm (in an adult male) is robust and considerably elongated, its upper margin rounded; the fingers are shorter than the palm,

* Proc. Acad. Nat. Sci. Philad. p. 225 (1858).

curved at tips, and having between them a small hiatus when closed; the upper or mobile finger is strongly arcuated, sometimes with a strong blunt tooth at base; the lower has its inner margin obscurely crenulated and sometimes toothed. The first three pairs of ambulatory legs are robust, the joints nearly naked and without denticles or spinules, except on the inferior margins of the penultimate joints, which have two or three spinules at or near the distal extremity; the dactyli are short, robust, and appear biunguiculate on account of the considerable development of the accessory spine on the inferior margin, behind which is another small denticle. The ground-colour (in spirit) is yellowish; the carapace and chelipedes are blotched with pink or marked with irregular lines of the same colour. Length of carapace of an adult male about 4 lines ($8\frac{1}{2}$ millim.), breadth about $3\frac{1}{2}$ lines (8 millim.); length of chelipede, when fully extended, about $8\frac{1}{2}$ lines (20 millim.).

Port Denison, 4 fms. (No. 122): a considerable number of specimens were obtained. Specimens were also received with the second collection from Friday Island, 10 fms. (No. 153), Dundas Straits, 17 fms. (No. 161), Port Darwin, 12 fms., and others dredged in the Arafura Sea at 32–36 fms. (No. 160).

The description, except as regards coloration, is taken from an adult male; the coloration is perfectly preserved in one specimen only, a female with ova. The larger specimens possessing both chelipedes are mostly of the female sex. In the females and smaller-sized specimens the lateral lobes of the front are often more acute, the palms of the chelipedes relatively shorter, the fingers meet along their inner edges when closed, and the upper finger has not the strong tooth at base, &c.

In the robust and biunguiculate dactyli of the ambulatory legs this form resembles the species of *Polyonyx*, but differs in the relatively longer carapace, which resembles that of other species of *Porcellana*.

I refer it doubtfully to *P. nitida* *, which is very briefly described, and differs apparently in the triangulate form of the median frontal lobe, and in having an additional lateral marginal spine behind the outer angle of the orbit; but as Haswell's types were from Port Denison, at which locality specimens of the form now described were taken by Dr. Coppinger, I distinguish it merely as a variety.

19. **Porcellana dispar**, *Stimpson*. (Plate XXX. fig. C.)

Four males and two females from Port Jackson, 5–7 fms. (No. 104), are referred to this species, which Mr. Haswell (Cat. p. 149) observes is very common at this locality. He also records it from Port Stephens.

Stimpson's description agrees very well with the adult males, but

* *Vide* Haswell, Catalogue, p. 148 (1882).

he does not notice that the outer margin of the smaller chelipede is armed with a series of minute spinules, which are often concealed by the pubescence. The smaller chelipede in the adult male and both chelipedes in the smaller specimens have the anterior margin of the wrist armed with two teeth, and in the smaller specimens (which yet I cannot think belong to a distinct species) the frontal and upper orbital margins are very minutely spinulose. There is developed in both chelipedes a more or less distinct longitudinal median ridge on the upper surface of the wrist and palm, and the outer margin of the hand in both is armed with a series of small spinules, so that these specimens in many points resemble *Porcellana ornata*, Stimpson, from Hong Kong.

20. Porcellana quadrilobata. (Plate XXX. fig. D.)

In the single male from Port Denison, 4 fms., thus designated, the carapace is shaped nearly as in *Porcellanella triloba*, that is, it is much longer than broad, with the sides very slightly arcuated. The upper surface, when viewed under a lens of sufficient power, is seen to be marked with numerous rather closely-set transverse striæ. The inter-antennulary portion of the front, which in *P. triloba* is entire, is in *P. quadrilobata* divided by a median triangular notch (which, however, is not so deep as the lateral notches), hence the front appears 4-lobed. The lobes are triangular and acute; on the inner margin of each of the outer lobes is a small spinule, and the inner margins of each of the inner lobes is minutely serrated. There is a very small tooth or spine at the outer orbital angle, and posterior to this the sides of the carapace are armed with five spines, the three posterior of which are placed near to one another and separated by a somewhat wider interval from the preceding tooth. On the inferior surface of the carapace, below the inferior orbital margin, there is a strong spine. The eyes are set on very short pedicels, and are nearly concealed within the orbits. The joints of the peduncles of the antennæ are short (the flagella wanting in the single specimen examined). There is a spine at the distal end of the basus-joint of the outer maxillipedes; the ischium-joint is somewhat dilated, scarcely at all emarginate at its distal end, where it is articulated with the merus, which is excavated at its distal extremity; the three following joints are moderately robust. The chelipedes are proportionately rather slender and elongated; the merus or arm is short, its inner margin somewhat cristiform, and terminating in a thin subacute lobe; there is a spine also on the under surface of the merus; the wrist is about as long as the palm, and is armed with three spines or teeth on its inner margin; the hand is slightly contorted; the surface both of hand and wrist finely striated; the fingers are rather shorter than the palm, meet along their inner edges when closed and cross at the tips, which are incurved; at the bases of the inner margins of the fingers is a patch of hair; the lower margin of the lower finger is armed with a series of small spinules. The ambulatory legs are rather slender; there are a few short stiff *setæ*, or mobile spines, at the distal end of the

slender penultimate joint of the first to third ambulatory legs; the short, curved dactyli are armed on their lower margins with a strong accessory claw, posterior to which are one or two more small teeth. Colour (in spirit) yellowish. Length of carapace about $2\frac{1}{2}$ lines ($5\frac{1}{2}$ millim.), breadth nearly 2 lines (4 millim.).

This species is scarcely distinguished from the typical *Porcellana latifrons*, Stimpson, except by the somewhat different denticulation of the lobes of the front, and in the latter having, as it would seem, the posterior margin of the wrist armed, as well as the anterior, with three spines. The specimens described by Stimpson were from Hong Kong. *Porcellana armata*, Dana, has a much less prominent front.

Porcellana streptochirus of White*, from the Philippines, is, I think, a mere variety of this species. It differs only in the somewhat broader carapace, in having the frontal lobes armed with more numerous spinules, and in having the under surface of the merus of the chelipedes armed with three or four spines in place of the single spine in *P. quadrilobata*; and these characters are possibly due to the greater age of the specimens.

In one of White's specimens the wrist is tridentate, in the other it is subentire.

This species, in its elongated carapace and slender chelipedes, establishes a transition to the genus (or subgenus) *Porcellanella*, the species of which have a prominent and tridentate front. The genera of the Porcellanidea stand much in need of revision; and I may add that I doubt the constancy of the characters derived by Stimpson from the size and number of the denticulations of the dactyli of the ambulatory legs as generic distinctions.

There are in the collection three small specimens from Thursday Island, 4–5 fms. (No. 165), which in many of their characters are closely allied to *P. serratifrons*, Stimpson, yet are probably distinct, but to which, on account of their very imperfect condition, I will not apply a specific designation. In one specimen the chelipede is probably aborted, having the palm narrow and twisted and the fingers abnormally developed. These specimens are further distinguished from *P. serratifrons* by having three (not 1 or 2) spinules on the sides of the branchial regions, six to eight spines on the anterior, and two on the posterior margin of the carpus of the chelipede, &c. In the single specimen (a young one) possessing both chelipedes the lower margins of both right and left palms are spinulose.

21. **Galathea australiensis**, *Stimpson*. (PLATE XXXI. fig. A.)

Here are referred a male from Port Denison, 4 fms. (No. 111), and another from Port Molle, 14 fms. (No. 93), in the first collection; also a series of seven specimens from the Arafura Sea, 32–36 fms. (No. 160), in the second collection, among which are both males and females. Stimpson's description was from a female. In the adult males I have examined the palms are broader and the fingers have between them a hiatus when closed, and are strongly toothed on their

* List Crust. Brit. Mus. p. 64 (1847), *descript. nullâ*.

inner margins near the base (the teeth themselves generally appearing crenulated when viewed with a lens of sufficient power), and there are usually one or two spinules discernible on the hepatic region.

There are specimens in the British-Museum collection obtained between Cumberland Island and Slade Point, and from Port Jackson (*J. Macgillivray*, H.M.S. 'Rattlesnake'), and others from Flinders Island and Shark Bay, W. Australia (*F. M. Rayner*, H.M.S. 'Herald'). The specimens from Flinders Island and Shark Bay have, however, the upper surface of the wrist and palm of the chelipedes much more strongly and distinctly spinulose, and may possibly prove to be distinct.

Mr. Haswell (Cat. p. 162) notes the possible identity of *G. australiensis* with *G. spinosorostris*, Dana, from the Sandwich Islands, a species somewhat insufficiently described. He has himself briefly characterized a form, the distinctive characters of which may perhaps not be sufficient to separate it from *G. australiensis*. *G. corallicola*, from Port Molle, scarcely differs from *G. australiensis*, except in the absence of the gastric spinules, for the form of the chelæ and fingers is evidently a character liable to variation, according to the sex and age of the individual.

I may note here that there is in the Museum collection a specimen from the Philippines perhaps belonging to the species briefly characterized by Haswell under the designation *G. aculeata*.

22. Galathea elegans.

Galathea elegans, *White, List Crust. Brit. Mus.* p. 66 (1847), *descript. nullâ*; *Crust. in Voy. H.M.S. 'Samarang,'* pl. xii. fig. 7 (1848); *Haswell, Cat. Austr. Crust.* p. 163 (1882).

Here is referred, although with some hesitation, a specimen from Albany Island, 3–4 fms., first collection, and one from Port Molle, 14 fms., second collection. They differ from White's types of this species in the British-Museum collection, from the Philippines, Corregidor (*Cuming*), and Borneo, Unsang (*H.M.S. 'Samarang'*), in the smaller, more inconspicuous spinules of the lateral margins of the rostrum. The chelipedes are somewhat more elongated and slender than in a dried specimen which I take to be a female of White's species, the fingers relatively shorter, and the spinules of the carpus and penultimate joint smaller and well nigh concealed by the pubescence. The coloration, as depicted in the figure cited, is of no value as a specific distinction, since not any two specimens agree exactly in their markings. In the Bornean examples they are much broader than in the Philippine specimens, from one of which they are wholly absent. In the specimen from Albany Island they are distinguishable only on the anterior part of the post-abdomen. The ground-colour in nearly all is dull red.

In the adult males of *G. elegans* (the type specimens of which have never been described) the carapace is strigose, the strigæ ciliated, its lateral margins armed with 8 or 9 prominent spinules; the rostrum is elongated, narrow-triangular, as long, or nearly as long, as the cara-

pace; its lateral margin armed with about 8 spinules; the joints of the chelipedes also spinulose and hairy; fingers rather shorter than the palm, minutely denticulated on their inner margins, not gaping when closed, with the tips incurved; the merus- and carpus-joints of the first and second ambulatory legs are spinulose on their anterior margins; and one of the denticules of the inferior margin of the terminal joint is more prominent than the others.

If the Australian specimen does not belong to *G. elegans*, it may be referable to *G. longirostris*, Dana*, from the Fijis, which is very incompletely known, which it resembles in the minute serrulation of the carapace and rostrum and the shorter fingers of the chelipedes, which are not, however, less than half the length of the palms, as in Dana's description.

In more than one of the specimens in the Museum collection the rostrum is slightly deflexed, and I think it probable that *G. deflexifrons*, Haswell (Cat. p. 163), from Albany Passage (*H.M.S. 'Alert'*), should be regarded merely as a marked variety of *G. elegans*.

23. **Munida spinulifera.** (Plate XXXI. fig. B.)

This species is evidently nearly allied to *Munida japonica*, Stimpson; and it will suffice here to allude to the distinctive characters and some other points not mentioned in Stimpson's description. As in *M. japonica*, the anterior part of the gastric region is armed with a transverse series of thirteen spinules. On the sides of the carapace, at a short distance behind the spine at the outer orbital angle, is usually a single small spinule (whereas Stimpson, in his description of *M. japonica*, says, "Regio gastrica superficie utrinque trispinulosa"). On the front of the branchial regions, just behind the cervical suture, is another small spinule not mentioned by Mr. Stimpson. The lateral margins of the carapace have about seven spinules, inclusive of the outer orbital spine, which is rather long.

The median spine of the rostrum (in the specimens I have examined) is considerably more than twice the length of the lateral spines, and is arcuated, with scarcely any trace of lateral denticulations. The second postabdominal segment has several spinules on its upper surface on the anterior margin. The merus, carpus, and penultimate joints of the ambulatory legs are spinulose; the spinules on the penultimate joints usually developed only on the posterior (or inferior) margins.

Three specimens, of which one (the only one having a chelipede) is a male, the two others females with ova, were obtained in the Arafura Sea, 32–36 fms. (No. 160).

In the specimen of *M. japonica* from the Corean Straits, referred to in my Report on Capt. St. John's collection†, not only are the lateral frontal spines relatively much longer (half the length of the

* Crust. in U.S. Explor. Exped. xiii. p. 482, pl. xxx. fig. 11 (1852).
† Proc. Zool. Soc. p. 51 (1879).

median spines, as in Stimpson's description), but the median spine is itself arcuated and very distinctly denticulated on the lateral margins as well as on the dorsal surface, and there are two spines on the front of the branchial regions. Nevertheless a sufficient series of specimens might perhaps hereafter show the Australian to be a mere variety of the Japanese form.

In the absence of the supraocular spines these species resemble the American genus (or subgenus) *Galathodes*, A. M.-Edwards*, but the corneæ of the eyes are considerably dilated, and the dactyli of the ambulatory legs (in *M. spinulifera*) are not strongly spinulose. Of all the numerous American species of *Munida* described by A. M.-Edwards (*t. c.* pp. 47–52) the nearest allies to *M. spinulifera* are apparently *M. iris* and *M. irasa*, from which *M. spinulifera* is distinguished by having the first two segments of the postabdomen armed with several spinules &c.

24. **Mastigochirus quadrilobatus**, *Miers*.

Seven specimens were collected in Prince of Wales Channel, 5–7 fms. (No. 150), which scarcely differ from the type from the Philippines in the British-Museum collection except in having the median frontal lobes generally somewhat more acute. A careful comparison of these specimens with the (previously) unique dried type example shows that the number of joints in the terminal flagelliform portion of the anterior limbs (which are imperfectly seen on account of the hairs with which they are thickly clothed) was understated in the original description; instead of being ten or twelve, they are usually twice as numerous.

MACRURA.

1. **Gebia carinicauda**, *Stimpson*.

Two females are in the collection from the beach at Thursday Island (No. 167). Another in the British Museum was collected by Mr. MacFarlane on the shores of one of the islands in Torres Straits. Stimpson's types were from Hong Kong. These specimens agree very well with Stimpson's description, except that the upper margins of the dactyli of the anterior legs can scarcely be described as carinated. The spinules of the front are almost completely concealed by the pubescence, but are distinctly visible in a lateral view.

In a smaller specimen, also a female and from the same locality, the spinules mentioned by Stimpson as existing above the genital apertures in the third pair of legs (and which are very distinct in the larger examples in the 'Alert' collection) are not developed.

* Bull. Mus. Comp. Zool. viii. p. 53 (1880).

G. carinicauda is nearly allied to, and may prove to be identical with, *G. hirtifrons*, White, which Mr. Haswell (Cat. p. 164) mentions as commonly occurring in sponges at Port Jackson; but in the latter species the spine of the lower margin of the hand (which exists in adult examples of *G. carinicauda*) is absent. I may add that in the type specimen of *G. hirtifrons* the bases of the second, as well as of the third, pair of legs bear a spinule.

2. Gebiopsis darwinii. (Plate XXXII. fig. A.)

The carapace is vertically deep and laterally compressed (as in *Gebiopsis nitidus*, A. M.-Edw.); its sides converge very slightly to the front, which has four median spines on its anterior margin, arranged nearly in a semicircle, and are equidistant, and behind this the lateral margins are denticulated. The carapace is densely pubescent above in front, and its dorsal surface is bordered anteriorly by a suture, which is continued backward nearly as far as the cervical suture, which is deep and well defined. The segments of the postabdomen are nearly smooth, but clothed with a few hairs; the terminal segment slightly transverse, with the posterior margin straight and unarmed. The eyes, which have very short and thick peduncles, are well nigh concealed beneath the front in a dorsal view. The antennules are short, the peduncles scarcely reaching beyond the front, and each bearing two subequal flagella. The antennæ are little longer than the carapace; the slender peduncles reach somewhat beyond the front; the penultimate and terminal joints are short, and clothed above with long hairs; the flagella of the antennæ terminate in a pencil of hairs, and the several joints also bear a few setæ. The chelipedes are subequal and moderately robust; the merus-joints unarmed and somewhat hairy; the hairs longest and most abundant along the inferior margins; the wrists are short, thinly clothed with hair, and having a few minute spinules along their upper margins, of which the anterior one is the most prominent; the palms longer than broad, somewhat turgid, rounded above and below, and thinly clothed with hair, which is arranged in distant longitudinal lines; the fingers are hairy, much shorter than the palms, thickened at base, dentated on their inner margins, with their apices slightly crossed when closed, the upper much curved. The second legs have the under margins of the merus-joints densely fringed with hair, and the last three joints are also hairy; the penultimate joint longer than the preceding, moderately dilated and compressed; dactyli shorter than the preceding joint; the third legs are similar to the second, but the merus is less hairy below, and the propus is shorter; the fourth and fifth legs are much shorter and slenderer than the foregoing, and the last three joints are more or less hairy, the hairs thickest along the inferior margins of the propus. The rami of the uropoda are broad, with the distal margins straight; they about reach to the distal end of the terminal segment of the postabdomen. Colour (in spirit) yellowish white. The length of the largest specimen does not exceed 9 lines (19 millim.).

Seven specimens were collected at Port Darwin at 12 fms (including both sexes); two or three are females with ova. In the last collection from H.M.S. 'Alert' specimens from Singapore are apparently not specifically distinguishable, although presenting some slight distinctions.

From *Gebiopsis nitidus*, A. M.-Edwards *, from the Cape Verds (the type of the genus), this species is distinguished by the somewhat different form of the rostrum, the existence of a spine on the carpus of the chelipedes, the much shorter antennulary and antennal peduncles, &c.

A male from Fremantle, S.W. Australia (*Dr. J. S. Bowerbank*), differs in the form of the rostrum, which is anteriorly deflexed; its margins armed with ten spines in front of the first of the denticules of the sides of the head; of these, four (of which two are longer) are arranged in a semicircle in front, and three, posterior to them, on each side. I would propose to designate this, if specifically distinct, *G. bowerbankii*.

The genus *Gebiopsis* scarcely differs from *Gebia*, except in the greater development of the lower finger of the chelipedes (which thus are perfectly chelate), and is probably to be regarded as a subgenus.

3. **Axius plectrorhynchus**, *Strahl.*

I am somewhat uncertain of the identity of the specimen in the 'Alert' collection with Strahl's type from Luzon, and therefore subjoin the following description:—

The carapace and postabdomen are somewhat membranaceous in texture, as in most species of the genus. The cephalothorax is vertically deep and laterally compressed; the carapace is smooth, without spines, and has the cervical suture distinctly marked. The rostrum is prominent and narrow, concave above between the eyes; it is produced somewhat behind them, and is armed on the lateral margins with five or six teeth; at the base of the rostrum, in the median dorsal line, the carapace rises into an abrupt prominence; both the gastric and cardiac regions are distinctly defined. The postabdominal segments are smooth, the first very small, the rest nearly of equal length; the lateral margins of the second to sixth segments are nearly straight, entire, and are not produced into spines at either the antero-lateral or postero-lateral angles; the terminal segment is quadrate, very little broader than long, a little broader in its proximal than in its distal half, and has its posterior margin straight. The eyes are of moderate length and thickness, and have distinct black corneæ; the antennules are of moderate length, their antepenultimate joints longer than the two following, which are subequal; the two flagella are of equal thickness, with naked joints. The antennæ are shorter than the animal, the antepenultimate joint of the peduncle shorter than the following, and armed beneath with a small spinule; the penultimate joint longer than the last joint; the

* Nouv. Archiv. Mus. Hist. Nat. iv. p. 63, pl. xviii. figs. 4–7 (1868).

joints of the flagella almost naked. The scale at base of the antennæ is acuminate at its distal end, and between it and the peduncle is a strong spine, which is apparently articulated with the antepenultimate peduncular joint. The outer maxillipedes are subpediform, and the joints are hairy on their inner margins. The anterior legs are wanting in the single specimen I have seen; the three following legs have the joints somewhat compressed; the merus and carpus in the second legs are somewhat dilated and fringed below with long hairs, the palm forming with the dactyl a perfect chela, the fingers of which are acute and meet along the inner edges; the following legs are not subchelate; the palm in the third pair is ovate, fringed with short stiff hairs below and on the sides, dactyl very short; in the fourth pair the palm is somewhat slenderer and more elongated, more thickly clothed towards its distal end with plumose hairs; the fifth legs are shorter and comparatively slender and feeble. The postabdominal appendages are biramose, the inner larger than the outer branch. The rami of the uropoda are somewhat indurated and considerably dilated; their distal margins are straight, ciliated, and minutely spinulose, and they reach to the end of the terminal segment of the postabdomen. Colour (in spirit) whitish. Length about 1 inch 4½ lines (35 millim.).

The single example collected, which is, I think, a male, was obtained on the beach between tide-marks at Port Molle (No. 103), and is in very imperfect condition.

Although the anterior legs are wanting in this specimen, there can, I think, be no doubt of its generic position.

4. **Thalassina anomala** (*Herbst*).

To this species probably belongs a female of rather small size from Thursday Island, obtained in the mangrove-swamps (No. 124).

In this specimen the chelipedes are of nearly equal size, and both chelæ are as slender and as much elongated as is the smaller chela in the adult *T. anomala*, and are strongly spinulose on their upper margins.

The examination of this specimen induces me to regard certain small examples (of both sexes) from Borneo, Singapore, and the Indian Ocean which I formerly * referred to *T. anomala*, and which have a more broadly triangulate rostrum, and the upper margins of the wrists and hands of the chelipedes armed with much smaller spinules along their upper margins, as probably referable to a distinct species. White's *T. talpa*, however, is, as I have already stated, probably a young *T. anomala*.

To the localities mentioned in my paper referred to above is to be added Nicol Bay, N.W. Australia, whence the Museum possesses a small mutilated example (*M. du Boulay*).

Perhaps the species described by Hess † from Sydney as *T. maxima* is to be regarded merely as a variety of *T. anomala*.

* Ann. & Mag. Nat. Hist. ser. 5, v. p. 377 (1880).

† Archiv f. Naturgeschichte, xxxi. p. 163, pl. vii. fig. 18 (1865).

5. Alpheus edwardsii.

Athanasus edwardsii, *Audouin, Explic. planches de Savigny, Descript. de l'Egypte, Atlas,* pl. x. fig. 1 (1809).

Alpheus heterochelis, *Say, Journ. Acad. Nat. Sci. Philad.* i. p. 243 (1818); *M.-Edw. Hist. Nat. Crust.* ii. p. 356 (1837); *De Kay, Crustacea in Zool. New York Fauna,* p. 26 (1844); *Gibbes, Proc. Amer. Assoc. Advanc. Sci.* p. 196 (1850); *Kingsley, Bull. U.S. Geol. and Geogr. Survey,* iv. (No. 1) p. 194 (1877); *Smith, Trans. Conn. Acad. Sci.* ii. pp. 23, 39 (1869); *Lockington, Ann. & Mag. Nat. Hist.* ser. 5, i. p. 475 (1878).

? Alpheus armillatus, *M.-Edw. Hist. Nat. Crust.* ii. p. 475 (1837).

Alpheus neptunus, triton, rhode, *and* amphitrite, *White, List Crust. Brit. Mus.* p. 74 (1847), *descr. nullâ.*

Alpheus doris, *White, t. c.* p. 75 (1847), *descr. nullâ.*

Alpheus avarus, *De Haan (nec Fabricius), Crust. in Fauna Japonica,* p. 179, pl. xlv. fig. 3 (1849), *Alpheus bisincisus* on plate.

Alpheus edwardsii, *Dana (nec Milne-Edwards), Crust. in U.S. Explor. Exped.* xiii. p. 342, pl. xxxiv. fig. 2 (1852)?; *Heller, Sitzungsb. der Akad. Wissensch. Wien, math.-nat. Klasse,* xliv. (i.) p. 267 (1862); *Norman, Ann. & Mag. Nat. Hist.* ser. 4, ii. p. 174 (1868); *Miers, Cr. in Zool. 'Erebus' and 'Terror,'* p. 4, pl. iv. fig. 3 (1874), *A. neptunus* on plate; *Hilgendorf, Monatsb. Akad. Berlin,* p. 830 (1878).

Alpheus edwardsii, var. leviusculus, *Dana, t. c.* p. 543, pl. xxxiv. fig. 3 (1852).

Alpheus strenuus, *Dana, t. c.* p. 545, pl. xxxiv. fig. 2 (1852); *Miers, t. c.* p. 5, pl. iv. fig. 2 (1874), *A. doris* on plate; *Monatsb. Akad. Berlin,* p. 831 (1878).

? Alpheus pacificus, *Dana, t. c.* p. 544, pl. xxxiv. fig. 5 (1852), var.?

Halopsyche lutaria, *Saussure, Rev. Zool.* p. 100 (1857).

Alpheus lutarius, *Saussure, Mém. Soc. Phys. et Hist. Nat. Genève,* xiv. p. 461, pl. iii. fig. 24 (1858); *von Martens, Arch. f. Naturg.* xxxviii. p. 139 (1872).

Alpheus bisincisus (*De Haan*), *Stimpson, Proc. Acad. Nat. Sci. Philad.* p. 30 (1860); *Miers, Proc. Zool. Soc.* p. 53 (1879).

Alpheus crassimanus, *Heller, Reise der Novara, Crust.* p. 107, pl. x. fig. 2 (1865), var.?

? Alpheus bispinosus, *Streets, Proc. Acad. Nat. Sci. Philad.* p. 242 (1878).

Alpheus edwardsii *and* A. strenuus, *De Man, Notes from the Leyden Museum,* xxi. p. 105 (1881).

As the very common and widely distributed species which is here referred to the *Alpheus edwardsii* of Audouin has been designated by many different specific names, it may be useful to point out its most salient characters, more especially as Savigny's excellent figure, by which alone the species may be easily identified, is not accompanied by any description. The rostrum is short, acute, and arises from the front margin of the carapace; on either side of it, between the front and supraocular arches, a longitudinal depression extends back on the dorsal surface of the carapace for a short distance, so that the dorsal surface is slightly carinated. The second (exposed) joint of the antennules is longer than the first. The basal scale of the outer antennæ scarcely reaches beyond the peduncle, and is

without or has only a rudimentary spine at base; it narrows somewhat to its apex, which has a small spinule at its outer angle. The larger chelipede (which may be either the right or left) has a massive hand, which is rounded at its proximal end, notched above and toothed below, just behind the bases of the fingers; on the outer and inner surface of the palm, just below the incision in the upper margin, is an irregular shallow depression, that on the inner surface being somewhat of a triangulate and that on the outer surface of a quadrangulate shape; an impressed line, which forms the posterior margin of the depression of the inner surface, passes obliquely downward to the lower and proximal margin, and upward over the rounded superior margin, whence it is prolonged in a nearly straight line along the upper and outer surface to the rounded base of the upper margin; this line is sometimes nearly obsolete; the mobile finger is rounded and subcarinated above, and is armed on its inner margin near the base with a very prominent rounded tooth or lobe, which fits into a deep pit in the lower (immobile) finger; the smaller chela is slender (in the typical form), without notches, teeth, or sulci; the second joint of the carpus of the second leg is usually a little shorter than the first, the three last joints short, the fifth a little longer than the fourth.

In some specimens the lobe or tooth immediately behind the notch on the upper and lower margins of the large chela is rounded or subacute, in others it is acute.

Eight specimens (males and females) are in the first collection from Port Curtis, 0–11 fms. (No. 92), one (male) from Port Molle beach (No. 95), and two females from Port Denison, 4 fms. (No. 111); a small specimen (No. 123) is without special indication of locality. In the second collection are two small specimens from Thursday Island, 4–5 fms., a female from Dundas Straits, 17 fms. (No. 161), and an adult female from the beach at Port Darwin (No. 176).

There are, besides, specimens in the British-Museum collection from other localities as follows:—North Australia (*Dr. J. R. Elsey*), Port Essington and Rockhampton (*Godeffroy Museum* as *A. brevirostris*, M.-E.). Also from the Red Sea (*Dr. C. Heller*); Gulf of Suez (*R. MacAndrew*); Egypt (*J. Burton*); Zanzibar (*Dr. Kirk*); Seychelles (*Dr. E. P. Wright*); Karachi (*Karachi Museum*); Ceylon (*E. W. H. Holdsworth*); Indian Ocean, Philippine Islands, Bohol (*Cuming*); Japan, Katsura (*Capt. H. C. St. John, R.N.*, the specimens I formerly designated *A. bisincisus*, De Haan); New Hebrides (*J. Macgillivray*); Fiji Islands, Nairai (*H.M.S. 'Herald'*); Samoa Islands, Upolu (*Rev. S. J. Whitmee*); Tahiti (*Mus. Godeffroy*, as *A. pacificus*, Dana); Sandwich Islands (*W. H. Pease*). Specimens from the island of Trinidad (*R. J. Lechmere Guppy*) and the west coast of Central America (*Capt. Dow*) seem to be scarcely specifically distinguishable *.

The males may be distinguished from the females by the form of

* The series of specimens in the British-Museum collection, extensive though it be, does not fully exhibit the ascertained range of this species. According to

the smaller chela of the first pair of legs. In the females the fingers are slender, straight, and acute, and scantily pubescent; in the males the dactyl is relatively broader, subspatulate in form; toward the distal extremity the lateral margins are closely and densely fringed with hairs, which pass in an oblique line over the sides of this joint, and meet on its dorsal surface immediately behind its acute apex. Among the males the form of this (the smaller) chela is subject to considerable variation; sometimes (as in Dr. Heller's Red-Sea specimen in the Museum collection) it is, as stated above, smooth and entire, without notches or *sulci*, but it often exhibits a gradual approach in form to the larger chela in having the upper margins more or less distinctly notched, and even occasionally in exhibiting traces of distinct depressions on the outer and inner surface. As the two varieties appear to pass into one another by almost insensible gradations, I have not ventured to distinguish them by name. Of this latter form there are specimens from the Gulf of Suez, Karachi, Samoa, and Shark Bay, West Australia (*F. M. Rayner*, H.M.S. 'Herald'), in the Museum collection. Among the Shark-Bay specimens (preserved dry) in the Museum collection one, which is apparently a female, has a slight indentation on the lower margin of the smaller chela.

Specimens from China (*Gen. Hardwicke*) in the Museum collection are further distinguished by having a small spinule on either side of the mobile finger at the distal end of the upper margin of each chela. These have been designated by White *A. chiragricus*, M.-Edw., whether rightly or not I cannot determine.

In certain specimens I have observed that the interocular portion of the rostrum is somewhat elevated and subcarinated, as in the form from the Nicobars designated *A. crassimanus* by Heller*, which may perhaps be a mere variety of *A. edwardsii*. Dr. Heller notes a difference in the form of the smaller chelipede in *A. crassimanus* exactly resembling that I have described above as occurring in *A. edwardsii*. This character, I may add, seems to be alluded to by Hilgendorf † in his remarks upon *A. strenuus*; but if so, that author was not aware of its being a mere sexual distinction, but apparently supposed it to be a good specific character. It is also mentioned by De Man, who, although regarding *A. strenuus* and *A. crassimanus* as distinct species, regards the difference in the form of the smaller hand as probably sexual ‡.

In the British-Museum collection are specimens of what appears to be a distinct but closely-allied species from the Fiji Islands, Totoya (*H.M.S. 'Herald'*), and Sandwich Islands (*W. H. Pease*),

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S. I. Smith (*t. c.*) it ranges from N. Carolina southward to the Abrolhos (Brazil), and Lockington mentions its occurrence on the Lower Californian coast and at Realejo on the west coast of Nicaragua (as *A. heterochelis*); Dr. F. Richters records it from the Mauritius.

* Reise der Novara, Crustacea, p. 107, pl. x. fig. 2 (1865).

† Monatsber. der Akad. Wissensch. Berlin, p. 831 (1878).

‡ 'Notes from the Leyden Museum,' xxv. p. 105 (1881).

which is distinguished by having a small but well-developed spinule on the outer side of the antennal scale at base, and the fingers of the smaller chelipede slender, arcuated, considerably longer than the palm, thickly clothed with long hair on their inner margins, and having between them an interspace when closed. In the adult the fingers are sometimes elongated to a remarkable degree, three times as long as the palm in one specimen. This form I propose to designate *Alpheus gracilidigitus*.

Crangon monopodium, Bosc *, is very possibly this or an allied species. As, however, it is impossible to identify that author's brief description and rude figure as given in his second edition (1830) with any species with certainty, and as his designation has never been adopted by any subsequent writer, I prefer to retain Audouin's name *A. edwardsii*, about which there is no uncertainty and which has been used by several authors of repute. I have never seen the first edition of Bosc's work.

Both the *Alpheus edwardsii*, as described by Dana from Cape-Verd specimens, and the *A. pacificus*, Dana, from the Sandwich Islands, differ in having the second joint of the carpus of the second pair of legs much shorter than the first joint, but are probably mere varieties of the typical *A. edwardsii*.

The species I described from the Samoa Islands as *A. lineifer* † is allied to *A edwardsii*, but may be distinguished by the smoother chelipede and the existence of a well-developed spine on the outer side of the peduncles of the antennæ. It may perhaps be the young of *Alpheus parvirostris*, Dana, from the Balabac Straits; but the first joint of the carpus of the second pair of legs is relatively shorter, and the large chela of the first pair relatively narrower and more elongated than in Dana's figure.

6. **Alpheus obesomanus**, *Dana*.

A small example from Port Molle, 5–12 fms. (No. 118), is referred to this species.

Several small specimens are in the British-Museum collection from Ovalau, Fijis (*H.M.S. 'Herald'*). Dana's types were also from the Fiji Islands. Dr. F. Richters has recently recorded this species from the Mauritius (Isle des Fouquets).

This species is remarkable on account of the turgid form of the larger chelipede and the great elongation of the second carpal joint of the second pair of legs.

7. **Alpheus gracilipes**, *Stimpson*.

I thus designate a specimen from Port Molle, obtained on the beach (No. 95), and another small example from Flinders Island,

* Hist. Nat. Crust. ii. p. 96, pl. xiii. fig. 2 (1802).
† Ann. & Mag. Nat. Hist. ser. 4, xvi. p. 343 (1875).

which differ from the specimen doubtfully referred to *A. gracilipes*, from Capt. St. John's Corean collection, in the British Museum* only in having the inferior margins of the merus-joint of the larger chelipede distinctly serrated and its upper margin bluntly angulated at the distal end, whereas in the Corean specimen the inferior margins are nearly smooth and the upper margin ends in a distinct spine. A specimen from Ceylon (*E. W. H. Holdsworth*) is somewhat intermediate in these characters. Nothing is said regarding the form of this joint by Stimpson in his original description. I may add that both the Japanese and Australian specimens differ from Stimpson's description, founded on examples from Tahiti, in having the first joint of the carpus a little shorter than the second.

8. Alpheus minor, var. neptunus.

Alpheus minus, *Say, Journ. Acad. Nat. Sc. Philad.* i. p. 245 (1818); *M.-Edwards, Hist. Nat. Crust.* ii. p. 356 (1834); *De Kay, Zool. New York Fauna, Crust.* p. 26 (1844); *White, List Crust. Brit. Mus.* p. 75 (1847); *Gibbes, Proc. Amer. Assoc. Advanc. Sci.* p. 196 (1851); *Kingsley, Bull. U.S. Geol. Survey*, p. 190 (1878).

? Alpheus formosus, *Gibbes, t. c.* p. 196 (1851).

Alpheus neptunus, *Dana, U.S. Expl. Exp.* xiii. *Cr.* i. p. 553, pl. xxxv. fig. 5 (1852); *Stimpson, Proc. Acad. Nat. Sci. Philad.* p. 31 (1860), var.

Alpheus charon, *Heller, Sitz. Akad. Wissensch. Wien*, xliv. i. p. 272, pl. iii. figs. 21, 22 (1862); *Crust. in Reise der Novara*, p. 107 (1865), var.

Alpheus minor, *Lockington, Ann. & Mag. Nat. Hist.* ser. 5, i. p. 472 (1878).

Three specimens, of which two are females with ova, were obtained at Thursday Island, 4–5 fms. (No. 165).

A small specimen is in the British-Museum collection from Port Jackson, between Bell's Head and Goat Island (*J. Brazier*).

To this species also are referred specimens from the Gulf of Suez (*R. MacAndrew*), Karachi (*Karachi Museum*), and Ceylon (*E. W. H. Holdsworth*), besides three specimens presented by T. Say, and therefore of typical value, from East Florida.

Dana's types were from the Sooloo Sea, and Stimpson records it from Ousima and Hong Kong.

I can find nothing, either in the descriptions of authors or in the specimens I have examined, to warrant the specific separation of the Oriental from the American species. The ocular spines and rostrum are, however, somewhat shorter and more triangulate in the Floridan examples than in the Oriental form; and as Kingsley notes a similar distinction between specimens occurring on the Eastern and Western American coasts, I retain Dana's name for the Oriental variety. On the American coasts it is recorded by Kingsley from North Carolina to the Bermudas on the east, and at Pearl Islands Bay, off Panama, on the west.

* *Vide* Proc. Zool. Soc. p. 55 (1879).

9. **Alpheus comatularum**, *Haswell.*

Since Mr. Haswell's description of this species is brief, it may be of service to subjoin the following, which was drawn up before his Catalogue came to hand:—

The body is smooth; carapace with the sides nearly straight and the antero-lateral angles appearing right angles in a dorsal view. The rostrum is very long, reaching nearly to the end of the peduncles of the antennules, vertically compressed and acute; it has a dorsal keel, which is prolonged backward to the gastric region of the carapace, which is rather convex; the supraocular spines are long and acute, but not half as long as the rostrum. The lateral margins of the second to sixth segments of the postabdomen terminate in small spines in the males; in the females the third to sixth segments are laterally acute; in the males the first, and in the females the first and second segments have their lateral margins broadly rounded. The terminal segment is about twice as long as broad, with four spines on its upper surface (two on either side of the middle line) and four at its distal end (two on either side of a slightly prominent median lobe). The eyes are completely concealed beneath the carapace; the penultimate and antepenultimate joints of the antennulary peduncles are of about equal length, the last joint a little shorter; the longer of the two flagella is about as long as the carapace, with ciliated joints; outside of the peduncles is a flattened spine, which reaches to the middle of the penultimate peduncular joint. The terminal joint of the peduncle of the antennæ is much elongated, the preceding joint very short; the flagella robust and hardly as long as the body; the basal scale is shorter than the peduncle, bipartite at its distal end, the outer lobe spiniform and acute; there is a small external basal spine, below which is another larger spine. The larger chelepide (either the right or left) has a slender merus-joint, which is armed with a small spinule at the distal end of its upper margin; the carpus (in both) is extremely short, armed above and below with a strong spine; palm subcylindrical, elongated, smooth, without notches, rounded above and below, with a small spinule at the distal end of its upper margin; fingers each with a blunt rounded tooth on its inner margin, the upper dilated laterally, compressed and carinated above. In the smaller chelipede the palm is slender, the fingers incurved at the tips, the dactyl much longer than the lower finger and strongly arcuated. In the second legs the last joint of the carpus is slightly longer than the three preceding joints (which are very short); the following legs are moderately robust, and terminate in small curved claws. The rami of the uropoda are rounded, ciliated, and very minutely granulated at the distal ends, the outer somewhat the larger; their basal portions are armed with a spine above. Colour (in spirit) yellowish or pinkish; an adult female with ova is a deep brown-pink. Length of an adult female nearly 1 inch 2 lines (30 millim.), of its large chelipede about $9\frac{1}{2}$ lines (20 millim.); the males are somewhat smaller.

Two females were obtained at Albany Island, 3-4 fms., whence also it is recorded by Mr. Haswell, and a small male at Warrior Reef (first collection); also an adult male from Prince of Wales Channel, 7–9 fms., and three from Thursday Island, 4–5 fms. (No. 165), from the second collection.

Specimens are in the British-Museum collection from Ceylon (*E. W. H. Holdsworth*), and I have also seen examples from Singapore (in the collection of A. O. Walker, Esq.).

The remarkable development of the rostrum and orbital spines and the form of the antennal scale serve to distinguish this species.

According to Mr. Haswell (Cat. p. 189), whose description of this and several other of his new species was based on specimens obtained by H.M.S. 'Alert,' it is invariably found clinging to the arms of a species of Comatulid, to which its markings give it a general resemblance. The carapace is marked with longitudinal stripes of brownish purple, with a narrow median white line, which is continued on the first two postabdominal segments; at the sides are three short white markings, the abdomen has broad brownish-purple and narrow white lines, bases of antennæ purple, longitudinal stripes of purple on the ambulatory legs; large hand marked with longitudinal lines of light brown, bordered by narrow darker bands.

10. **Alpheus villosus**, *M.-Edw.*

An adult example is in the collection from Warrior Reef (first collection), and two specimens (one of small size) from Thursday Island, 3–4 fms. (No. 177), in the second collection.

A female with ova from the Australian coast (without special indication of locality) is in the Museum from the collection of Dr. J. S. Bowerbank.

To the characters given by Milne-Edwards I may add that there exists a small spinule on the outer margin of the first exposed joint of the antennulary peduncles. The larger chela is vertically very deep at its base, but narrows towards the fingers; the smaller one is pubescent, but without *sulci* or spinules; the fingers quite as long as the palm.

11. **Pontonia (Conchodytes) tridacnæ**, *Peters.*

A large series of specimens was obtained at Warrior Reef, at from 10–16 fms. (No. 137), together with specimens of *Pinnotheres villosulus*, which inhabited "pearl-shells;" whether the *Pontonia tridacnæ* had the same habitat is stated to be uncertain. By far the greater number of the specimens collected were females with ova. In the full-sized examples the second pair of legs are very much larger and more robust than in the specimen figured by Dana (the only one he had seen), having the palm robust and elongated, rounded above and below, and the fingers less than half the length of the palm, the mobile finger strongly carinated above, with a tooth

or lobe on its inner margin, which fits into a cavity between two smaller teeth on the inner margin of the lower finger. These characters are, however, less marked in specimens in which the second legs are less developed, and there are one or two examples in which the chelæ scarcely differ in form and proportions from Dana's figure; hence I have not ventured to regard the species as distinct.

A specimen, dried and very imperfect, which probably belongs to this species, is in the British-Museum collection from Keppel Island, Port Curtis, obtained within the shell of a live *Pinna* (*J. Macgillivray*, H.M.S. 'Rattlesnake'), others from the collection of H.M.S. 'Herald,' from the interior of *Tridacna* (without indication of locality), and others from Matuka and Ngau (*H.M.S. 'Herald'*). In all the specimens from the 'Herald' collection the second pair of chelipedes are less developed, as in Dana's figure of this species, which was based on a specimen from Tutuila, in the Samoan or Navigator group (Crust. U.S. Expl. Exp. xiii. p. 571, pl. xxxvii. fig. 1, 1852).

It appears very doubtful whether the *P. maculata*, Stimpson*, from *Tridacnæ* obtained at Bonin, can be regarded as distinct from *P. tridacnæ*, from which it is only distinguished by Stimpson by its elongated form and slenderer rostrum; the rostrum is, however, described as reaching only to the penultimate joint of the antennulary peduncles (and hence shorter than is usual in *P. tridacnæ*) and truncated at apex.

The genus *Conchodytes*, established for this species by Dr. Peters, can, I think, scarcely be regarded as generically distinct from *Pontonia*; but the name may perhaps be conveniently retained as a subgeneric designation for *P. tridacnæ* and the allied species. Dr. Hilgendorf, who had the opportunity of examining Dr. Peters's type, distinguishes it from *Pontonia* merely by the shorter antennal flagellum†; but the flagellum in *P. macrophthalma* (which Dr. Peters himself supposes to belong to *Conchodytes*) is represented as being much longer. (See M.-Edwards, Atlas in Cuvier's 'Règne Animal,' Crustacés, pl. lii. fig. 3.)

12. **Harpilius inermis.** (Plate XXXII. fig. B.)

Body not compressed, smooth, and dorsally rounded, and without spines either on the carapace or postabdomen. Rostrum spiniform, rounded and smooth above, longer than the eye-peduncles, rather broad at base, appearing acute at apex in a dorsal view, without spinules or teeth on its upper or lower margins; it is laterally somewhat compressed, and in a lateral view its apex is rounded. The terminal postabdominal segment is rounded above, but narrows considerably towards its distal end, which bears several setæ; the lateral margins are unarmed. The eye-peduncles project laterally and are of moderate size; the antennulary peduncles project slightly

* Proc. Acad. Nat. Sci. Philad. p. 38 (1860).
† Sitzungsb. der Akad. Wissensch. Berlin, p. 835 (1878).

beyond the rostrum and bear two flagella, whereof one is considerably thickened and is bipartite at its extremity; the antennal peduncles are short, with the last joint longer than the preceding; their basal scales ovate, much longer than the peduncles, and without spinules; rounded and ciliated at the distal ends; the flagella are shorter than the animal, with the joints nearly naked; the two last joints of the outer maxillipedes are slender, setose, and together little longer than the antepenultimate joint, which, like the preceding, is moderately dilated. The anterior legs are slender, with the wrist elongated and about twice as long as the palm and fingers taken together; the second chelipedes, although larger than the preceding, are yet slenderer than in many allied forms; the joints are without spines; the right leg a very little more robust than the left; the merus or arm about as long as the ischium and little longer than the carpus, which is rounded above and below and not half as long as the palm; the palm is smooth, rounded above and below, very slightly compressed; the fingers rather more than half the length of the palm, with thin inner edges, incurved and acute at the tips, and each armed with a tooth near the base on the inner margin, that of the dactyl being the larger; in the left chelipede the teeth are not developed. The three following legs are slender, unarmed, and terminate in a small simple curved claw. The uropoda reach a little beyond the distal end of the terminal postabdominal segment; their bases are armed above with a spine; the rami are ovate and ciliated, the outer a little broader than the inner. Colour (in spirit) light yellowish. Length of the single specimen (a female) about 10 lines (21 millim.), of second chelipede about 7 lines (15 millim.).

The second specimen was found in the interior of a shell of a species of *Pinna*, obtained on the coral-reefs at Port Molle, and bears ova.

This species in its general appearance and in many details, as in the edentulous rostrum, ovate antennal scales, and the form of the chelipedes, bears a striking resemblance to *Anchistia aurantiaca*, Dana*, from the Fijis, but differs in the form of the outer maxillipedes and of the dactyli of the ambulatory legs, in which it rather resembles *Harpilius*. As this is the only spirit-specimen, I have not ventured to dissect the buccal organs to ascertain the absence of a mandibular palpus; but there can, I think, be little doubt that this species is rightly placed with *Harpilius* and *Anchistia*.

There is in the British-Museum collection a dried example from Shark Bay, W. Australia (*F. M. Rayner*, H.M.S. 'Herald'), which probably belongs here. This specimen also was found in the interior of a *Pinna*-shell.

Another closely allied species exists in the Museum collection, represented by a single dried specimen from the interior of *Tridacna* (*H.M.S. 'Herald'*), without precise indication of locality, which differs in the form of the rostrum (which appears acute in a lateral view), and in having a spine on the anterior margin of the carapace

* U.S. Expl. Exp. xiii. Cr. i. p. 581, pl. xxxviii. fig. 2 (1852).

above the scale of the external antennæ, which is armed with a spinule at its antero-external angle. This I propose to designate *H. spinuliferus*.

13. **Anchistia petitthouarsi**, *Audouin*?

The carapace, with its rostrum, is shaped nearly as in *Palæmon*; the terminal postabdominal segment is narrow, with four spines on its upper surface, placed close to the lateral margins, and terminates in two long mobile spines and three smaller spines. There is a supraorbital spinule situated on each side of the rostrum, between it and the eyes and just behind the anterior margin of the carapace, also an antennal spine outside of the eyes, and one (the branchiostegal?) placed below the eyes and behind the anterior margin. The rostrum is longer than the peduncles of the antennæ, nearly straight, has six teeth on its upper and four on its lower margin, and is bidentate at apex; the last tooth of the series is situated in the median dorsal line of the carapace behind the anterior margin. The eyes are, as in *Leander*, of moderate size and project laterally. The antennules have the antepenultimate (?) joint of the peduncles dilated, laminate, and vertically compressed, with a small spinule at its antero-external angle; the two following joints are short and slender and terminate in two flagella, of which the thicker is shortly bifid at its apex, the other is broken. The antennal scale is much elongated, narrow, nearly reaching to the apex of the thicker antennulary flagellum, and completely concealing (in a dorsal view) the peduncles of the antennæ; it is ciliated on its inner margin and at its apex, and has a spinule at its antero-internal angle; the antennal flagellum is about as long as the animal. The outer maxillipedes are subpediform, with the antepenultimate but little thicker than the last two joints, the penultimate longer than the last joint. The anterior legs (or chelipedes) are very slender, with the wrist as long as the palm and fingers together; the second legs are slender, but thicker than the preceding; merus-joint with a small spine at the distal end of its inferior margin; the wrist, which is little longer than the palm, is also armed with a spine at its distal extremity; the palm is very slender, nearly terete, and about as long as the fingers; these latter are without teeth on the inner margins, and have the tips slightly incurved. The ambulatory legs are slender and clothed with a few distant hairs; the penultimate joints very long; the dactyli slender, styliform, nearly straight, and not half as long as the preceding joints. The bases of the uropoda have a small spinule at the distal end of the outer margin, and there are two subterminal spinules on the outer margin of each outer ramus; the rami are subovate (as usual) and ciliated at the distal extremity and along the inner margins; the outer somewhat broader than the inner ramus. Colour (in spirit) whitish. Length nearly 10 lines (21 millim.).

The unique specimen (a female with ova) was obtained at Port Molle on the beach (No. 98).

I regard the *Anchistia grandis* of Stimpson, from Ousima*, as synonymous with *Anchistia petitthouarsi*.

The differences in the proportions of the second legs in our specimen and that described by Mr. Stimpson may perhaps be due to sex. Stimpson does not mention the number of the teeth (if any) on the inferior margin of the rostrum in his example; but as he says "*A. ensifronti* affinis," it may be presumed that, as in Dana's species, there are three teeth on the inferior margin of the rostrum, and also that there is, as in that species, a supraocular spine.

Anchistia inæquimana of Heller is, according to Kossmann†, also synonymous with *A. petitthouarsi*. It is remarkable that neither in the figure of Savigny, nor in Heller's long description of *A. inæquimana* in the 'Beiträge zur Crustaceen-Fauna des rothen Meeres,' can I find any indication of the supraocular spine; so that our specimen may after all belong to a distinct species.

14. **Coralliocaris? tridentata.** (Plate XXXII. fig. C.)

The body is rounded above and not compressed: the anterior margin of the carapace bears a strong spine outside of the eye-peduncles and above the basal antennal scale. The rostrum is short, not reaching to the end of the peduncles, and has three spiniform teeth on its upper margin; its lower margin is entire; the apex curves gently upward and is acute. The segments of the postabdomen are without spinules; the terminal segment has four small mobile spinules on its upper surface near the lateral margins, and the somewhat rounded apex is tipped with a few short setæ. The eyes are rather short, robust, and reach about halfway to the apex of the rostrum. The antepenultimate joint of the peduncles of the antennules is about as long as the two following taken together; these are short and of equal length; the longer flagellum is broken in the single specimen examined, the shorter is slightly bipartite at its distal end. The basal antennal scales are shorter than the peduncles of the antennules, rounded and ciliated at the distal ends, and with a very small spinule on the outer margin. The antepenultimate joint of the outer maxillipedes is very little longer and broader than the penultimate joint, which about equals the terminal joint in length. The anterior legs (the left only is perfect) are very slender; the wrist much exceeds the hand in length, the slender palm about equals the fingers. Of the second legs also only the left is perfect; this limb has the joints smooth and unarmed, the merus longer than the carpus, which is less than half the length of the palm, which is much shrivelled, but its lower margin appears to have been carinated; the fingers are less than half the length of the palm, acute at their apices, and without teeth on their inner margins. The third legs are robust, with the merus and penultimate joints compressed; the dactyl minute, curved, and with a minute tooth on the lower margin. The following legs are imperfect.

* Proc. Acad. Nat. Sci. Philad. p. 39 (1860).

† Zool. Ergebn. Reis. roth. Meer. ii. p. 83 (1880).

The rami of the uropoda are somewhat longer than the terminal segment, ovate, the outer somewhat broader than the inner. Colour (in spirit) purplish brown. Length about $7\frac{1}{2}$ lines (16 millim.).

The single specimen, a female with ova, was obtained at Thursday Island, 4–6 fms. (No. 130), and is in very imperfect condition, the right chelipede of the first and second pair and most of the ambulatory legs being deficient. Nevertheless the species may be distinguished from all described by Dana, Heller, or Stimpson by the different dentition of the rostrum. On account of the minute dactyl with its inferior tooth I refer this species to *Coralliocaris*; but it differs from the typical species in the slenderer maxillipedes and shorter antennal scales.

15. Palæmon (Leander) intermedius, *Stimpson.*

Three specimens, two of which are females with ova, were obtained at Port Jackson, 0–5 fms. (first collection). Stimpson's specimens were also from Port Jackson.

Specimens are in the British-Museum collection from King George's Sound, S.W. Australia, and from Ovalau, Fiji group (*F. M. Rayner*, H.M.S. 'Herald'), and also from Tasmania.

This species usually has eight teeth above and five below, exclusive of the subapical tooth on the rostrum, and more rarely seven above and four below, as stated by Stimpson. The apex is usually, but not invariably, bidentate; in one of the specimens from Port Molle the subapical tooth is placed further back on the dorsal surface of the rostrum, which thus appears simple at its apex. There is a small spine at the base of the antennal peduncles outside of the antennal scale.

I regard the *Palæmon (Leander) serenus* of Heller*, from Sydney, as very probably a mere variety of *P. intermedius*. Mr. Haswell (Cat. p. 195) retains the two species as distinct; but he appears to have seen no specimens, and his translated descriptions are inaccurate as regards the second pair of legs in both species.

16. Sicyonia ocellata, *Stimpson.*

A small specimen is in the second collection, from Thursday Island, 4–5 fms. (No. 165), which agrees with Stimpson's description and the specimens in the British-Museum collection from Ceylon and Hong Kong. To this species also belongs, I think, the *Sicyonia* briefly characterized by Mr. Haswell, but without specific name, from Port Jackson (*vide* Cat. p. 205).

17. Penæus granulosus, *Haswell.*

A small male from Port Darwin, 12 fms. (first collection), belongs here, and also, I think, a male specimen from Thursday Island,

* 'Reise der Novara,' Crust. p. 110, pl. x. fig. 5 (1865).

4–6 fms., in Dr. Coppinger's second collection (No. 130), which has the terminal postabdominal segment broken.

These specimens, although males, have a distinct dorsal carina on the carapace, in this particular agreeing with Mr. Haswell's description of the female and differing from the specimens he regards as the males of this species.

P. granulosus comes very near to *P. monoceros*, Fabricius, which species, however, has no lateral spines on the margins of the terminal segment.

18. **Penæus velutinus**, *Dana*.

Here are referred two specimens (one of which is an adult male) from Port Darwin, 12 fms.; a specimen from Albany Island, 3–4 fms.; and a small example from Thursday Island, 4–5 fms.

For remarks upon the specific characters and geographical range of this widely-distributed species, I may refer to my paper on Crustacea from the coast of Senegambia* and memoir on the Penæidea†.

I may add that in *P. velutinus* there are present an antennal and hepatic spine, and a third spine (the branchiostegal?) situated on the anterior margin of the carapace below the eye-peduncles; also usually a minute supraorbital spinule or denticle, or a notch indicative of its position, in the anterior margin.

19. **Penæus batei.** (Plate XXXII. fig. D.)

The carapace and postabdomen are covered with a very short close pubescence as in *P. velutinus*. The carapace has scarcely any traces of *sulci*, and has a well-developed antennal and a small hepatic spine; also a very small pterygostomian spine or spinule. The rostrum scarcely reaches beyond the ends of the peduncles of the antennules; it is scarcely prolonged at all backward as a median longitudinal dorsal crest; its distal extremity curves slightly upward and is acute; its lower margin is entire; its upper margin is armed with two teeth placed just in front of the anterior margin of the carapace; behind these, on the gastric region of the carapace, is a rudimentary tooth. The third to sixth segments of the postabdomen are carinated in the dorsal median line; the carina on the sixth segment ends in a small spinule on the posterior margin of this segment. The terminal segment is slightly longer than the preceding, narrow, longitudinally carinated above, and terminates in a strong spine, on either side of which are three lateral spines, of which those nearest to the distal extremity are smaller and placed immediately above the preceding. The eyes are large, much more dilated than their short peduncles. The terminal joint of the peduncles of the antennules is shorter than the preceding; the flagella subequal and very short, not so long as the peduncles. The

* Ann. & Mag. Nat. Hist. ser. 5, viii. p. 367 (1881).
† Proc. Zool. Soc. p. 304 (1878).

peduncles of the antennæ are very short, completely concealed beneath the large basal scales, which reach slightly beyond the antennal peduncles, narrow to their apices, and have a small spinule at the distal ends of their outer margins. The outer maxillipedes are rather robust and elongated, reaching, when thrown forward, almost to the apices of the antennal scales. The first legs are much shorter than the following, with the joints compressed, the dactyli acute, and the basus and ischium-joints have each a small spine at the distal ends of their inner margins; the second and third chelipedes are slender (the basus-joint of the second legs bears a small spine); the third are longer than the second; the fourth legs are slender and rarely as long as the third; the fifth are imperfect. The rami of the uropoda are narrow, and reach about to the end of the terminal segment; the outer has the lateral margins nearly parallel; in the inner ramus they converge very slightly to the rounded extremity. Colour (in spirit) purplish beneath the cinereous pubescence. Length about 2 inches 10 lines (72 millim.).

The unique example (a female) was obtained at Albany Island in 3–4 fms.

The palpi of the mandibles are two-jointed; the joints flattened, dilated, and ciliated, as in *Penœus*.

As the specimen is unique, I have not been able to make a complete examination of the branchiæ; but I think (as in the true *Penæi* as restricted by Mr. Spence Bate) no true podobranchiæ are present, but merely the epipoditic appendages or "mastibranchiæ" as he denominates them *.

There are, besides, in the collection from Port Denison a specimen closely allied to *Pasiphœa* and to *Leptochela*, Stimpson; and another crustacean, perhaps belonging to the Penæidea, which, being in very mutilated condition, cannot be described in detail, and which I leave for the present undetermined.

* *Vide* Spence Bate "On the Penæidea," Ann. & Mag. Nat. Hist. ser. 5, viii. p. 174 (1881).

In this recent memoir on the Penæidea several new genera and not a few new species have been very briefly characterized, to none of which, I believe, can our new form be referred. The descriptions, however, are insufficient. From *Hemipenæus*, which this species resembles in its short and few-toothed rostrum, it differs in the structure of the flagella of the antennules.

Mr. Spence Bate includes in the very insufficiently defined genus *Penæopsis* the *P. styliferus*, M.-Edwards, with which he apparently considers *P. dobsoni*, Miers, to be identical. He has strangely overlooked an important distinction, twice mentioned by me in my paper (*vide* Proc. Zool. Soc. 1878, pp. 305, 307), namely the absence of lateral marginal spinules on the terminal postabdominal segment. They are absent, I may add, alike in the female and in Prof. Wood-Mason's small male. The existence of these in *P. styliferus* is mentioned by Milne-Edwards in his original description of that species, and they are present also in a specimen referred to *P. styliferus* in the British-Museum collection.

STOMATOPODA.

1. Squilla nepa, *Latr.*

A small male is in the collection from Port Darwin, 7–12 fms. (No. 173).

For remarks on the geographical distribution, and an enumeration of localities whence the British-Museum collection possesses examples of this common and widely-distributed species, I may refer to my revision of the group *.

Since its publication specimens have been added to the National Collection from W. Borneo †.

2. Gonodactylus chiragra (*Fabr.*).

Two small males are in the collection from Port Molle (beach, No. 98) in the first collection, and one from the beach at Thursday Island (No. 167) in the second collection, of larger size.

Since I referred to the distribution of *G. chiragra* in 1880, specimens both of this species and of *G. graphurus* have been added to the collection from various Malayasian localities ‡; and of *G. chiragra* also from Ceylon (*Dr. W. Ondaatje*).

Dr. Kossmann § confidently identifies this very common species with the *Cancer falcatus* of Forskål ‖, whose name, having priority over that of Fabricius, would displace the almost universally adopted designation *G. chiragra*, if the identification be correct. But I am inclined to think that Forskål's description may not improbably have been based upon a specimen of the almost equally common *G. graphurus*; the words (used of the terminal segment) "in medio scuti gibbus, elatus, hemisphæricus, carinis longitudinalibus, convexis, pone mucronatis numero quinque" will apply better to the latter form, on the supposition that Forskål overlooked the small outermost pair of lateral prominences; in *G. chiragra* but three dorsal carinæ are distinctly developed, and these, in the adult at least, are not mucronate. Under these circumstances it will be better, perhaps, to retain the accepted designations than to run the risk of further unnecessarily complicating the synonyms by applying Forskål's doubtful name to either species.

3. Gonodactylus graphurus, *White* (ined.), *Miers.*

Specimens of this widely distributed species, which appears to be very abundant on the N.E. Australian coasts, are in the collection

* Ann. & Mag. Nat. Hist. ser. 5, v. pp. 25, 118, 120 (1880).
† *Vide* 'Annals,' *t. c.* pp. 458, 459.
‡ *Vide* 'Annals,' *t. c.* p. 459.
§ Malacostraca, in 'Zool. Ergebn. einer Reise in Küstengeb. des roth. Meeres,' p. 100 (1880).
‖ 'Descriptiones Animalium,' &c. p. 96 (1775).

from Port Molle, obtained on the beach (No. 92), at 5–15 fms. (No. 118), and 14 fms. (No. 93). Some of these (No. 95) are adult males of large size. Also a small female from Port Denison, 4 fms. (No. 111). All of the above are from Dr. Coppinger's first collection. Also a small male from Clairmont Island (No. 151), and two specimens from Thursday Island—a female from the beach (No. 167) and a male from a depth of 4–5 fms. (No. 165)—in the second collection.

ISOPODA.

1. Ligia gaudichaudii, var. australiensis, *Dana*?

Here are somewhat doubtfully referred several specimens obtained on the beach above high-water mark at Port Molle. Dana's brief diagnosis was based on imperfect specimens in which both the antennæ and uropoda are wanting; and as Mr. Haswell had seen no specimens of this species, and therefore adds nothing to our knowledge about it in his Catalogue, the following description may be useful:—

The body is oblong-oval, moderately convex, but little laterally dilated. The head is transverse, with its anterior margin convexly rounded, without any median rostriform point, its upper surface granulated and transversely sulcated, one of the *sulci* running parallel to the posterior margin, and others bordering the posterior margin of the eyes. The segments of the thorax are rather indistinctly granulated above; the postero-lateral angles of the first segment are nearly right angles, those of the second and third slightly more acute, those of the fourth to seventh segments acute and posteriorly prolonged, yet not to so great a degree as in some species of the genus. The segments of the postabdomen are nearly smooth above in the middle line, but granulated on the sides, and have as usual the postero-lateral angles acute and produced; the postero-lateral angles of the penultimate segment scarcely reach more than halfway to the apex of the corresponding angle of the terminal segment. The terminal segment is longer than the preceding; the posterior margin has a very slight median prominence, and a rather deep notch close to the postero-lateral spine; the margin of the notch, although sometimes slightly sinuated, is not dentated as in *L. gaudichaudii*; the postero-lateral spine is short and scarcely reaches beyond the level of the posterior margin. The eyes are very large, black. The minute antennules are not visible in a dorsal view. The antennæ are shorter than the animal, and have the penultimate and terminal joints of the antennæ slender and elongated, the terminal longer than the preceding joint; the three preceding joints are robust and much shorter; the flagellum composed of 26–30 joints; the joints of the legs are clothed with short stiff *setæ*, which are most abundant on the inferior margins of the four last joints; below the terminal claw is a second small subterminal one on all the legs. The terminal joint of the stem of the uropoda

is somewhat elongated, trigonous, and has a small spinule at its distal end; the rami are subequal and longer than the base, yet not greatly elongated as in some species. The colour (in spirit) is yellowish, usually closely and somewhat irregularly punctulated with black. Length of the largest example about 8 lines (17 millim.); breadth nearly $3\frac{1}{2}$ lines (7 millim.).

These specimens very nearly resemble examples referred to *L. gaudichaudii* from Madjica-Sima in the Museum collection; but the body is less distinctly granulated, and the granulations do not generally extend over the median dorsal line of the postabdominal segments, and the notches of the terminal segment are not distinctly toothed. In one specimen, however, I have observed a continuous line of granules bordering the posterior margins of the postabdominal segments.

In the uncertainty that exists regarding the true nomenclature of not a few species of this genus, I prefer to retain the name of *australiensis* as a designation for this variety. Mr. Thomson* has described a species from Dunedin, New Zealand (*L. quadrata*), which is evidently nearly allied to the *L. australiensis*, but may, perhaps, be distinguished by the less prominent postero-lateral angles of the last postabdominal segment, which is described as "subquadrate, with the angles hardly projecting."

2. Ceratothoa imbricata.

Oniscus imbricatus, *Fabr. Mantissa Insect.* i. p. 241 (1787).
Cymothoa imbricata, *Fabr. Ent. Syst.* ii. p. 503 (1793); *Suppl.* p. 304 (1798).
Cymothoa banksii, *Leach, Dict. Sci. Nat.* xii. p. 353 (1818); *Desmarest, Consid. Crust.* p. 309 (1825); *M.-Edwards, Hist. Nat. Crust.* iii. p. 273 (1840); *Heller, Reise der Novara, Crust.* p. 148 (1865).
Cymothoa trigonocephala, *M.-Edwards* (*nec Leach*?), *Ann. Sci. Nat.* sér. 2, iii. pl. xiv. figs. 1, 2 (1835); *Crust. in Cuv. Règne Animal*, pl. lxv. fig. 2; *Hist. Nat. Crust.* iii. p. 272 (1840), var.; *Guérin, Icon. Crust. Règne Animal*, pl. xxix. fig. 2 (*after Milne-Edwards*).
Ceratothoa trigonocephala, *Heller, Novara Crust.* p. 148 (1865); *Thomson, Trans. New-Zeal. Inst.* xi. p. 233 (1879), var.; *Haswell, Cat. Austr. Crust.* p. 282 (1882), *after M.-Edwards.*
? Cymothoa approximans, *White, t. c.* p. 110 (1847).
Ceratothoa banksii, *Miers, Cat. New-Zeal. Crust.* p. 135 (1876).

A small specimen, presenting no distinctive external sexual characters, is in the collection from Port Jackson, 0–5 fms. It is undoubtedly identical with a somewhat larger specimen from the same locality in the British-Museum collection, taken "from the mouth of a bream." The type example of *C. banksii* (thus designated in the handwriting of Dr. Leach) is of larger size, and is said to have been obtained in the New-Zealand seas; it presents no distinctions which can be regarded as of specific importance, and the description which I have

* Trans. New-Zeal. Inst. xi. p. 232 (1879).

already given of it in the 'Catalogue of New-Zealand Crustacea' will apply equally well to the smaller Australian examples, except that in these latter the eyes are distinct and dark-coloured, the antero-lateral prolongations of the first thoracic segment (in the smallest specimen especially) somewhat narrower at base, and the posterior margin of the terminal postabdominal segment somewhat arcuated*.

The type of Fabricius's *Cymothoa imbricata* is also in the British-Museum collection (from the collection of Sir J. Banks), and I am enabled to identify Leach's species with it with tolerable certainty. The slight notch in the terminal segment mentioned by Fabricius is, I think, merely due to an accident. As White referred Fabricius's *Cymothoa imbricata* to the genus *Nerocila*, and the type, when my New-Zealand Catalogue was published, had not been placed in the general collection of the Museum, I did not then suspect its identity with *C. banksii*. The species in the New-Zealand Catalogue (p. 107) which I designated, after White, *Nerocila imbricata* must be called *Nerocila macleayii*, White having previously used this name for it (*vide* Dieffenb. Voy. New Zealand, ii. p. 268, 1843).

It is not improbable that the original *C. trigonocephala*, Leach, must also be regarded as synonymous with this species; nevertheless, as the type specimens (which are dried and without definite locality) present certain slight distinctive characters, as (*e. g.*) the head is narrower, more distinctly triangulate, with straight sides, and the anterior thoracic segment proportionately longer than is usual in *C. imbricata*, I keep them provisionally distinct (*cf.* Ann. & Mag. Nat. Hist. ser. 5, v. p. 463, 1880). To ascertain the true distinctive characters of the species of this difficult group, a careful revision of the whole subject is needed. Milne-Edwards's description of *C. trigonocephala* in the 'Histoire naturelle des Crustacés' seems to have been drawn up from specimens of a variety having a more obtuse front, and the anterior margin of the first thoracic segment armed with a median lobe or tooth. Specimens presenting these characters are in the British-Museum collection from Shark Bay. Mr. Haswell, in his Catalogue, and Thomson (*t. c.*) merely copy M.-Edwards's description.

I refer specimens in the Museum collection to *Ceratothoa imbricata* from Port Essington (*Haslar Hospital*); Sydney, Murray River (*A. E. Craven*, from the mouth of a salmon-trout); Shark Bay, W. Australia (from a species of *Monacanthus*); Calcutta (designated by White *C. approximans*); and various other specimens without special indication of locality.

3. Cirolana multidigitata, *Dana*.

A small female from Albany Island belongs, I think, to this species.

* The posterior margin in Leach's type is slightly rolled in through the desiccation of the specimen; it should not have been described as "nearly straight."

The inner ramus of the uropoda is less distinctly triangulate than in the specimens in the British-Museum collection from the Philippines and Swan River*. The median lobe of the front is not at all prominent.

Reference to this species is omitted in Mr. Haswell's Catalogue.

4. **Cirolana schiödtei.** (Plate XXXIII. fig. A.)

Body narrow-oblong, microscopically punctulated, convex and smooth, as in *C. rossii*. Head closely encased in the first segment of the body, transverse, with scarcely any indication of a median inter-antennulary rostral point, anteriorly bordered with a transverse groove running parallel to and just behind the anterior margin; there is a similar groove bordering the posterior margin of the eyes. The first segment of the body is longer than the following; the postero-lateral angles of the first four segments are rounded, those of the fifth to seventh segments are right angles. Five or six postabdominal segments are visible in a dorsal view; the first five are very short, the lateral angles of the second to fourth curve backward and are much prolonged and acute or subacute; the terminal segment is widest at base, and beyond this subtriangulate, with the lateral margins converging in a gentle curve to the distal extremity, which is acute or subacute; the margins in their distal half are ciliated and minutely serrated. The eyes, seen laterally, are oblong (as in *C. rossii*); they each occupy rather less than one third of the total length of the front margin of the head, and extend but a short distance over its inferior surface. The antennules reach nearly to, or even a little beyond, the posterior margin of the head; the joints of the peduncle are short, the first two slightly more dilated than the third, the flagellum composed of a great number of very short joints. The interantennal plate ("*lamina frontalis*") lies between the bases of the antennæ, its sides diverge slightly from the base to a point situate between the antennules and antennæ, where it bears a strong tooth; beyond this its distal extremity is acute, and lies between but does not completely separate the antennules. The antennæ about reach to the posterior margins of the fifth body-segment. The first two joints of the peduncles are very short, the third and fourth somewhat longer and robust, the fifth yet longer, but slenderer than the preceding; the flagellum is composed of a great number of joints (50–65). The three posterior epimera have their postero-lateral angles prolonged and acute. None of the legs of the body are ancoral. The ischium- and merus-joints in the first three pairs are dilated and dorsally produced. The margins of the third to fifth joints in all the legs are clothed with stiff setæ; the dactyli in all are but slightly curved. The bases of the uropoda are prolonged at their inner and distal angles into a strong spine; the rami are ciliated on the margins and acute at their apices, the outer much narrower and a little shorter than the inner, which reach a little

* *Vide* Journ. Linn. Soc. xiii. p. 511, pl. xxiv. figs. 6–11 (1878).

beyond the distal extremity of the terminal segment. Colour (in spirit) yellowish white. The length of Dr. Coppinger's largest specimen is little over $8\frac{1}{2}$ lines (18 millim.); but the largest example in the British-Museum collection is of much greater size, measuring not less than 1 inch $2\frac{1}{2}$ lines (31 millim.).

Two specimens were dredged in the Arafura Sea, 32–36 fms. (No. 160).

There are in the British-Museum collection several specimens collected in Torres Straits (*J. B. Jukes*). All of these appear to be of the male sex. The terminal segment (only) is slightly pubescent above.

The mandible closely resembles that of *C. hirtipes* as figured by Milne-Edwards*, in its truncated and strongly dentated apex, sensorial appendage, and triarticulate palpus; the maxillipede is also formed on a precisely similar type to that of *C. hirtipes*.

The form of the interantennal plate, which somewhat resembles that of certain *Ægæ* (e. g. *Ægæ spongiophila*), and of the lateral prolongations of the second to fourth segments of the postabdomen at once distinguish this species from *Cirolana hirtipes*, M.-Edw., and *C. rossii*, Miers, and from *Cirolana* (*Eurydice*) *swainsonii*, Leach, a Mediterranean and West-African form, to which *C. schiödtei* is very nearly allied. *Ægæ novizealandiæ*, Dana, and *Cirolana latistylis* and *orientalis*, all of them forms somewhat insufficiently described, appear to be distinguished by the much more rounded and less triangulate terminal segment, &c. *C. arabica*, Kossmann, to judge from his figures†, is distinguished by the form of the rostrum, terminal segment, and interantennal plate both from this and the following species.

5. Cirolana tenuistylis. (Plate XXXIII. fig. B.)

As this species in many particulars nearly resembles the foregoing, it may suffice here to point out its chief distinctive characters. The interantennal process is narrow-linear, as in *C. rossii* or *C. hirtipes*, but the eyes are subquadrate or somewhat rounded, with very large ocelli, and each occupy less than one fourth of the total length of the front and lateral margins of the head, which has a more prominent median frontal process. The antennules have the first two joints of the peduncle more dilated, the second very short, the third robust, but less dilated than the preceding; the last two joints of the peduncle of the antennæ are shorter than in *C. schiödtei*. The third and fourth joints of the ambulatory legs are considerably dilated and margined with stiff setæ. The inner ramus of the uropoda is much narrower than in *C. schiödtei*, with the sides parallel to near the extremity, which is subacute. The length of the largest specimen is about 7 lines (15 millim.).

A single specimen, I think a male, is in the collection from Prince

* Atlas in Règne Animal de Cuvier, Crust. pl. lxvii. fig. 8.

† Zool. Ergebn. Reis. roth. Meer. ii. p. 114, pl. viii. figs. 7, 11 (1880).

of Wales Channel (7–9 fms.). The antennæ are imperfect. Two specimens, of unknown locality, are in the British Museum from the collection of H.M.S. 'Herald.'

The mandible, in its broad and strongly dentated apex, closely resembles that of *C. schiödtei*.

Cirolana latistylis, Dana, from the Balabac Straits, is very imperfectly described, but appears to be distinguished from this species by the much broader inner ramus of the uropoda.

6. **Cirolana lata**, *Haswell*, var. **integra**.

Three small specimens from Albany Island, 3–4 fms., are referred with much hesitation to this species. In the broadly ovoid form of the body, with its longer first thoracic segment and short postabdomen, they resemble Mr. Haswell's figure and description*; but the terminal postabdominal segment is less acute than in the figure, and there is no tooth upon the inner edge of the inner ramus of the uropoda. I may add, in reference to some points that are not mentioned in Mr. Haswell's description, that the eyes are black and subquadrate, the median rostral point prominent and prolonged between the bases of the antennules to or nearly to the apex of the interantennal plate, which is nearly of the same form as in *C. schiödtei*, but is without a superficial tooth; the apex of the mandible is broad and dentated as in other species of the genus; the basal joint of the antennules is large and considerably dilated; the flagellum of the antennæ (which is short and scarcely reaches beyond the posterior margin of the first body-segment, as in Haswell's figure) is 13–15-jointed.

7. **Rocinela orientalis**, *Schiödte & Meinert*.

A single female is referred here in Dr. Coppinger's collection from Prince of Wales Channel, 7–9 fms., which has lost the inner ramus of both uropoda.

Specimens are in the British-Museum collection from Moreton Bay.

If a male and female from Ceylon (*E. W. H. Holdsworth*) and a male from the Gulf of Suez are correctly regarded as identical with this species (and they do not seem to differ markedly from the Australian examples), this must be a widely distributed Oriental form. A large specimen from the West-African coast (without special indication of locality) comes very near to this species, but has a more acute and prolonged front and posterior epimera, and differs slightly in the proportionate length of the joints of the antennæ and antennules, and may be distinct. Messrs. Schiödte and Meinert's types were from the Philippines and Calcutta.

Mr. Haswell has described a species, *Rocinela vigilans*, from Holborn Island, near Port Denison (*vide* Cat. p. 285), which seems

* Proc. Linn. Soc. N. S. Wales, vi. p. 192, pl. iv. fig. 1 (1881); Cat. p. 286 (1882).

in some of its characters to connect this genus with *Cirolana*; it is at once distinguished from *R. orientalis* by the form of the eyes, which are confluent in the middle line of the head. Specimens are in the British-Museum collection from the north-eastern coast of Australia, but no special indication of locality remains, nor any record as to how they were obtained.

In Dr. Coppinger's specimen, and in that from the Gulf of Suez, the front is somewhat more broadly rounded than in the figure of Schiödte and Meinert (Nat. Tidsskr. p. 395, pl. xiii. figs. 1–2, 1879). In the smaller specimens from Ceylon the antennæ have a fewer (10–12) jointed flagellum. I doubt therefore the constancy of the number of the joints of the antennal flagellum as a character for separating the species; but not having examined specimens of several of the new forms described by Schiödte and Meinert, I will not express myself upon this point with certainty.

There is in the British-Museum collection a species of *Æga* very nearly allied to *Æga cyclops*, Haswell, from Port Jackson, but which seems to be sufficiently distinguished by having the body very coarsely punctulated, the epimera of the fourth to seventh segments only subacute and (the last excepted) scarcely prolonged beyond the posterior margin of the segments; and particularly by the form of the terminal postabdominal segment, which is truncated, not rounded, at its distal extremity; the outer ramus of the uropoda is ovate but not acute, the inner squarely truncated at its distal extremity; the distal process of the peduncle extends considerably beyond the middle of the inner ramus. This species, of which a single male is in the collection from King George's Sound (*F. M. Rayner*, H.M.S. 'Herald'), I propose to designate *Æga meinerti*. In the confluent eyes and the form of the terminal segment it somewhat resembles the North-European and Arctic *Æga crenulata*, Lütken, but the posterior prehensile limbs are without the cultriform process characteristic of that species and *Æga webbii*.

8. **Cymodocea longistylis.** (Plate XXXIII. fig. C.)

Convex oblong-ovate, as usual in the genus. Head and first three segments of the body indistinctly punctulated; the fourth to seventh segments granulated, the granules arranged in two transverse series, and most distinct on the two posterior segments. First segment of the postabdomen with a transverse line of granules (like those of the thoracic segments, but larger) and with other granules posterior to it, and with a prominence on either side of the middle line on its posterior margin; terminal segment also very distinctly granulated and somewhat hairy, and with two elevated prominences on its upper surface, behind which, and near to the distal extremity, is a much less elevated and more rounded prominence; terminal notch quadrangular, and with an oblong distally truncated median lobe. The median frontal process is subtriangulate; the postero-lateral angles of all the segments of the body are acute, except those of the

last segment, which are broadly rounded. The eyes are borne on the broadly rounded postero-lateral lobes of the head. The first segment of the peduncle of the antennules is about twice as long as broad and considerably dilated; the second joint, which is small but moderately dilated, is received into a cavity at the distal end of the first joint; the flagella about 14-jointed. The peduncular joints of the antennæ are slender; the flagella about 20-jointed. The ambulatory legs are very slender; the merus, carpus, and propus or penultimate joints margined inferiorly with short stiff hairs, and, as in other species of the genus, the dactyli bear a small subterminal accessory claw. The rami of the uropoda are narrow, entire, nearly straight, and rather densely hairy; the outer rather shorter than the inner ramus, and more acute at its distal extremity; the inner long, projecting by about half its length beyond the terminal segment. Colour (in spirit) yellowish white. Length a little over 4 lines (9 millim.).

A single mutilated specimen was obtained on the beach at Thursday Island, Torres Straits, and is evidently a male, the ventral genital stylets being very distinctly developed. Two males are in the Museum collection without special locality (*J. B. Jukes*), and some specimens from Singapore received in the final consignment of H.M.S. 'Alert.'

I cannot identify it with any of the Australian species of this genus recently described by Mr. Haswell. In the granulated segments of the body it resembles *C. bidentata* and *C. coronata*, Haswell, both obtained at Griffith's Point, Victoria, but differs in the armature of the terminal postabdominal segment. There are specimens in the British-Museum collection from Bass Straits (*J. Macgillivray*, H.M.S. 'Rattlesnake') which I refer to *C. coronata*, having the tubercles on the dorsal surface of the postabdomen disposed as in Mr. Haswell's diagnosis, but differing in the acute inner ramus of the uropoda.

C. longistylis is also very nearly allied to the European *C. truncata*, Leach, but is distinguished by the much longer and slenderer inner ramus of the uropoda. However, I am not sure that the examination of a sufficient series would not necessitate uniting the two species.

9. Cerceis bidentata, *M.-Edw.*, var. aspericaudata.

(Plate XXXIII. fig. D.)

Thus is designated with much hesitation a specimen (male) from Prince of Wales Channel, 7 fms. (No. 169). As Milne-Edwards's diagnosis is very brief, I subjoin the following description of the principal distinctive characters presented by the specimen before me:—

The body is convex with the sides straight, and widens gradually to the tail. Head subtriangulate, but with the anterior margin rounded; the rostral lobe is inflexed, and lies between the bases of the antennules; the postero-lateral lobes, which bear the small black

eyes, are but little produced and rounded, and are received into rounded notches in the first segment of the body. The first body-segment is longer than the following; its antero-lateral processes narrow, acute, and prolonged forward along the sides of the head beyond the eyes; the postero-lateral angles of all the segments (the last excepted) are acute, those of the last body-segment are rounded. The postabdomen is divided into two portions, the anterior of which is minutely punctulated and bears on each side two lateral sutures, indicative of coalescent segments; the posterior (or terminal segment) is granulated, subtriangulate, with two low rounded elevations on its upper surface; its distal extremity has a rather deep and narrow and somewhat triangulate notch. The basal joint of the peduncle of the antennules is much enlarged, longer than broad, its distal extremity is excavated, and its distal and inferior angle is prolonged into a spine which reaches nearly to the extremity of the following joint, which is also dilated, but shorter than the preceding; the very slender flagellum is 12–14-jointed; the four exposed joints of the peduncle of the antennæ are slender, but little more dilated than the joints of the flagellum, which are 14–16 in number. The fourth to sixth joints of the ambulatory legs are slender and margined with very short hairs. The rami of the uropoda are rather large and dilated, reaching beyond the distal end of the terminal segment, and with the exterior and distal angles acute and somewhat produced (especially in the outer ramus, which is rather the larger). Colour (in spirit) yellowish white, minutely speckled with black. Length nearly 6 lines (12 millim.).

Our specimen differs from Milne-Edwards's diagnosis in its punctulated and granulated postabdomen and the narrower notch of the terminal segment; the first-mentioned is a character which might possibly be overlooked on an examination with a lens of low power; nevertheless this variety will perhaps prove a distinct species.

The remarkable structure of the antennules serves, I think, to distinguish it generically from the typical species of *Dynamene*, which it resembles in the simply emarginate tail-segment; but it may be found convenient hereafter to separate generically the species with a tridentate terminal postabdominal segment from those in which this segment is simply notched, as has been done in the analogous case of *Cymodocea*; the examination, however, of further material is required to determine this question. Certain species with a tridentate segment closely connect this genus with *Cymodocea*. I may take this opportunity of noting that the *Cymodocea granulata* described by me in 1876* is probably not specifically distinguishable from *Cerceis tridentata*, Milne-Edwards, which species, however, is but very briefly characterized.

* *Vide* 'Catalogue New-Zealand Crustacea,' p. 114, pl. iii. fig. 5 (1876).

10. Cilicæa latreillei.

Cilicæa latreillei, *Leach, Dict. Sci. Nat.* xii. p. 342 (1818); *Desmarest, Consid. Crust.* p. 296, pl. xlviii. fig. 3 (1825).
Næsea bidentata, *Guérin, Icon. Crust. Règne Animal, Atlas*, pl. xxx. fig. 2 (1829–44).
Sphæroma pubescens, *M.-Edwards, Hist. Nat. Crust.* iii. p. 209 (1840), ♀ ?
Næsea latreillei, *M.-Edwards, Hist. Nat. Crust.* iii. p. 218 (1840).
Cymodocea pubescens, *Haswell, Proc. Linn. Soc. N. S. Wales*, v. p. 473, pl. xvii. fig. 1 (1881); *Cat. Austr. Crust.* p. 290 (1882).

The following is a description of the principal distinctive characters of this species, taken from male examples bearing Leach's label in the British-Museum collection:—

The segments of the body and uropoda are covered with a very short stiff pubescence. The head is transverse; the eyes are borne on the rounded postero-lateral lobes, which are encased in notches in the anterior margin of the first thoracic segment; the median frontal lobe is subacute and projects between the bases of the antennules. The first thoracic segment is slightly longer than the following; its antero-lateral processes are acute; the postero-lateral rather blunt, with the posterior margins slightly hollowed out; the second thoracic segment is rounded, but narrowed on the sides; the third and fourth subacute, the fifth less acute, and the sixth and seventh broader and rounded or subtruncated. The dorsal process of the penultimate postabdominal segment is simple, straight, its apex scarcely acute; it does not project far beyond the distal end of the terminal segment, which is rather more distinctly granulated and has on its upper surface two prominences, situated one on each side of the dorsal process of the penultimate segment; the notch in the middle of the posterior margin is rather deep and as broad as deep, and is divided by a median subtriangulate lobe. The basal joint of the antennules is considerably dilated, longer than broad, and is slightly excavated at its distal extremity, where it is articulated with the next joint. The ambulatory legs are slender; and the dactyli are armed below with a small accessory claw. The inner ramus of the uropoda is represented by a blunt lobe or process of the base; the outer ramus is straight, not greatly longer than the base, and usually bears a small tooth on its outer margin. Length 5 lines (nearly 11 millim.).

The female scarcely differs, except in wanting the posterior dorsal process of the penultimate postabdominal segment, and in the subequal rami of the uropoda, the inner or immobile ramus being more developed, and the outer shorter in the adult, usually more acute at its distal extremity, and bearing, as in the male, a tooth on the outer margin. It presents all the appearance of a *Cymodocea*.

I have scarcely any doubt that the *Cymodocea* (or *Sphæroma*) *pubescens* of Milne-Edwards and Haswell are the female of this species. All the specimens in the considerable series before me, with the dorsal process of the postabdomen and rudimentary

inner ramus of the uropoda, have the external genital appendages proper to the male sex, which are not to be found on any of the specimens I regard as the females of this species, several of which, on the contrary, carry ova. In several instances I have found the two forms associated in the same phial in the Museum collection.

I refer to this species the following females in the 'Alert' collection, which may, however, belong to the variety *crassicaudata*, Haswell:—

An adult example from Port Jackson, 5–7 fms. (No. 104), whence also Mr. Haswell records it as *Cymodocea pubescens*; also one from Thursday Island, 4–5 fms. (No. 165). These specimens have the outer ramus of the uropoda acute, with a strong tooth on its outer margin, and closely resemble *S. pubescens* as described by Milne-Edwards.

Smaller specimens are in the collection from Port Curtis, 7 fms., and Albany Island, 3–4 fms., which have the body less pubescent and the postabdomen more distinctly granulated, the rami of the uropoda somewhat shorter, the outer ramus subacute or even obtuse, with the tooth on its outer margin very faintly defined or obsolete.

The rounded elevations on the upper surface of the terminal segment vary much in prominence in this species. In two females from King George's Sound, West Australia, which may belong to a distinct species, they are very prominent, conical, and subacute. An approach to this form is, however, exhibited in one of Leach's types (a male).

A good series of both sexes of *Cilicæa latreillei* from the Australian seas is in the British Museum from the collection of the late Dr. J. S. Bowerbank. Unfortunately the exact locality has not been preserved.

Mr. Thomson * has described a species of this genus (as I think) from Dunedin, New Zealand, under the name of *Nœsea caniculata*, which is allied to *C. latreillei*, but distinguished by the broadly truncated process of the first postabdominal segment.

11. Cilicæa latreillei, var. crassicaudata (*Haswell*).

A male and female are in the collection from the Arafura Sea, 32–36 fms. (No. 160), and also a male and two females without special indication of locality (No. 123).

This form comes extremely near to *Cilicæa latreillei*, Leach, and must, I think, be considered a mere variety of it. It is distinguished by the longer, less conical median process of the penultimate postabdominal segment, and the much longer outer ramus of the uropoda, which is not toothed on its outer margin.

I have observed males of the typical form in which the tooth on the outer margin of the outer uropod is obsolete.

There is in the British-Museum collection a specimen from Bass

* Trans. New-Zeal. Inst. xi. p. 234, pl. x. fig. A 7 (1879).

Straits which appears to merit separation at least as a variety, which has the segments of the body, the postabdominal process, and the uropoda covered with a dense golden-brown pubescence; the process of the penultimate postabdominal segment very long, reaching nearly to the extremity of the outer ramus of the uropoda, and obscurely emarginate at its distal extremity; the outer ramus straight, subacute, and entire, the inner represented by a short but distinct process of the base; the notch in the terminal segment deep, with a prominent triangulate median process. This I will designate *C. latreillei*, var. *longispina*. I have observed specimens of the preceding variety which nearly resemble this in the form of the terminal notch with its median lobe. From *Cilicœa tenuicaudata* and *C. crassa*, Haswell, which this form resembles in the greatly elongated postabdominal process, it is distinguished by wanting the two prominences of the terminal segment, and by the entire longer ramus of the uropoda.

Cilicœa antennalis *, from Swan River, is nearly allied to *Cilicœa latreillei*, but may be distinguished by the nearly smooth body, the form of the thoracic segments, which are subtruncated on the sides, the much wider, shallower, transverse notch of the terminal segment, which has a very small median prominence, and the form of the process of the penultimate segment, which projects far beyond the distal end of the last segment, is vertically compressed, rounded at the distal end, and marked with a longitudinal median groove; the median frontal process, which is inflexed and lies between the bases of the antennules, is truncated at its distal end, where it is applied to the anterior margin of the labrum; the basal joint of the antennules is considerably enlarged, more than twice as long as broad, with a small tubercle at the distal end of its upper margin; the next joint, which is about half as long, terminates in two spines below the point of articulation with the slender third joint; ambulatory legs very slender; apices of the uropoda subtruncated and recurved. The type (a male) measures 10 lines (21 millim.) from the front of the head to the end of the postabdominal process.

The genus (or subgenus) *Cilicœa*, I may note in conclusion, is nearly allied to *Nœsa*, Leach, and *Campecopea*, Leach; but the typical species of *Nœsa* have the last segment of the postabdomen simply notched (without a median process), and the penultimate segment armed with two or three dorsal processes or spines, and in the typical species of *Campecopea* the terminal segment is entire. The distinctions between the sexes in this group are so marked that a considerable series is necessary and a careful examination, or distinctions which are merely sexual may easily be taken to be indicative of distinct species or even genera.

* *Nœsa antennalis*, White, List Crust. Brit. Mus. p. 105 (1847) (*ined.*).

12. **Haswellia carnea** (*Haswell*).

Calyptura carnea, *Haswell, Proc. Linn. Soc. N. S. Wales*, v. p. 476, pl. xvii. fig. 4 (1881); *Cat. Austr. Crust.* p. 302 (1882), *nomen genericum præoccupatum.*

A single specimen of this remarkable genus and species is in the collection from Port Jackson.

The name *Calyptura* having been preoccupied in 1843 by Swainson (in the Class Aves), I am obliged to adopt a new generic designation for this species, and would propose to associate Mr. Haswell's name with a type which is certainly one of the most interesting of the many new forms described by him.

The coloration, which is described as crimson by Mr. Haswell, has completely disappeared in the specimen in the 'Alert' collection *.

ANISOPODA.

1. **Paranthura australis**, *Haswell.*

A single specimen, I think a male, is in the collection from Dundas Straits (17 fms.).

I may add the following to Mr. Haswell's brief description:—The anterior margin of the front is bisinuated on either side of the median lobe. The terminal segment is longer than broad, and narrows to its rounded apex. Of the antennules four, and of the antennæ five, joints are visible, besides the rudimentary flagellum. The carpus in all (?) the legs is produced below the inferior margin of the propus or penultimate joint in the form of a blunt lobe or tooth. These characters, which are not indicated in Mr. Haswell's description and figure, render it possible that this specimen may belong to a distinct species.

AMPHIPODA.

In the determination of the Amphipoda of the 'Alert' collection I have generally followed Mr. Haswell in using Mr. Spence Bate's classification †, rather than that more recently proposed by the late Axel Boeck ‡, since the latter author was concerned exclusively with north-temperate and Arctic species, and the characters of the

* In passing from this notice of the Australian Isopods, I may observe that the *Idotea caudacuta*, Haswell, and *I. excavata*, Haswell (Cat. pp. 276, 277), are probably identical, the former with *Idotea peronii*, Milne-Edwards, and the latter with *I. ungulata*, Pallas, as characterized in my recent revision of the group (Journ. Linn. Soc., Zool. xvi. p. 1, 1881).

† *Vide* 'Catalogue of Amphipodous Crustacea in the British Museum,' 8vo (1862).

‡ 'De Skandinaviske og Arktiske Amphipoder' (Christiania, 1872).

numerous generic divisions proposed by him would doubtless require considerable modification in any general systematic arrangement of the group. Of the numerous Australian additions to this Order described by Haswell, but few are in the collections received from Dr. Coppinger.

1. **Ephippiphora kröyeri**, *White*.

Several small specimens from Dundas Straits, 17 fms. (No. 161), one from Prince of Wales Channel, 7–9 fms., and one from Port Denison, 4 fms. (No. 122), are referred to this species. They agree with White's much larger types in the form of the body, the coxæ of the thoracic legs, and particularly in the great development of the postero-lateral lobes of the fourth coxæ, in the broadly rounded basus-joints and somewhat dilated ischia of the three posterior legs, and in other points. White's examples (from Tasmania) are dried, and the first and second legs are now broken, as also the terminal segment in both specimens. In the specimens from the 'Alert' collection the terminal segment is elongated, narrowing slightly to the distal extremity, with the sides straight, and is divided by a narrow median fissure; the imperfect terminal segments in White's types seem to show a similar structure; in this particular they differ from *L. nitens*, Haswell, from Port Jackson. *L. australiensis*, Haswell, has a very close resemblance to *L. kröyeri*, and I should have considered it identical with it, were it not for the probable difference in the form of the terminal segment, since *L. australensis* is only distinguished by Haswell from *L. nitens* by the form of the eyes and the palms and fingers of the second legs.

In the present uncertainty as to the true limits of the genera of this group, I refer to this species under White's original designation *Ephippiphora*. By Boeck this genus is doubtfully considered to be identical with his *Socarnes*, first described in 1870.

Mr. Thomson* records the species from Dunedin, New Zealand (as *Lysianassa kröyeri*); but as he says nothing of the form of the telson or terminal segment, I am not sure of the identity of his specimens with the true *kröyeri*.

2. **Leucothoë spinicarpa**, var. **commensalis**.

Gammarus spinicarpus, *Abildgaard, Zool. Danica*, iii. p. 66, pl. cxix. figs. 1–4 (1789).

Cancer (Gammarus) articulosus, *Montagu, Trans. Linn. Soc.* vii. p. 70, pl. iv. fig. 6 (1804).

Leucothoë articulosa, *Leach, Trans. Linn. Soc.* xi. p. 358 (1815), *et auctorum*.

Leucothoë spinicarpa, *A. Boeck, Skandinaviske og Arktiske Amphipoder*, p. 507, pl. xvi. fig. 5 (1876), *ubi synon.*

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* Trans. New-Zealand Institute, xi. p. 237 (1879).

Leucothoë ? crassimana, *Kossmann, Zool. Ergebn. einer Reise rothen Meeres, Malacostraca*, p. 131, pl. xiii. figs. 9, 10 (1880).
Leucothoë commensalis, *Haswell, Proc. Linn. Soc. N. S. Wales*, iv. p. 261, pl. x. fig. 3 (1880); *Cat. Austr. Crust.* p. 248 (1882), var.

I refer to this species a single specimen from Port Jackson, 0–5 fms. It differs only in the greater length of the superior antennæ from Mr. Haswell's description of *L. commensalis*, these exceeding in length the head and first four segments of the body. It ranges along the whole eastern coast of Australia, from Thursday Island in the north to Western Port in the south.

Mr. Haswell describes this as being one of the commonest Amphipoda of Port Jackson, where it is found within the pharynx of a common large tunicate, in the cavities of large sponges, and in other similar situations. A mutilated specimen is in the Museum collection from this locality, received from J. Brazier, Esq.

It is not without much hesitation that I unite *L. commensalis* with the European *L. articulosa*, yet upon comparison of the Australian specimens of *L. commensalis* with the specimens from Great Britain and Norway in the British-Museum collection I can detect no difference of specific importance. In one English specimen the eyes are reddish, in another Australian example reddish black, and in others scarcely any trace of the pigment remains. There are variations in the length of the antennæ and in the form of the antero-lateral processes of the first segment of the body, and also in the degree of acuteness of the apex of the carpal process of the second pair of legs, which, however, I cannot connect with the geographical habitat of the individuals examined. As, however, the series the Museum possesses is but small, and there are in the national collection no specimens from localities intermediate between Great Britain and Australia, it may be well to consider Mr. Haswell's species as a variety, since there may be distinctive characters discoverable in the colour of the eyes, or in other minor particulars. The eyes in Abildgaard's original description are described as black.

Kossmann's species (*L. crassimana*), from the Red Sea, is only briefly characterized, but the details figured would seem to show that this species is also identical with or very nearly allied to *L. articulosa*.

3. Leucothoë brevidigitata. (Plate XXXIV. fig. A.)

The body is smooth, dorsally rounded and laterally compressed; the coxæ of the first four legs deep, as in allied forms. Head small, with a very small median rostral lobe, its antero-lateral angles rounded and not much produced. The coxæ of the fourth legs are but little longer than the preceding, without any distinct postero-lateral lobe; they are slightly overlapped by the much shorter coxæ of the fifth legs. There is a very small acute tooth at the postero-lateral angles of the first tail-segment; these angles in the second

segment are slightly acute, and in the third segment nearly a right angle; the terminal segment or telson is subtriangulate, entire, longer than broad, with the apex subacute. The eyes are black, somewhat ovate in shape. The antennules scarcely equal in length the head and first two segments of the pereion; they have three joints of the peduncle exposed, the first and second subequal in length, but the first somewhat thicker; the third joint slenderer than the second and about half its length; flagellum 13- or 14-jointed. The antennæ have the first joint (which is only partially visible in a lateral view) short, subspherical, the second very short and not more dilated than the third and fourth, which are elongated; the fourth a little shorter than the second; flagellum about 8-jointed. The first pair of legs (gnathopoda) have their basus-joints moderately dilated, with the posterior margins thin-edged and hairy; ischium and merus very short; carpus considerably dilated, and produced at its posterior and distal angle into a spine, which extends along the posterior margin of the propus and reaches to its distal extremity. The propus or penultimate joint is ovate, the dactyl minute and articulated with it at its distal extremity. In the second legs the carpus is very short, and produced along the posterior margin of the propus for less than half its length: the propus is subovate and large; its posterior margin is armed in its distal half with a series of small granuliform teeth, against which the well-developed dactyl impinges. The third and fourth legs are small and present nothing remarkable; the fifth to seventh have the coxæ small, the basus-joint moderately enlarged and rounded posteriorly; the following joints slender and nearly naked; the fourth and fifth slightly produced at the posterior and distal angles. The three posterior pairs of tail-appendages are biramose, the rami lanceolate and acute; in the posterior pair the outer is a little shorter than the inner ramus. Colour (in spirit) whitish. Length about $7\frac{1}{2}$ lines (16 millim.).

A single specimen was obtained at Thursday Island, 4–5 fms. (No. 165).

This species is distinguished from *L. spinicarpa*, var. *commensalis*, Haswell, and the closely allied species or varieties *L. diemenensis* and *L. gracilis*, Haswell, by the broader, more ovate propus or palm and shorter dactyl of the first legs, and the more regularly and evenly toothed palm of the legs of the second pair. The terminal segment is shorter, less acute, and broader-triangulate than in the specimen I refer to *L. commensalis*.

L. novæ-hollandiæ, Haswell, from Port Jackson, is at once distinguished by the broad truncated palm and the absence of a dactyl to the anterior legs, by the shorter carpal process of the second legs, and by other characters. Our species may be regarded as in some sense intermediate between the first three and the last-mentioned species.

There are mutilated specimens both of *L. novæ-hollandiæ* and *L. brevidigitata* in the Museum collection from Vaucluse Point, Port Jackson (*J. Brazier*).

4. **Melita australis**, *Haswell.*

A male is in the collection from Port Jackson, 0–5 fms., a locality where, according to Mr. Haswell, it is very common.

In this specimen the three anterior postabdominal segments have their posterior dorsal margin armed with six spines; the fourth with two spines, outside of which on each side is a small spinule; the fifth is armed as the fourth, but the median spines are smaller; the telson is divided nearly to its base, with the lobes acute.

The species is very nearly allied to the *Melita setipes*, Dana, from Singapore; but in the absence of specimens for comparison, I do not venture to unite the two forms. *M. setipes* has, according to Dana, but two teeth or lobes on the distal margin of the larger hand of the second legs; *M. australis* has three, but the one nearest the dactylus is very small in the specimen I have examined.

5. **Mœra ramsayi**, *Haswell.*

A male specimen is referred to this species from Port Jackson, 0–5 fms., whence also Mr. Haswell records it; and also one from Prince of Wales Channel, 7 fms. (No. 169). The minute teeth or spines on the posterior margins of the first and second segments of the postabdomen do not extend to the postero-lateral lobes; in the third segment the posterior margins are armed with spinules to or even beyond the postero-lateral angles. There are several small spinules on each side of the median dorsal spine on the posterior margin of the fourth and fifth segments. There is a small notch in the anterior margin of the palm of the smaller leg of the second pair, besides the small defining tooth at the postero-distal angle. These points, which are not mentioned in Mr. Haswell's description, render it possible that this specimen should be regarded as belonging to a distinct variety or species.

6. **Mœra rubromaculata** (*Stimpson*).

To this species are referred two imperfect specimens obtained at Port Molle, 5–12 fms. (No. 118), and one from Dundas Straits, 17 fms. Mr. Haswell also records it from Ports Denison, Stephens, and Jackson. As in these specimens the superior antennæ are imperfect and the posterior uropoda are wanting, their identification with Stimpson's species must remain somewhat uncertain. Accordingly it may be useful to append a description of the specimens, with special reference to some points which are not mentioned in the descriptions already given of this species.

The body is slender; the head not produced at its antero-lateral angles; the coxæ of the first segment of the body have their antero-lateral angles acute and produced somewhat beneath the head. The posterior margins of the five anterior postabdominal segments are armed with a series of minute spinules, which in the first and second

segments and fourth and fifth segments exist only on the dorsal surface, but on the third extend down to the rounded postero-lateral angles; in the second segment the posterior margin above the rounded postero-lateral angles is obscurely dentated. The lobes of the terminal segment are subconical and tipped with one or two setæ. The eyes are oval, but very obscurely seen. The penultimate joint of the peduncles of the superior antennæ is slightly longer and slenderer than the preceding; the third joint, with which the short accessory flagellum is articulated, is very short; the flagella are themselves imperfect; the accessory flagella about 6-jointed. The inferior antennæ are much shorter than the superior; the first peduncular joint little more than half as long as the second, which is about as long as the third; the flagella 12–14-jointed. The first legs are slender and feeble; the merus-joints very small, with posterior acute lobe and tooth; the carpus resembles the propus or palm, having the posterior margin convex, rounded, and hairy; the dactyl is a little more than half as long as the palm. The second legs have the carpus very short, propus considerably enlarged, longer than broad, its distal margin oblique, slightly arcuated, and defined by a small tooth; dactyl slightly arcuated, and closing against the distal margin of the propus. The three posterior legs are slender; the margins of the fourth to sixth joints with a few stiff hairs. The uropoda are biramose, the rami in the penultimate and antepenultimate pairs subequal; the last pair are wanting in the three specimens I have examined.

Another specimen from Port Jackson, 0–5 fms., which I refer doubtfully to this genus (it having lost the head), and which I cannot identify with any known species, has the body smooth and unarmed, the first three postabdominal segments with a small spinule at their postero-lateral angles; the terminal segment has the lobes flattened and subacute distally. The first legs are small, with the carpus and propus posteriorly arcuated, the carpus little shorter than the propus. The second legs have the merus-joint short, but little produced at its postero-distal angle; carpus transverse, dilated in its distal half, which equals the width of the palm at base; palm longer than broad, narrower distally, with the distal margin very oblique, not acute, but presenting a broad surface, against which the strong arcuate dactyl closes, and armed with four spines or lobes as follows—one defining the postero-distal angle, a pair of small spines in front of this, and a rounded lobe below the articulation of the palm with the dactyl. The three posterior legs are rather robust, with the basus-joints not serrated; the merus produced at its anterior and distal angle. The outer ramus of the penultimate and antepenultimate uropoda is slightly shorter than the inner ramus; the rami of the last pair subequal, broader and slightly shorter than the preceding.

This species, which may be designated provisionally *M. crassimana*, is apparently well distinguished by the form and dentition of the palms of the second pair of legs.

There is also in the collection a specimen which may belong to

this genus or to *Megamœra*, from Port Jackson, 5–7 fms. (No. 104), but which, having lost both pairs of antennæ and the terminal segment, cannot be referred to any genus with certainty. It is distinguished from the various species described by Mr. Haswell by the great length of the first legs, which exceed the legs of the second pair in length, and have the merus considerably produced at the postero-distal angle, the carpus about twice as long as the propus and truncated at its distal end, propus posteriorly arcuated, dactyl about half as long as the propus: the legs of the second pair have the merus short, carpus more than half as long as the palm and truncated at its distal extremity; palm or propus considerably enlarged, its distal margin oblique and nearly straight, defined at the postero-distal angle by a small spine, and with a truncated lobe or tooth nearer the base of the dactylus, which is strongly arcuated and does not reach quite to the postero-distal angle of the palm. The coxæ of the four anterior legs are deeper than the segments with which they are articulated. The three posterior legs slender, with the basus-joints little dilated and posteriorly entire, the merus-joints not distally produced into lobes or teeth. The uropoda are biramose, the rami subequal, those of the posterior pair very small, not foliaceous. The segments of the body are without teeth, spines, or spinules. The coloration (in spirit) whitish, the body covered with numerous small black dots.

In the form of the anterior legs and in the coloration it resembles *Amphithoë setosa*, Haswell, from Botany Bay, but differs in the form of the palm of the second leg, and, I suppose, of the posterior uropoda.

7. Megamœra suensis, *Haswell*?

As Mr. Haswell's description is very short and our specimens differ slightly from his figure in the form of the second legs, I append the following description:—Body rather robust; head with a small lateral tooth behind the antero-lateral angles. Coxæ of the first four thoracic limbs deeper than their respective body-segments, the first pair not much prolonged at the antero-lateral angles, which are rounded or subacute. The last thoracic segment and the first and second postabdominal segments have their posterior margins armed with two small dorsal spines; the third is dorsally emarginate but without spines; the fourth has its posterior and dorsal margins armed with two strong triangulate acute lobes or teeth. The first and second postabdominal segments have a small spinule at their postero-lateral angles; the third segment has its postero-lateral angles truncated and armed with three to five teeth; the lobes of the terminal segment, which are subcylindrical, are tipped with a few setæ. The eyes are oval, black. The antennæ are somewhat hairy; the superior antennæ are broken, but exceed the head and thoracic segments in length; the basal peduncular joints are thicker and somewhat shorter than the second joints; the third joints very short; the slender accessory flagellum is composed of three rather

long joints, and is tipped with a pencil of hairs. The inferior antennæ slightly exceed in length the head and first five segments of the body; the basal peduncular joint is very short, the second is slightly longer than the third joint. The first legs (gnathopoda) are very slender and feeble; the merus short, unarmed; the carpus, like the propus, convexly arcuated posteriorly and fringed with hairs; dactyl rather less than half the length of the propus. The second legs have the small and slender merus armed with a posterior spine; the carpus very short, transverse, and equalling the proximal end of the propus or palm in width; the palms, in three specimens examined, are large, similar, and subequal, longer than broad, rounded at base, very slightly broader at the distal extremity; the distal margin, against which the strong arcuate dactyl closes, has a wide shallow notch above the postero-distal angle of the palm, and above this three or four very obscure indications of teeth; the infero-distal angle is not defined by a tooth or spine. The third and fourth legs are very slender, with the dactyli about as long as the preceding joints; the three posterior legs are robust, with the basus-joints posteriorly serrated; the fourth to sixth joints margined with long hairs; the merus-joints widening to the distal margin, which is prolonged into an anterior and posterior spine, the posterior spine being very large; dactyli less than half the length of the preceding joints. The fourth and fifth pairs of uropoda have the slender rami margined with short stiff hairs; the sixth pair have the rami subfoliaceous, rather narrow-ovate and not greatly elongated. Colour (in spirit) light brownish pink. Length (without antennæ) a little over 4 lines (9 millim.).

Two specimens are in the collection from Albany Island, 3–4 fms., and two from Port Denison, 4 fms. (No. 122).

In the dorsally bispinose postabdominal segments this species resembles *Megamœra diemenensis*, Haswell, from Tasmania, but differs from this and all of the other Australian species of *Mœra* and *Megamœra* described by that author (as it appears) in the form of the palms of the second legs, not to speak of other characters. If our specimens should prove to be distinct from *Megamœra suensis*, which is only known to me by Mr. Haswell's very short diagnosis, I would propose to designate them *M. haswelli*.

Mr. Thomson* has recently described a species, *Megamœra fasciculata*, from Dunedin Harbour and Christchurch, New Zealand, which is distinguished from both this and the following species by the non-emarginate unarmed palms of the first and second legs, the first pair being "quite transverse," &c.

8. **Megamœra thomsoni.** (Plate XXXIV. fig. B.)

This species is allied to the foregoing; but the body is somewhat slenderer; the posterior and dorsal margins of the thoracic and postabdominal segments are all of them entire, without spines or

* Ann. & Mag. Nat. Hist. ser. 5, vi. p. 5, pl. i. fig. 5 (1880).

notches, but the posterior and lateral margins of the third segment of the postabdomen are armed with a series of small spinules which do not extend over the dorsal surface, but reach downward to the postero-lateral angles; there are also one or two small spinules or teeth at and near the postero-lateral angles of the first and second postabdominal segments; the eyes are much narrower and (transversely) longer than in *M. suensis*, the first peduncular joint of the inferior antennæ is somewhat longer and slenderer; the wrist and palm of the first legs (gnathopoda) are much more hairy; the spine on the posterior surface of the merus-joint of the second legs is much shorter, the wrist longer, and the palm perhaps rather more slender and hairy, with a less distinctly defined distal notch, behind as well as in front of which are one or two small teeth; the three posterior legs are slenderer, with the distal angles of the merus-joints acute but not prolonged into spines; the rami of the posterior uropoda are subequal, but much longer than in *Megamœra suensis* and less acute. Colour (in spirit) light yellowish brown. Length about 5 lines (11 millim.).

A single specimen was obtained at Albany Island, 4–5 fms., with the preceding species; also two from Prince of Wales Channel, 7–9 fms.; and one from Thursday Island, 4–5 fms. (No. 165).

In the long rami of the posterior uropoda this species somewhat resembles *M. mastersii*, Haswell, from Port Jackson; from which, however, it is distinguished by the larger narrow eyes and the somewhat excavated and less distinctly toothed distal margins of the palms of the second legs; nor does Mr. Haswell mention the spinules of the third postabdominal segment, &c.

From *Mœra rubromaculata*, Stimpson, it is distinguished by the entire non-pectinated postero-dorsal margins of the postabdominal segments, the narrow eyes, and the non-defined distal margin of the palms of the second legs.

It is also apparently very nearly allied to the British *Megamœra semiserrata* and *M. brevicaudata*, Spence Bate, and may be only a variety of one of these species; but in *M. semiserrata* the eyes are represented as less narrow and elongated, and the dactyli of the legs of the second pair are serrated upon the inner distal half, and in *M. brevicaudata* the palm has the inferior margin less distinctly defined and more convex in its distal portion *.

I may note, in conclusion, that Kossmann has described † two species, *Mœra erythræa* and *M. massavensis*, from the Red Sea, which appear to be distinguished from all the foregoing species of *Mœra* and *Megamœra* by the form of the palms of the second legs.

9. **Podocerus australis**, *Haswell.*

Five male specimens were obtained at Port Jackson from weed on the ship's bottom.

* *M. semiserrata* is one of several Amphipoda which it would seem are inaccurately marked in Mr. Spence Bate's Catalogue as represented in the Museum.

† Zool. Ergebn. einer Reise im roth. Meeres, pp. 132, 133, pl. xiv. figs. 1–11 (1880).

This species is very nearly allied to the British *Podocerus falcatus*, Montagu (of which the male is figured by Sp. Bate and Westwood as *P. pulchellus*), and also to *P. validus* (Dana), from Rio de Janeiro, in the form of the legs of the second pair. I have not been able to compare it with specimens of the last-mentioned species. From *P. falcatus* it is apparently distinguished by the inferior antennæ, whose flagellum (in the specimens of *P. australis* I have examined) has a very long stout basal joint which much exceeds the united length of the remaining joints of the flagellum; these are two or three in number, very short, and diminish successively in length.

10. **Caprella æquilibra** (*Say*).

A good series of specimens were obtained from weed on the ship's bottom at Port Jackson with *Podocerus australis*.

Mr. Haswell's examples (designated *C. obesa*) were from Clark Island in the same harbour.

All appear to be males. A conical spine, not mentioned by Mr. Haswell, exists on the ventral surface of the body, between the second pair of legs (gnathopoda).

A female obtained with the foregoing, and which probably belongs to the same species, has the joints of the peduncle of the superior antennæ less dilated and the flagellum more elongated; the basus-joints of the second gnathopoda are less dilated; but one of the distal teeth of the inferior margin of the palm is developed, and this is very indistinct.

I may refer to Dr. Paul Mayer's recently published fine monograph of the Caprellidæ * for the synonyms of this very widely distributed species. There can be no doubt of the correctness of his identification of *C. obesa*, Haswell, with *C. æquilibra* (Say). Say's specimen in the British-Museum collection, although dried and in a somewhat shrivelled condition, does not differ appreciably from our Australian examples, nor from a specimen from the Mediterranean (*Hennah*), and the dried one from Hong Kong (*Harrington*) in the Museum collection, which was identified with *C. æquilibra* by Mr. Spence Bate. Out of three (presumably) British examples in spirit in the Museum collection, designated *C. æquilibra* by Mr. Sp. Bate, one only belongs to this species, and this also does not differ from the Australian examples.

11. **Caprella attenuata**, *Dana*? (PLATE XXXIV. fig. C.)

I refer here with much hesitation a male obtained at Port Jackson with *Caprella æquilibra*. It differs from *C. attenuata* as figured by Dana and by Dr. Mayer (*t. c.* p. 67) in the much more robust

* In 'Fauna und Flora des Golfes von Neapel,' vi. p. 45, pl. i. fig. 7, pl. ii. figs. 1–11, pl. iv. figs. 20–25, pl. v. figs. 16–18 (1882).

and shorter segments of the body and peduncular joints of the superior antennæ, relatively longer inferior antennæ, &c., as a comparison of the figures will show; but as Mayer refers to this species (founded upon types from Rio de Janeiro) specimens sent to him by Mr. Haswell from Port Jackson, and our specimen agrees with Dana's figures of the male in the denticulation of the palms of the second legs and in other characteristic points, I do not venture to regard it as distinct.

Caprella novæ-zealandiæ of Kirk * comes very near this species, but differs in the form of the non-ciliated joints of the flagellum of the superior antennæ, and the penultimate joint of the second legs is armed (apparently) with but two teeth. Both *C. novæ-zealandiæ* and *Protella australis*, which greatly resemble this species, have a spine or tooth on the penultimate joint of the three posterior legs, of which scarcely any indications exist in the specimens I refer to *C. attenuata*.

Two other very small *Caprellæ*, also obtained at Port Jackson, are in the collection, which I am unable to identify with certainty, but do not think it desirable to designate by a distinct specific name.

OSTRACODA.

The few Ostracoda collected were submitted to Dr. G. S. Brady for determination, who referred them to the following species:—

1. Cypridina albo-maculata, *Baird.*

The specimens collected were from Port Darwin, 12 fms., and Dundas Straits, 17 fms. (No. 161). The original types were from Western Australia, Swan River.

CIRRIPEDIA.

1. Balanus trigonus, *Darwin.*

Numerous specimens (mostly small) were obtained at Port Jackson, 0–5 fms. (No. 90). Darwin records it from Sydney, and mentions its distribution through the Malaysian seas and its occurrence at New Zealand and also on the W. coast of the American continent.

2. Balanus amaryllis, *Darwin.*

A specimen from the beach at Port Darwin (No. 176), and several small specimens from Albany Island, 3–4 fms., attached to a shell, appear to belong to this species. In the two largest specimens, however, whose opercula I have examined, the scuta

* Trans. New-Zeal. Inst. xii. p. 393 (1879).

have the articular ridges somewhat reflexed. For its distribution see Darwin's monograph (p. 279), by whom it is recorded from Moreton Bay.

3. Acasta sulcata, *Lamarck*, var.

A single specimen in the collection from Albany Island, 3–4 fms., is very doubtfully referred to this species. It agrees generally in its external characters with Mr. Darwin's description, and also in the broader spur of the tergum of the operculum. In the remarkable reduction of the width of the parietes of the carino-lateral compartments it altogether resembles a specimen from Sydney in Mr. Cuming's collection (now in the British Museum) specially referred to by Mr. Darwin*; but it differs very remarkably in the external armature of the parietes of the other compartments, which are armed with strong, outwardly-projecting, bluntly-triangulate lobes or teeth, one such tooth being situate on each compartment, not very far below the apex, except on the carina, where there are two teeth; thus there are five in all. The cup-shaped basis of the shell is pinkish; the epidermis, which remains upon the basal half of the compartments, bright yellow.

Mr. Darwin (*t. c.* p. 311) mentions some remarkable variations in the external armature of this species, but none which at all resemble the specimen now described. In the very closely allied *A. spongites* the calcareous projections of the shell are often of considerable size, yet not nearly so large as the teeth in the specimen from Albany Island, and much more numerous and irregularly distributed. In the specimen of *A. sulcata* from Sydney, with narrow-linear carino-lateral compartments, the walls of the shell are externally smooth.

* Monograph of Cirripedia, Balanidæ, p. 310 (1854).

PYCNOGONIDA.

BY

E. J. MIERS.

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1. **Achelia lævis, var. australiensis.** (PLATE XXXV. fig. A.)

Body and legs moderately robust, the body disciform, the leg-bearing processes being closely approximated. Proboscis stout, subcylindrical, tapering toward its distal extremity, slightly deflexed. Mandibles rudimentary, 2-jointed, the terminal joint very small. Palpi 8-jointed?; ovigerous legs 10-jointed. Legs without spines, but with a short, blunt, conical process at the distal end of the fourth joint, and with two auxiliary claws beside the normal claw.

As Mr. Hodge's description of *Achelia lævis* (from Polperro, Cornwall) is very insufficient, I append the following from the single Australian example I have examined:—

The body is robust and disciform, with the leg-bearing processes enlarging distally and closely approximated. The cephalothoracic segment (viewed from above) is as long as the three following and is elevated on its dorsal surface, which bears the rounded oculiferous tubercle; the three following segments (in a dorsal view) short and transverse; the first the shortest, almost transversely linear. The proboscis is about as long as the body without the abdomen, obliquely deflexed, and is of a narrow ovoid shape, tapering to the distal extremity. The abdomen about as long as the three preceding segments of the body, and very slender. The mandibles are rudimentary, 2-jointed, the terminal joint about half the length of the preceding. The palpi are apparently 8-jointed (on one side evidently broken); the second and fourth joints subequal and rather long; the first and third and the four last very short. The ovigerous legs 10-jointed; the first joint very short, the second and third longer and subequal, the fourth and fifth yet longer and of about equal length, the sixth to ninth very short, and the terminal joint minute. The first to third joints of the legs are short, the second a very little longer than the first or third; the fourth, fifth, and sixth joints longer and of about equal length; the fourth joint somewhat more dilated than either of the following, and with a slight blunt process at the distal end of its upper margin; the upper surface of the fifth and sixth joints is slightly uneven, but can scarcely be

described as tuberculated; the seventh joint is very short; the eighth slightly curved and nearly as long as the sixth, the terminal claw about half as long as the eighth joint; the two auxiliary claws placed, as usual, above the base of the principal claw. The body and limbs are clothed with a very short, close pubescence, and the joints of the limbs with scattered longer hairs; the last three joints of the ovigerous legs have some rather stronger simple setæ, and the eighth joints of the legs have each a series of three or four spine-like bristles on the under surface near the base.

The single specimen, which is in very imperfect condition, is from Port Jackson. As no traces of the ovary could be seen, I think it is a male.

This specimen resembles the British form designated *A. hispida* by Hodge * (which is probably a mere variety of *A. lævis*) rather than the typical *A. lævis*, as represented in that author's figures, in the form of the rostrum and abdomen, but the leg-bearing processes of the segments of the body are more closely approximated and the animal more densely pubescent than in either form. I do not observe the "circlet of little spines" at the extremity of the first joint of the mandibles mentioned by Hodge in his diagnosis of *A. hispida*. Böhm † refers specimens from Kerguelen Island to this species; but his figure of the palpus differs markedly from the same limb as figured by Hodge in *A. lævis*.

There are in the British-Museum collection two specimens of uncertain British locality, probably referable to *A. lævis*; but they are in a very bad state of preservation, being gummed upon cardboard, and can scarcely be identified with certainty.

It is to be regretted that during the transference of the specimen from spirit to the slide on which it is mounted for the microscope, the eighth joint of the only perfect leg was lost; but the figure, which was outlined while the specimen was yet in spirit, represents with sufficient accuracy the form of this joint.

This species is referable to the genus *Achelia* as limited by Dr. Hoek in his recent Classification of the Pycnogonida ‡.

Dr. Anton Dohrn § has united this genus (with several others) with *Ammothea*, and the distinctions separating these genera are certainly very slight. I think it better, however, having only two species under consideration, to refer them to the genera as characterized by Hoek, his being a complete synopsis of the known genera and species of the group.

2. Phoxichilidium hoekii. (Plate XXXV. fig. B.)

Body robust, with narrow intervals between the leg-bearing processes at base. Proboscis cylindrical, increasing slightly in thickness to its distal extremity, inserted ventrally between the bases of

* Ann. & Mag. Nat. Hist. ser. 3, xiii. p. 115, pl. xiii. fig. 11 (1864).
† Monatsb. der Akad. Wissenschaft. Berlin, p. 186, pl. i. fig. 5 (1879).
‡ Report on the Pycnogonida of H.M.S. 'Challenger,' p. 26 (1881).
§ 'Die Pantopoden des Golfes von Neapel,' p. 134 (1881).

the ovigerous legs. Mandibles 2-jointed, the chelate terminal joint inserted not laterally, but at the distal extremity of the preceding joint. Ovigerous legs 10-jointed. The legs (but not the mandibles) are armed with strong conical spines, and bear two long auxiliary claws besides the normal claw.

Length of the rostrum, a little over	2	millim.
Length of the body (without rostrum and abdomen) nearly	3	„
Length of the abdomen about	1·5	„
Length of leg of the first pair about	21	„

The body is moderately robust (as in *P. fluminense*), with the leg-bearing processes nearly in contact at their bases; the articulations of the segments of the body are discernible only on the ventral surface. The cephalothoracic segment is about as long as the three following segments taken together, and of these latter the first is a little shorter than the second or third. The proboscis, as in *P. insigne*, is inserted ventrally, far back between the bases of the two ovigerous legs, and, as in that species, is very slightly swollen at the base, in the middle, and at the distal extremity; the mouth is small and triangulate, and is margined by three slight protuberances. The abdomen is slender, longer than in *P. insigne*, and directed upwards.

The oculiferous tubercle is conical, subacute, with four dark eyes. Immediately *behind* it the cephalothoracic segment is marked by a median longitudinal depression, extending along nearly its whole length. The basal joints of the mandibles are but slightly divergent and extend considerably beyond the front of the proboscis; they have no indication of the acute process characteristic of *P. insigne* and bear the second joints, which are about half as long as the first, at their distal extremities; the pincers are smooth on their inner surfaces. The basal joints are nearly glabrous. The second joints and the pincers at base are clothed with fine hairs, which are most abundant on the under surface of the second joint.

The ovigerous legs are inserted on either side of the base of the proboscis and are 10-jointed; the first and third joints are short, the second a little longer, the fourth and fifth still longer and of nearly equal length, but the fourth is somewhat thickened, the sixth about as long as the second, the seventh to tenth small, the tenth minute; the last five joints are clothed with fine hairs.

The first joint of the legs is small, nearly as long as the lateral process, the second more than twice as long as the first, the third about half as long as the second; the fourth is about as long as the three preceding joints taken together; the fifth slenderer and a little longer than the fourth; the sixth also slenderer and about as long as the fourth; the seventh is very short; the eighth slightly curved and longer than the first, but not as long as the second joint. The first joint of the leg bears, at the distal extremity of its upper surface, one or two small conical spinules or protuberances, and at the

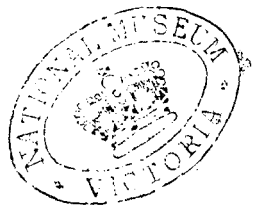
distal extremity of its fourth and fifth joints five protuberances, of which the two outermost are small, and the three inner longer, strong and subacute ; near the middle of the ventral surface of the fourth joint is a small process (as in *P. fluminense*), and a series of minute spinules or protuberances along the upper margin of the fifth joint; the joints also, except perhaps the eighth, are marked with longitudinal impressed lines ; the eighth has a series of spinules on its inferior surface ; besides the terminal claw there are, as already noted, two strong accessory claws. The first to third joints of the legs are scantily clothed with very short hair ; the distal protuberances of the fourth joint and the fifth joints are more thickly clothed with longer hair, and the sixth to eighth joints again with a much finer, more scanty pubescence.

Three specimens are in the collection, obtained respectively at Dundas Straits, 17 fms. (No. 161), Thursday Island, 4–5 fms. (No. 165), and in Prince of Wales Channel, 7 fms. (No. 169). As in these specimens the thigh-joints are not specially dilated and the genital pores are small, I believe them to be males.

This species resembles *Phoxichilidium insigne*, Hoek (*t. c.* p. 82, pl. xiv. figs. 5–7), from Bahia, in the curious distal protuberances of the fourth and fifth joints of the legs, but these are absent from the second and third joints in *P. hoekii*, and our species differs in many other most important points, as (*e. g.*) in the closely approximated leg-bearing processes of the body, the terminally-placed second joints of the mandibles, and the more robust body and appendages. The first-mentioned of these characters will also separate this species from *P. fluminense*, Kröyer (see Hoek, *t. c.* p. 81, pl. xiv. figs. 1–4), from which it is also distinguished by the distal protuberances of the leg-joints &c. The existence of these protuberances separates this species from those other species of *Phoxichilidium* described by Dr. Hoek in which the leg-bearing processes are more or less approximated, and from the two Austral species described by White* as *Nymphon phasma* and *N. johnstonianum*, which Dr. Hoek has shown belong to *Phoxichilidium*. The "points" mentioned by White as occurring at the end of the oints in *N. johnstonianum* are, I may add, only short stiff *setæ*.

* Proc. Zool. Soc. xv. p. 125 (1847).

ALCYONARIA.



BY

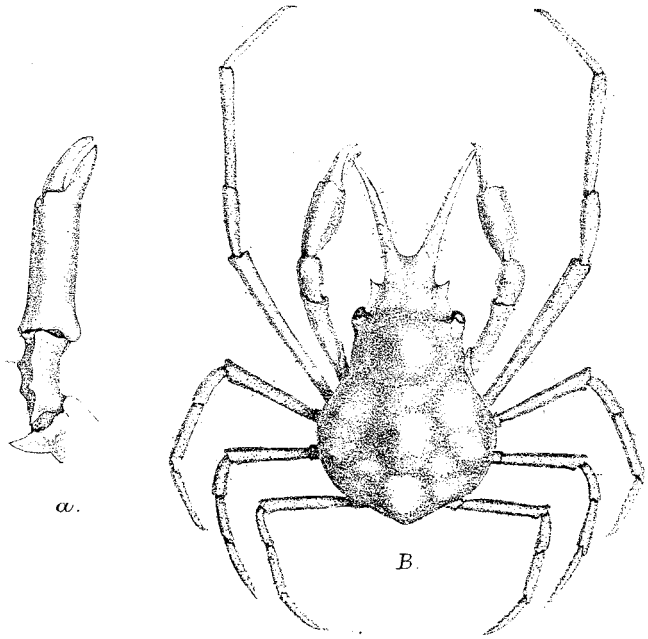
STUART O. RIDLEY.

CONSIDERABLE light has already been thrown from four sources upon the zoology of the Alcyonaria of the northern and eastern parts of Australia—the districts which receive illustration from the present fine collection. I refer to the collection made by Mr. F. M. Rayner in the 'Herald,' that made by Mr. J. B. Jukes in the 'Fly,' in those of the Antarctic Expedition under Sir James Ross and the present Sir J. Hooker, and that by the German circumnavigatory expedition of the 'Gazelle.' In the case of the three British expeditions, the Alcyonaria of chief interest were described by Dr. J. E. Gray in the 'Proceedings of the Zoological Society of London'*, in the 'Annals and Magazine of Natural History'†, and in his 'Catalogue of the Lithophytes or Stony Corals in the collection of the British Museum' (London, 8vo, 1870). The specimens collected by the 'Gazelle' were described by Prof. T. Studer in the 'Monatsbericht der Akademie der Wissenschaften zu Berlin'‡. Studer's is the largest single contribution to the subject, and describes twenty-four species from Australia, but only from western and north-western localities. The information given by the older writers Lamarck, Lamouroux, Milne-Edwards and Haime is almost all open to the great objection of indefiniteness as to locality; the single species definitely described by MM. Quoy and Gaimard as collected by the 'Astrolabe' in Australia is from the south.

The present collection contains thirty-eight species, and may be regarded as giving a good general insight into the character of the Alcyonarian fauna of the shallow waters of the north-east coast of Australia (coast of Queensland, up to and including Torres Straits), and as adding in a most important manner to our knowledge of the same fauna in the north-western part of this continent. I have inserted notes on specimens already in the collection where the localities were known with certainty; in particular a series recently obtained by exchange from the Australian Museum, Sydney, and collected near Port Jackson and on the Queensland coast, has been of service.

Distribution.—The number of localities investigated, and the

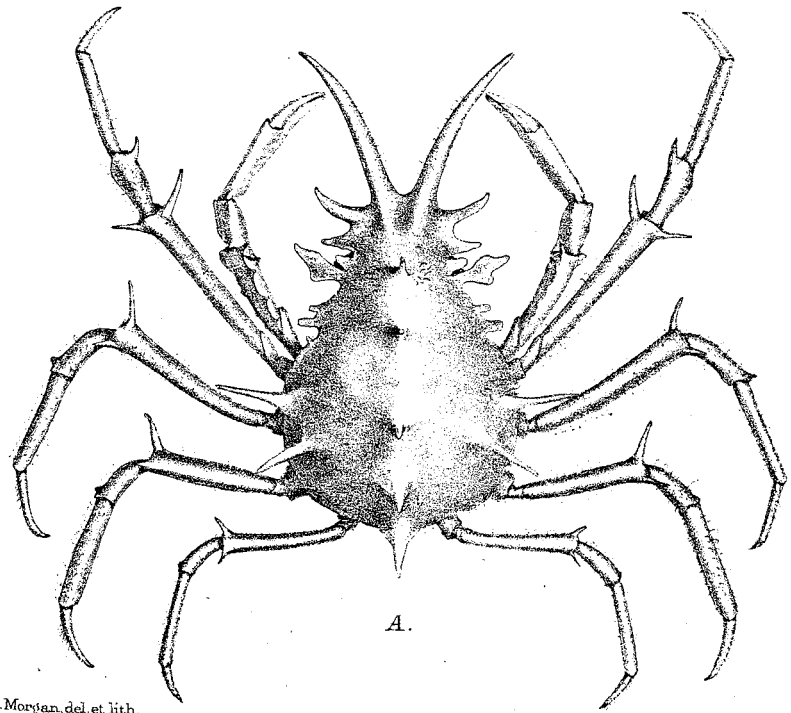
* 1862, pp. 27, 31, 34; 1872, p. 744.
† Ser. 3, vol. v. p. 20; ser. 4, vol. ii. p. 441, iii. p. 21.
‡ 1878, p. 633.



a.

B.

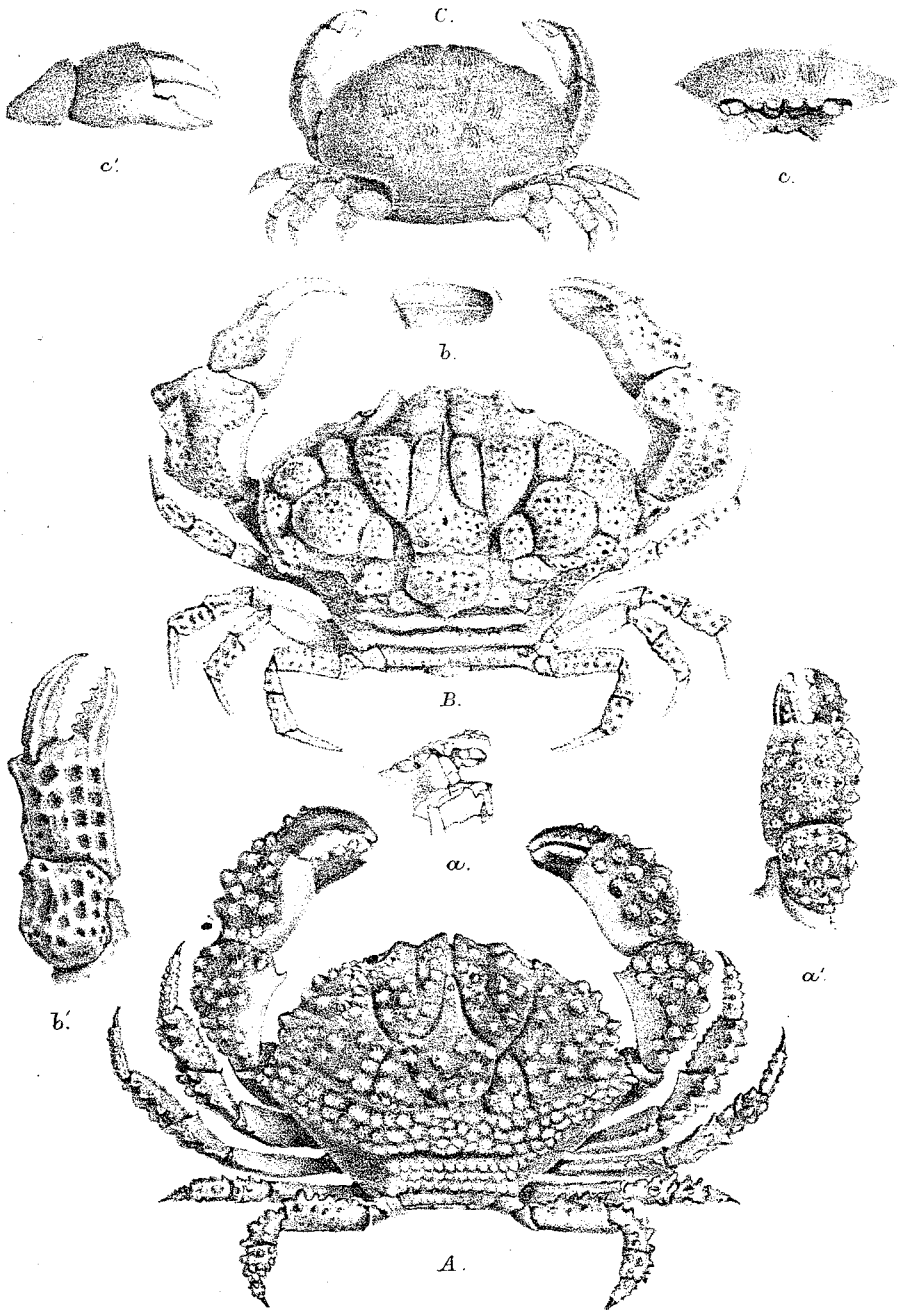
b.



A.

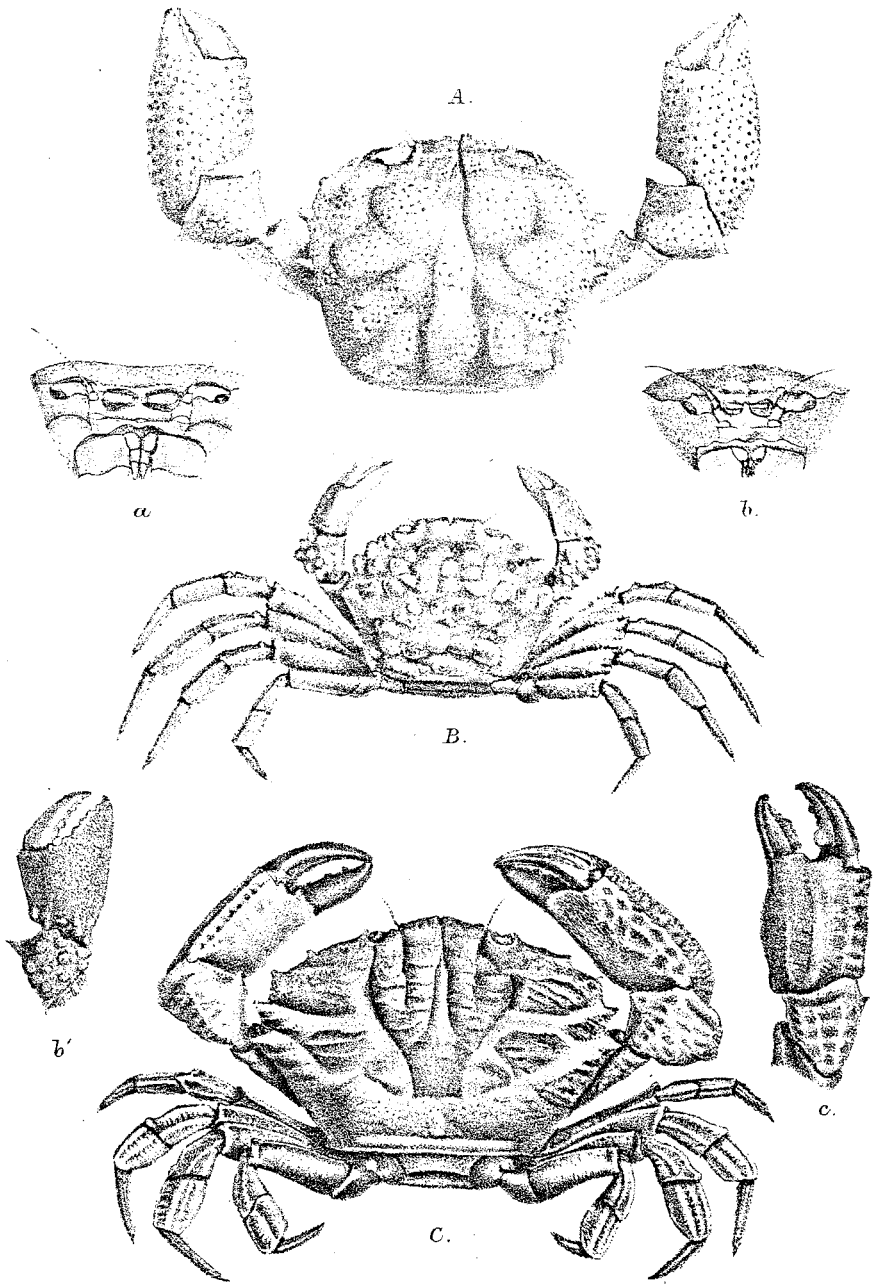
Robt. Morgan, del. et lith. Mintern Bros. imp.

Fig. A. Paramithrax aculeatus, var. armatus.



Robt. Morgan del. et lith. Mintern Bros. imp.

Fig. A. Eucanthus tuberculosus. Fig. B. Hypocoelus punctatus.
Fig. C. Banareia inconspicua.



Robt. Morgan, del. et lith. Mintern Bros. imp.

Fig. A. Galene granulata. Fig. B. Halimede coppingeri.
Fig. C. Xantho macgillivrayi.

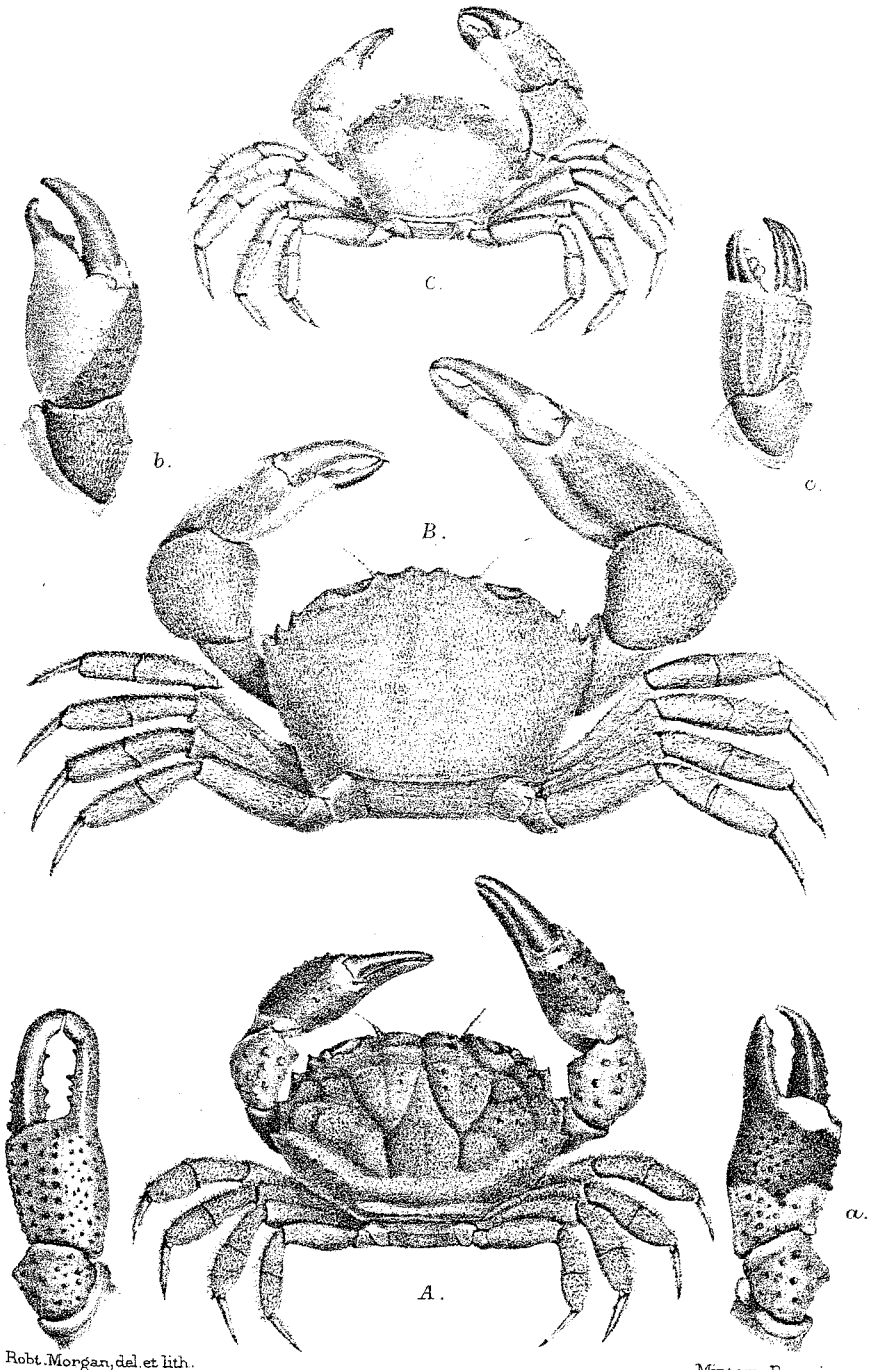


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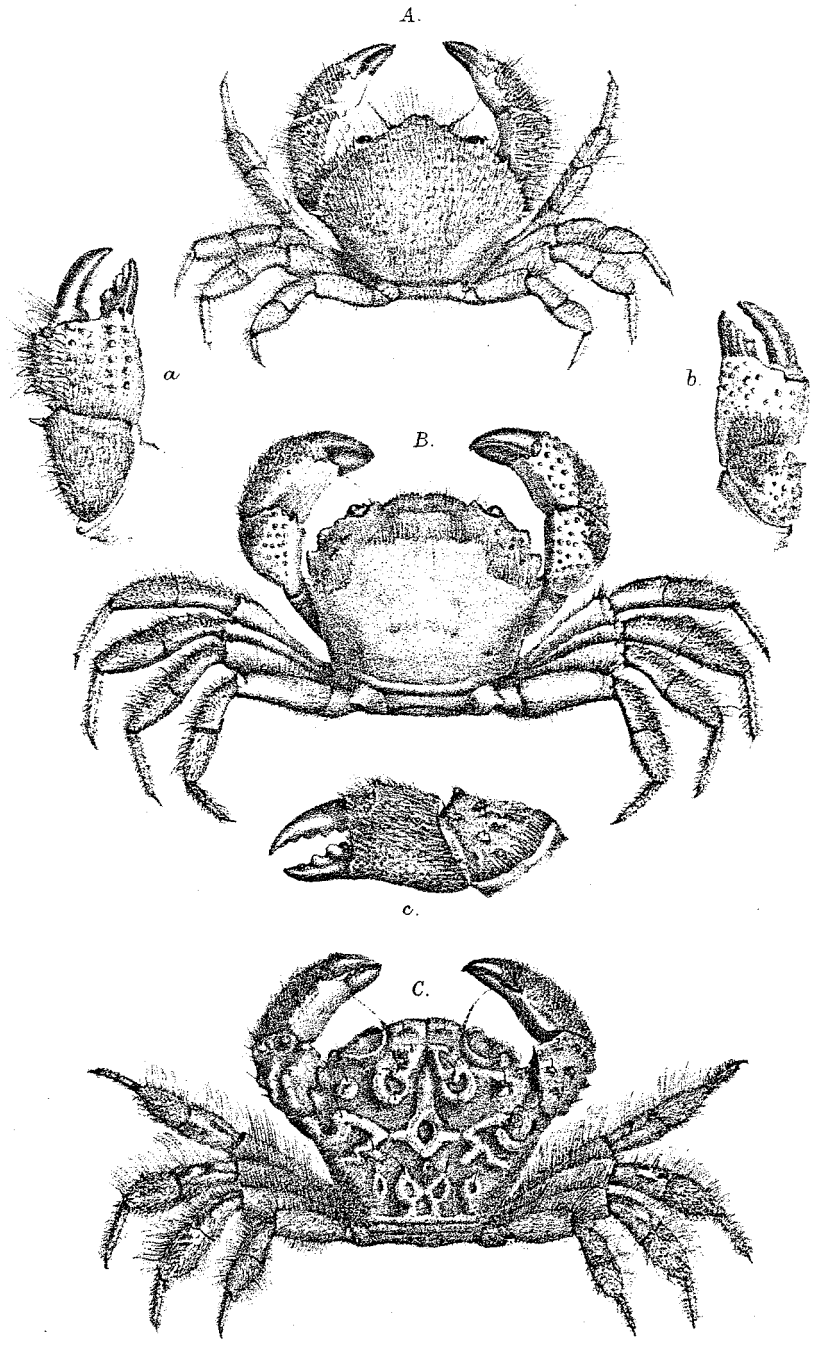
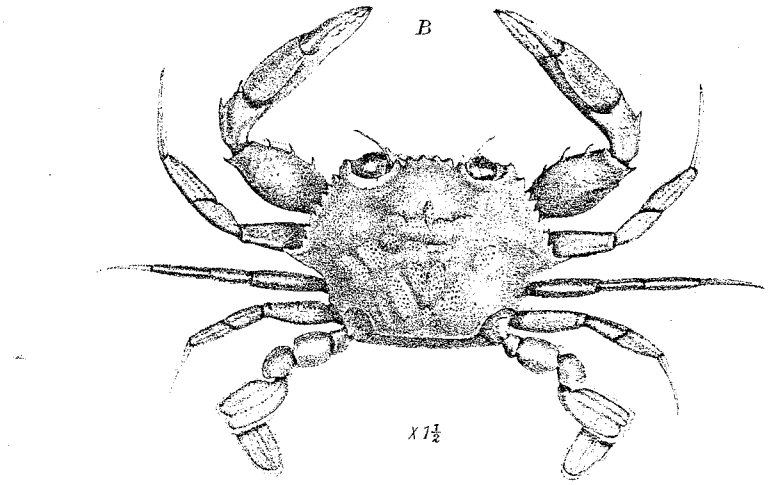
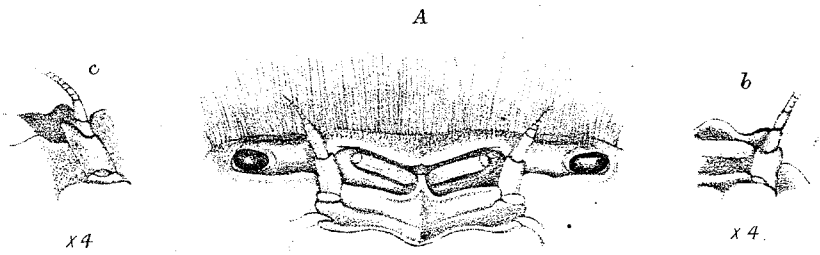
Fig. A. Chlorodopsis granulatus. Fig. B. Pilumnus lanatus.
Fig. C. Pilumnus seminudus.

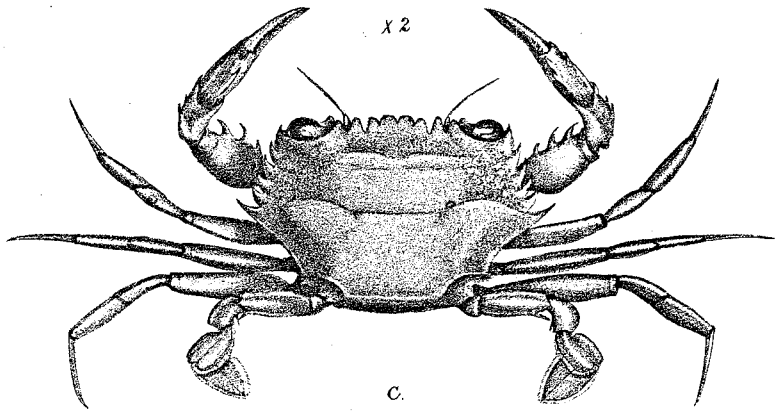


Robt. Morgan del et lith. Mintern Bros. imp

Fig. A. Pilumnus pulcher. *Fig. B. Pilumnus semilanatus.*
Fig. C. Pilumnus labyrinthicus.

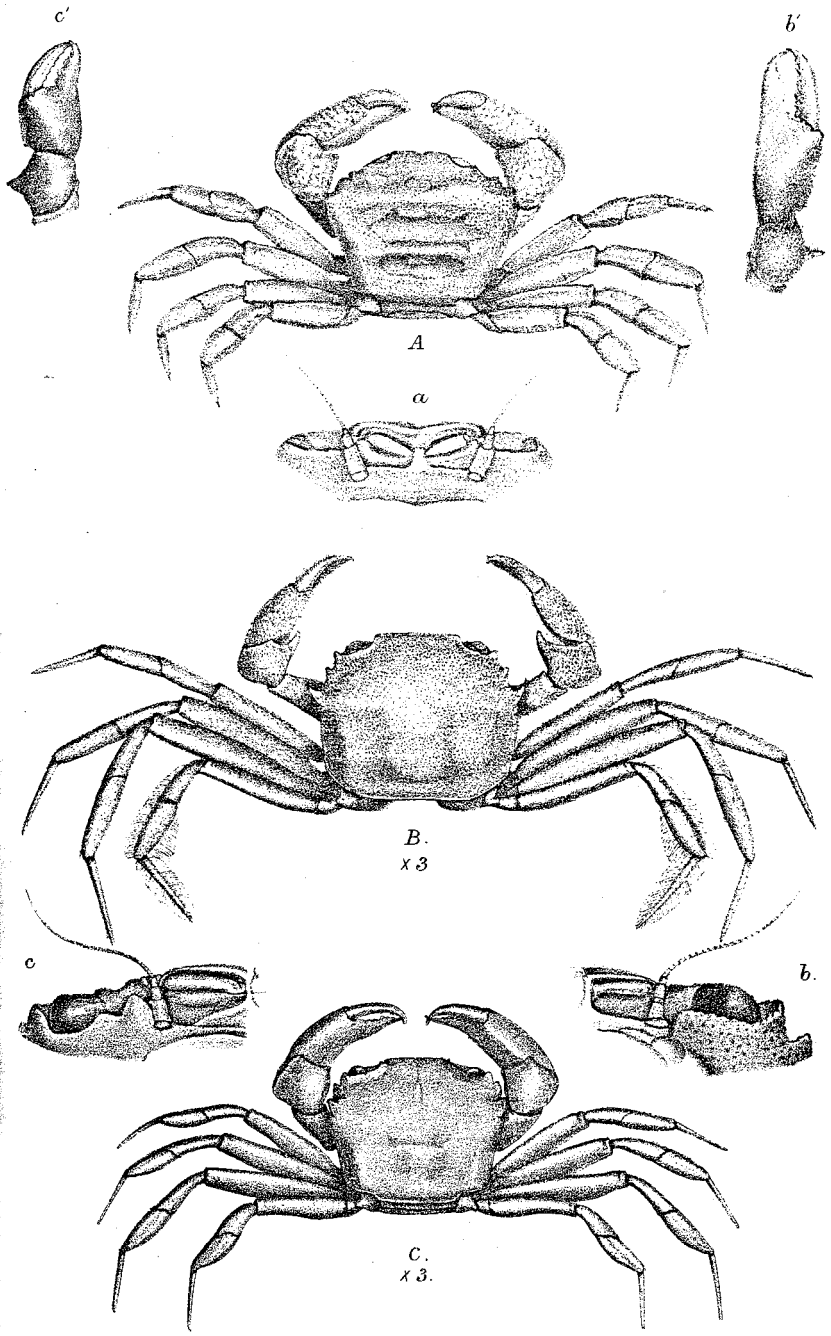






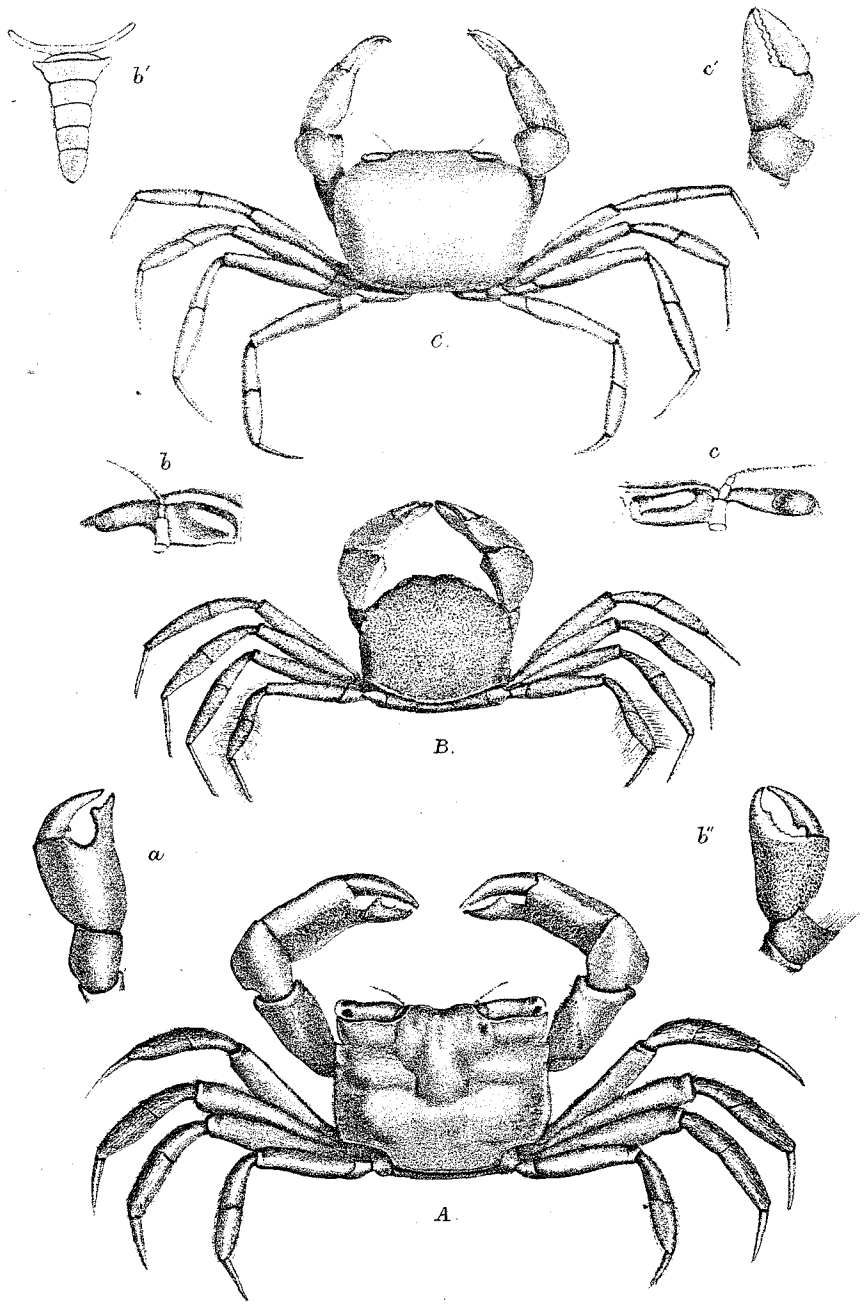
Robt. Morgan del et lith. Mittern Bros. imp.

Fig. A. Cryptocœloma fimbriatum. Fig. B. Achelous granulatus, var. unispinosus. Fig. C. Goniosoma spiniferum.



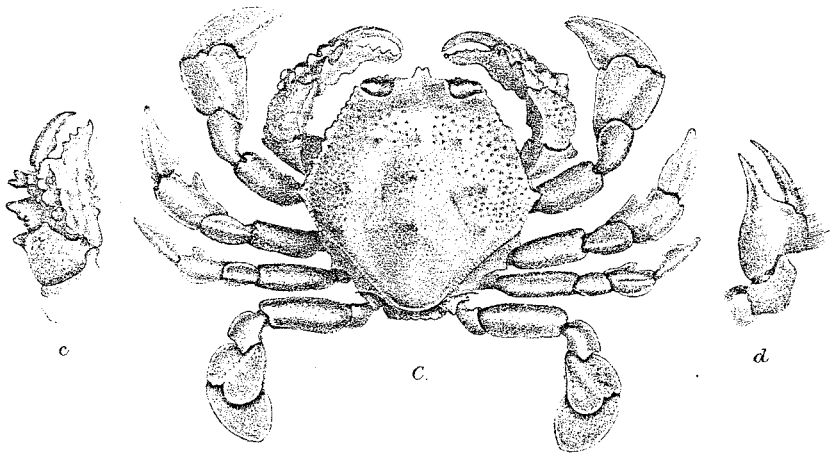
Robt. Morgan del et lith. Mintern Bros. imp.

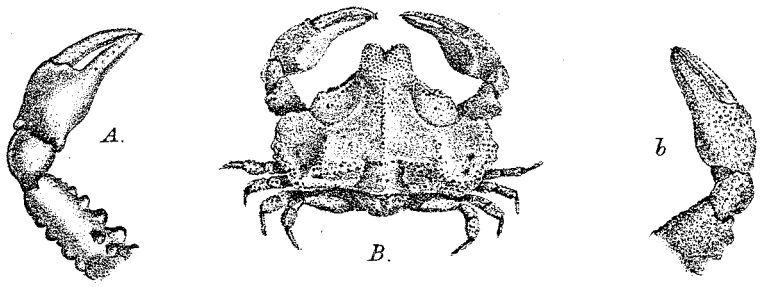
Fig. A. Camptoplax coppingeri. Fig. B. Pseudorhombila vestita, var: sexdentata.
Fig. C. Pseudorhombila sulcatifrons, var: australiensis.

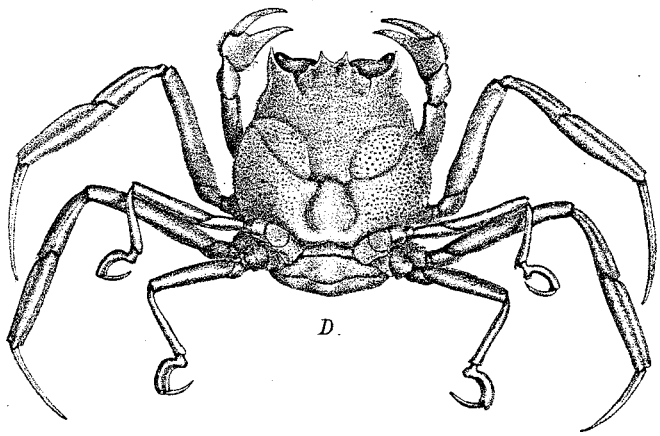


Robt. Morgan del et lith. Mintern Bros. imp.

Fig. A. Macrophthalmus punctulatus. Fig. B. Ceratoplax arcuata
Fig. C. Ceratoplax laevis.



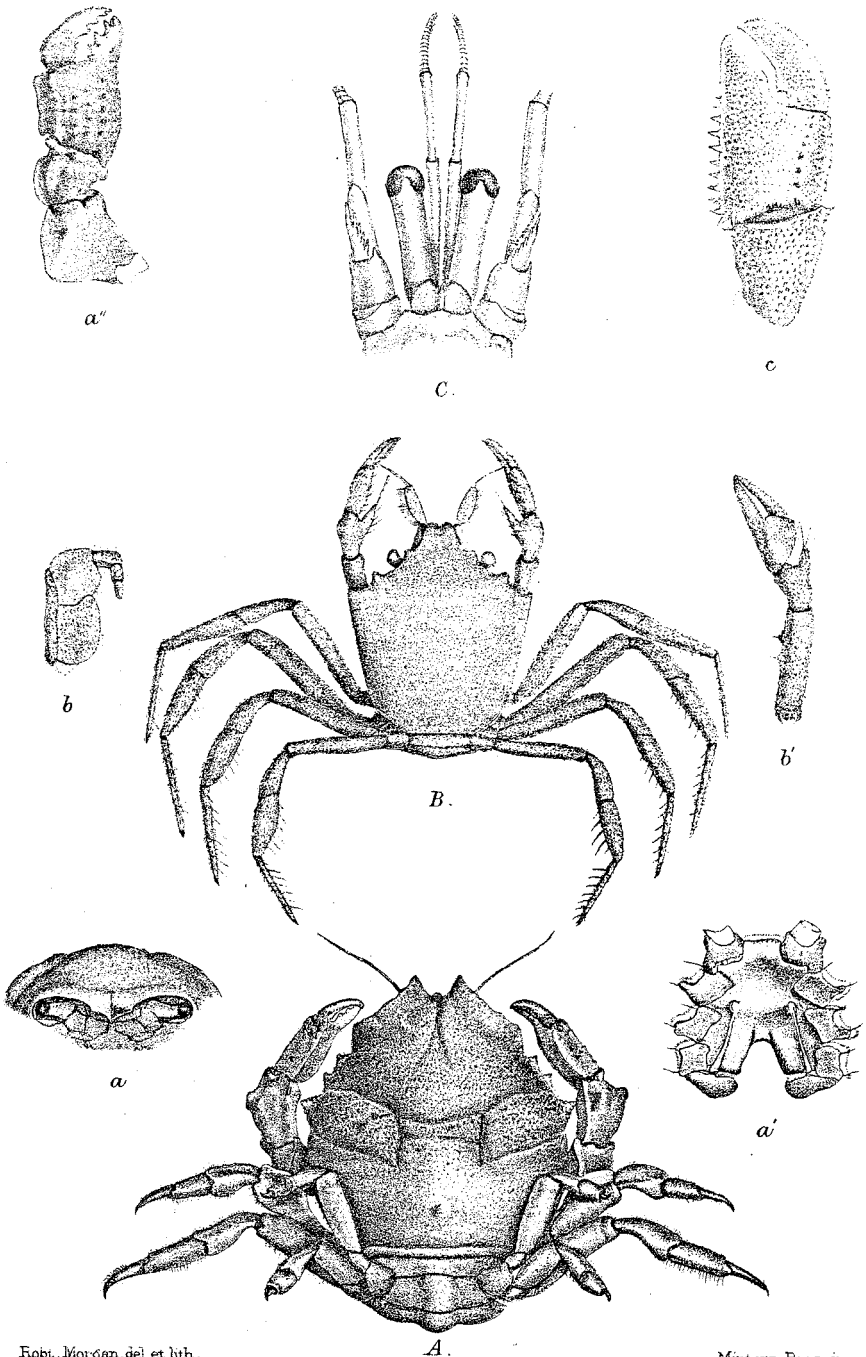




Robt. Morgan, del et lith.

Mintern Bros. imp.

Fig. A. Leucosia craniolaris, var. lævimanus. Fig. B. Oreophorus frontalis.
Fig. C. Matuta inermis. Fig. D. Dorippe



Robt. Morgan, del et lith. Mintern Bros. imp.

Fig. A. Petalomera pulchra. Fig. B. Paratymolus sexspinosus.
Fig. C. Diogenes rectimanus.

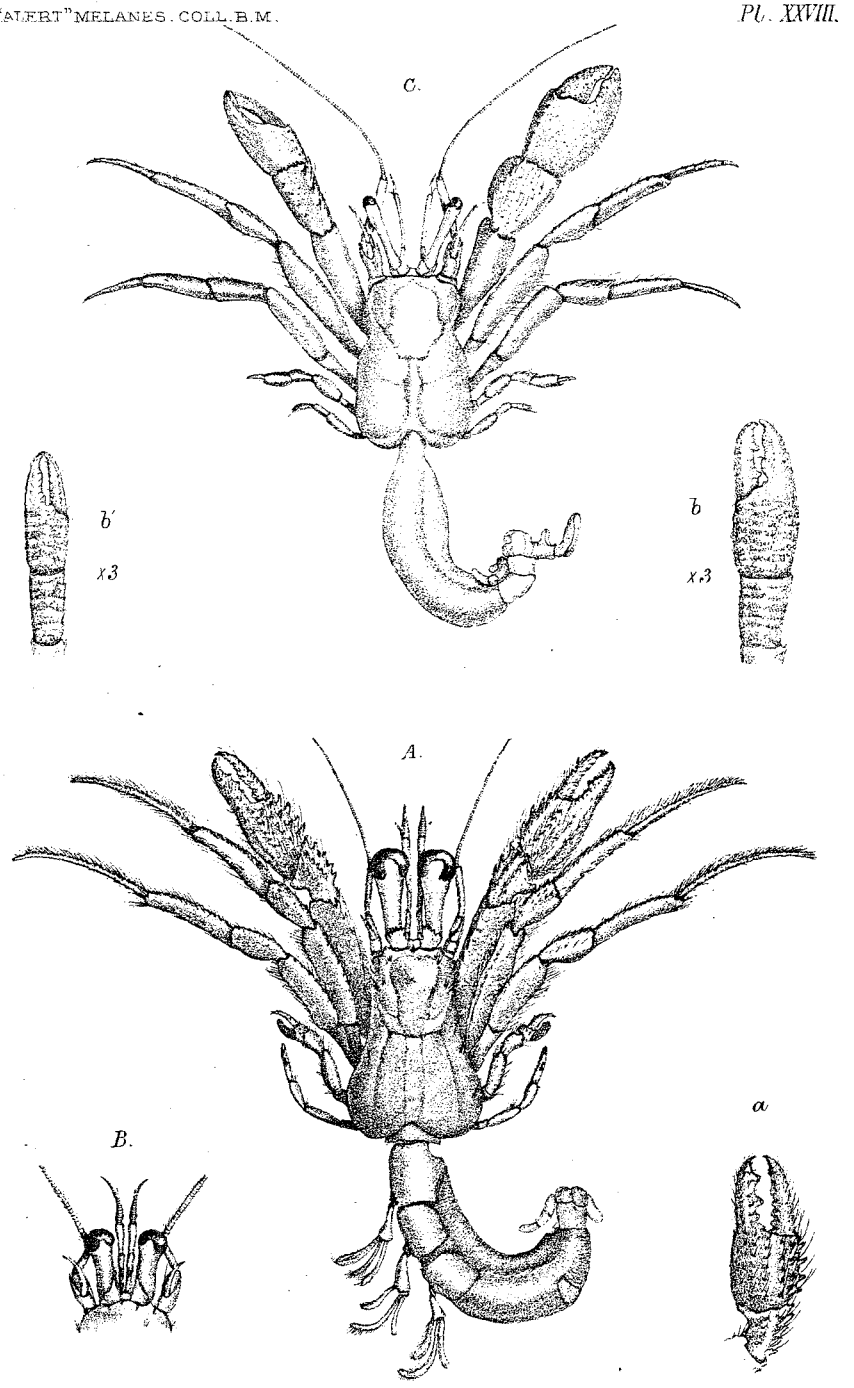


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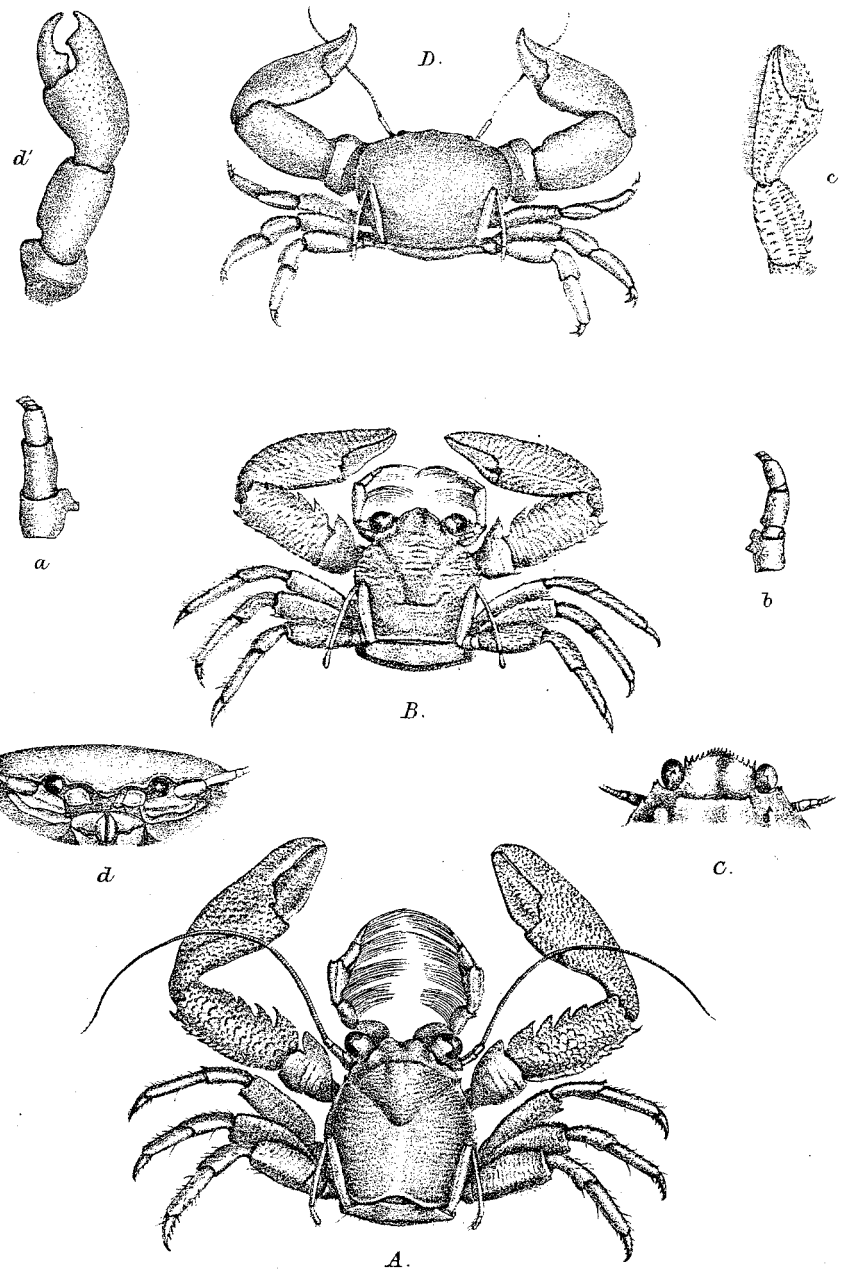
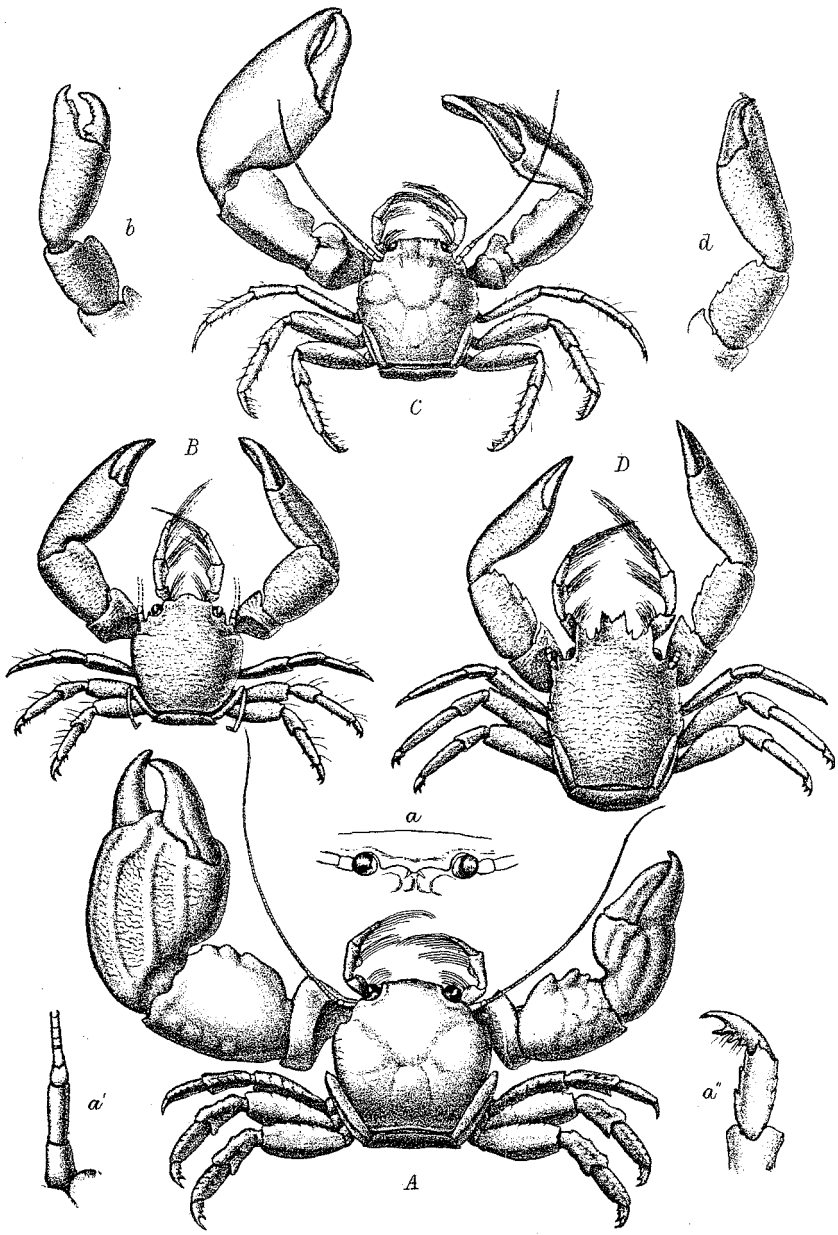
Fig. A. Pagurus hessii. Fig. B. Eupagurus compressipes.
Fig. C. Eupagurus kirkii.



Robt. Morgan, del et lith.

Mintern Bros imp

Fig. A. Petrolisthes haswelli. *Fig. B. Petrolisthes annulipes.*
Fig. C. Petrolisthes corallicola. *Fig. D. Polyonyx obesulus*



Berjeau & Highley del et lith. Mintern Bros. imp.

Fig. A. Pachycheles pulchellus. *Fig. B. Porcellana nitida, var: rotundifrons.*
Fig. C. Porcellana dispar. *Fig. D. Porcellana quadrilobata.*

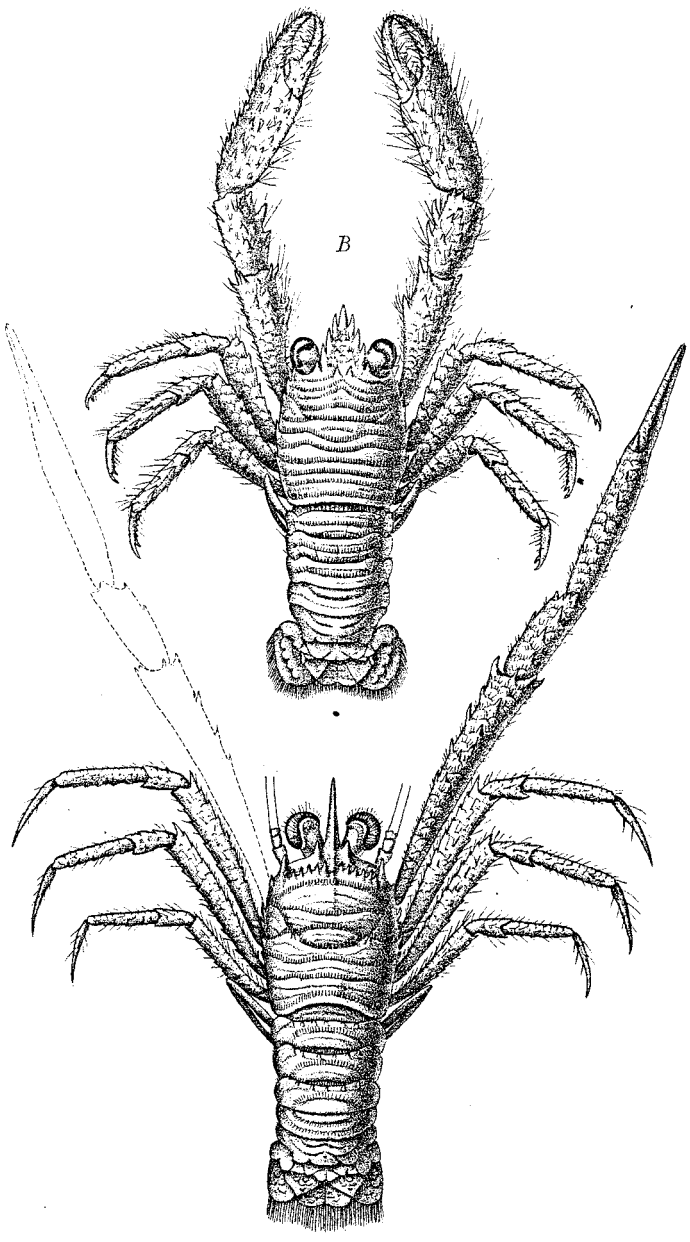


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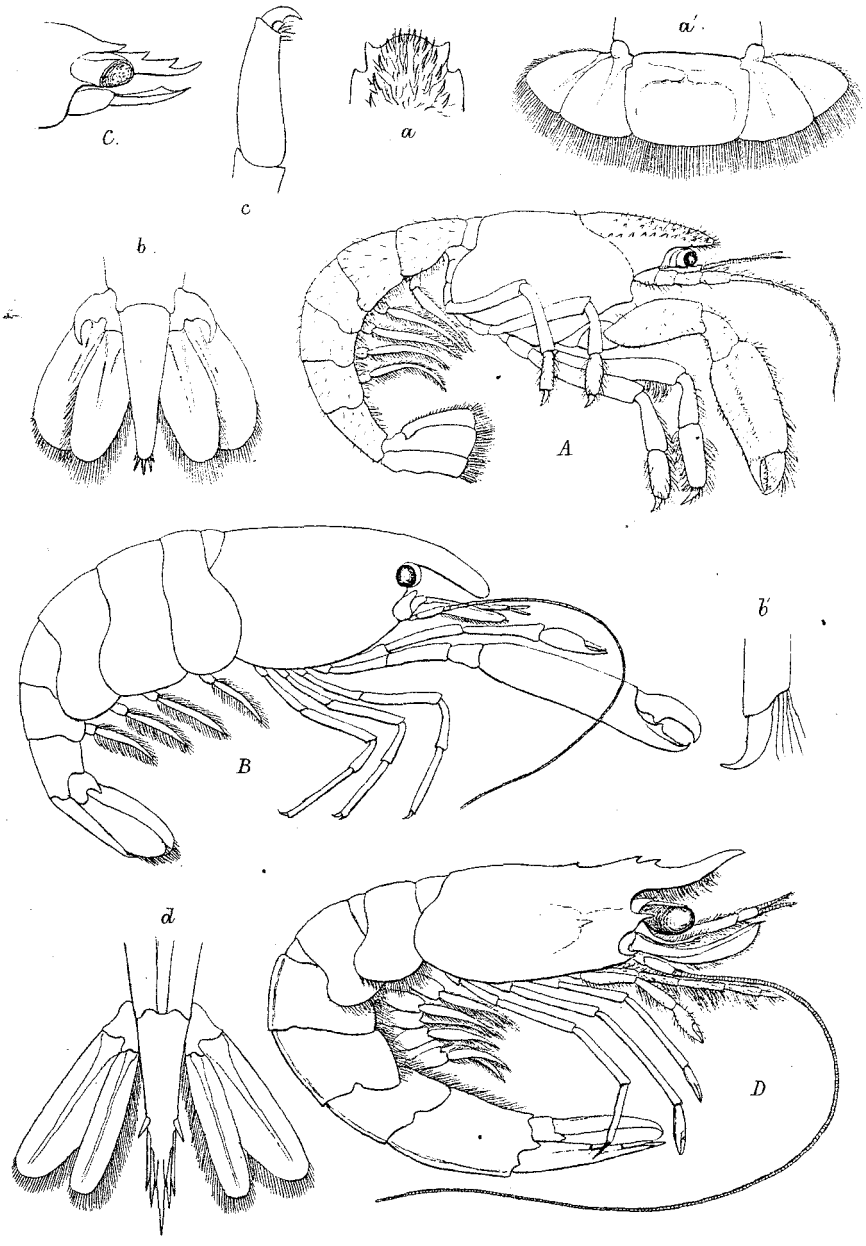
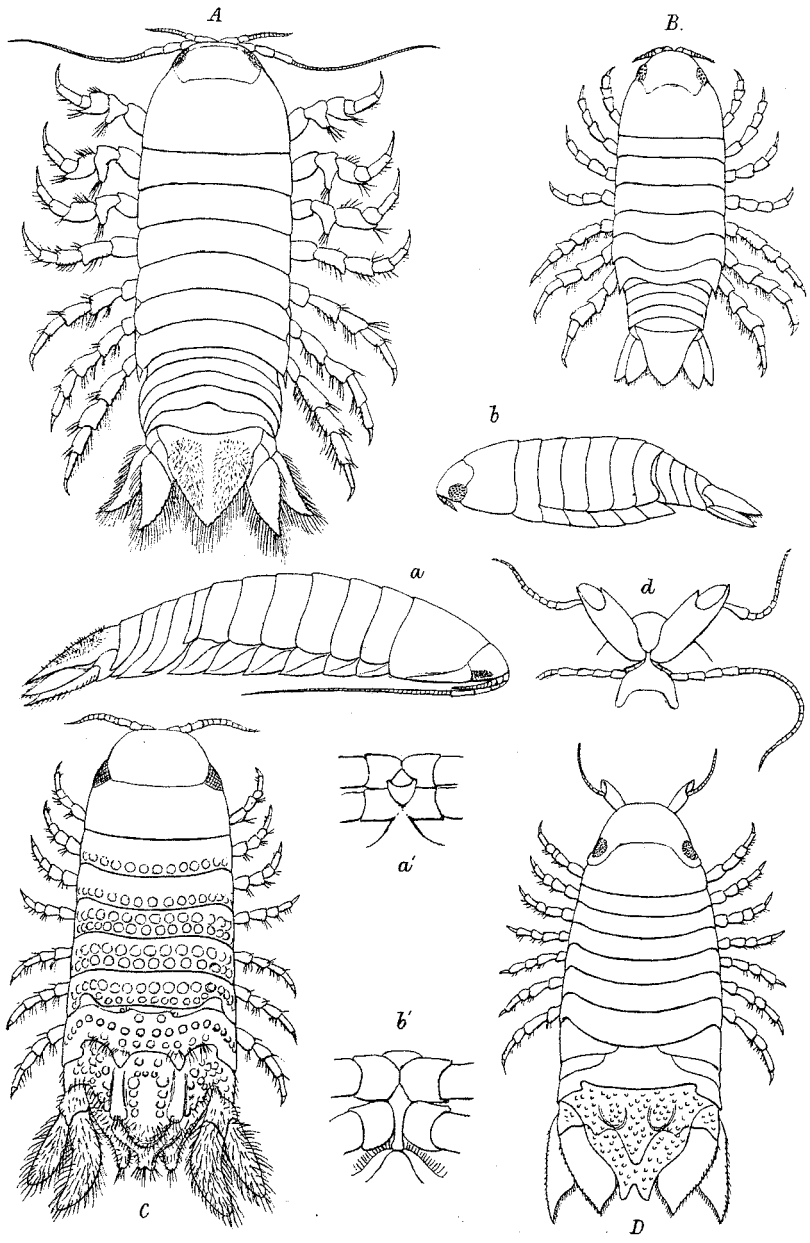
Fig. A. Galathea australiensis. *Fig. B. Munida spinulifera.*



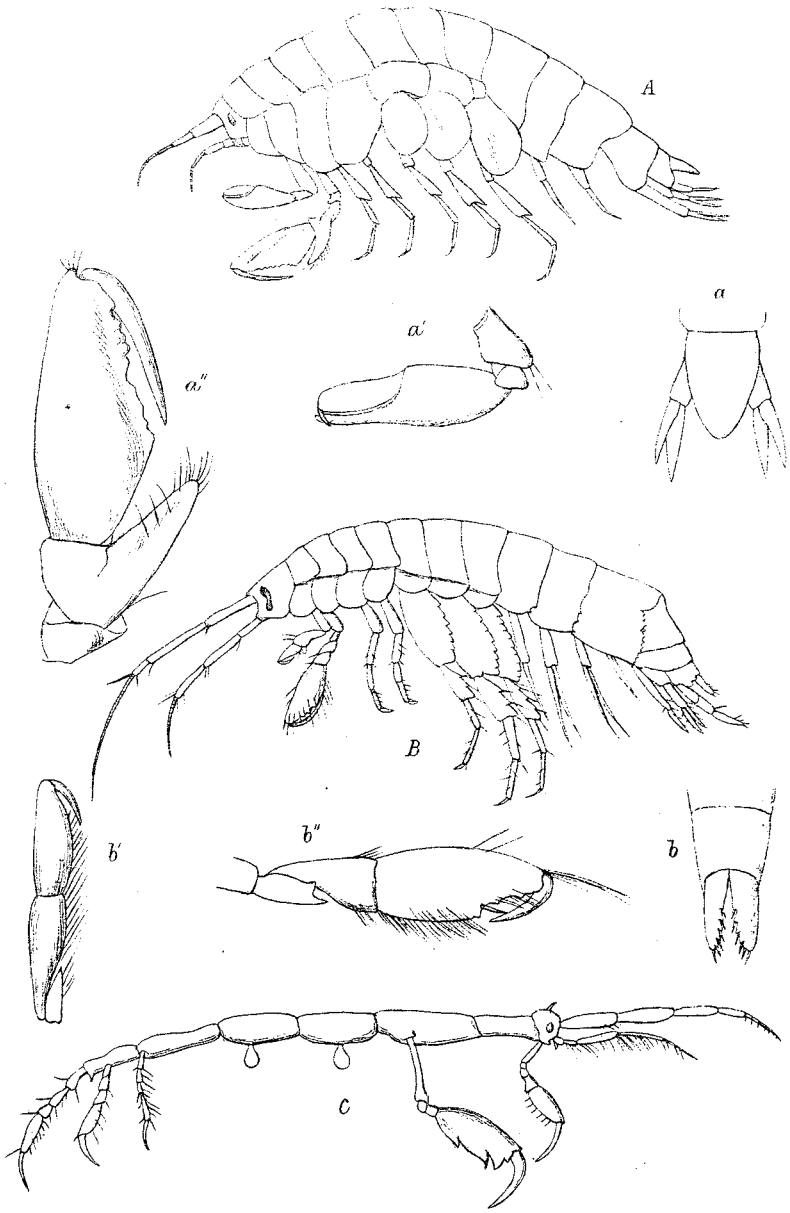
Berjeau & Highley del et lith. Mintern Bros. imp.

Fig. A. Gebiopsis darwinii. Fig. B. Harpilius inermis.
Fig. C. Coralliocaris tridentata. Fig. D. Penæus batei.



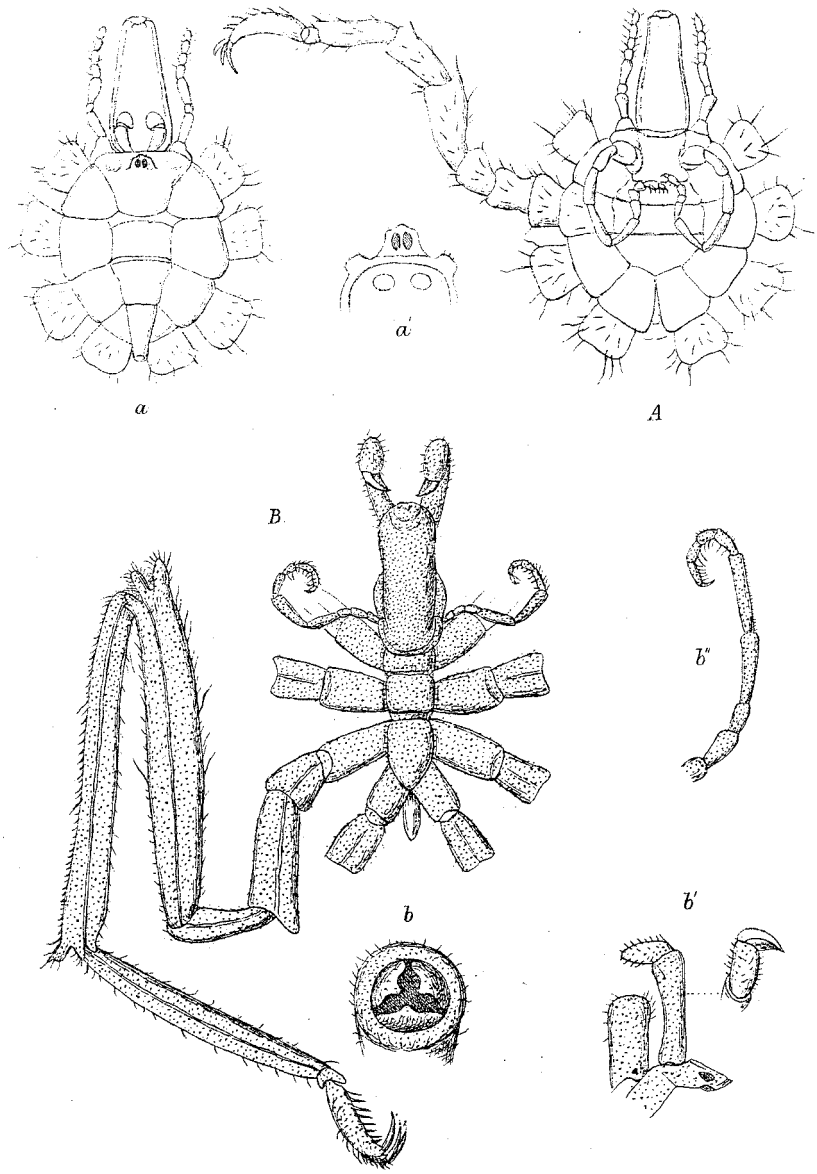
Berjeau & Highley del et lith. Mintern Bros. imp.

Fig. A. Cirolana schiödtei. Fig. B. Cirolana tenuistylis.
Fig. C. Cymodocea longistylis. Fig. D. Cerceis bidentata.



Mintern Bros. lith.

Fig. A. Leucothoë brevidigitata. *Fig. B. Megamœra thomsoni.*
Fig. C. Caprella attenuata.



Mintern Bros. lith.

Fig. A. Achelia lævis, var. australiensis.
Fig. B. Phoxichilidium hoekii.