

ANNALS  
OF THE  
SOUTH AFRICAN MUSEUM.

(VOL. XV.)



1.—*South African Crustacea* (Part VII. of S.A. Crustacea, for the Marine Investigations in South Africa).—By the Rev. THOMAS R. R. STEBBING, M.A., F.R.S., F.L.S., F.Z.S., Fellow of King's College, London, Hon. Memb. New Zealand Inst., Hon. Fellow Worcester College, Oxford.

(Plates I.—XII. of Vol. XV. Plates LXV.—LXXVI. of Crustacea.)

At various opportunities Dr. Gilchrist and Dr. Péringuey have sent me specimens of *Macrura* from South African waters. I was in hopes of being able to deal with the accumulated material in a single essay. But it now seems expedient to offer the present contribution as a first instalment of the report. There is some excuse for going slowly. The literature of the subject has become voluminous, and not infrequently the student is confronted with two opposite difficulties, in having to guess what species was intended by an old meagre description, and in having to weigh critically all the minute distinctions of a modern elaborate one. When there are many specimens at his disposal all superficially alike, he has to guard against overlooking important characters that may differentiate some of them. When the specimen is unique, there is the torturing alternative of spoiling it for exhibition in a museum by dissection, or spoiling it for any real use to science by leaving it intact. With the extension of research the task of assigning specific names becomes increasingly hard, as connecting links are discovered between species and species, and the range of variability within an acknowledged species is demonstrated. Of the South African macruran fauna it is probably true that its members have very near relatives in almost every part of the ocean.

Six new species are here proposed, and two new genera, *Hali-poroides* and *Macropetasma*. Further, the name *Pomatochelidae* is substituted for the family previously called *Pylochelidae*, and for the preoccupied names *Sicyonia* and *Ogyris* the new generic names

*Eusicyonia* and *Ogyrides* are offered respectively in exchange. Incidentally a parasitic isopod is named *Hemiarthrus nematocarcini* and the amphipod *Platyischnopus mirabilis* is added to the South African fauna.

## MACRURA.

### MACRURA ANOMALA.

#### TRIBE PAGURIDEA.

1888. *Paguridea*, Henderson, Rep. Voy. Challenger, vol. 27, p. 40.

#### FAMILY POMATOCHELIDAE.

1888. *Pylochelidae*, Bate, Rep. Voy. Challenger, vol. 24, pp. 10, 11.  
 1892. *Parapaguridae*, Ortmann, Zool. Jahrb., vol. 6, pp. 243, 274.  
 1893. „ Stebbing, Hist. Crust., Internat. Sci. Ser., vol. 74, pp. 166, 169.  
 1901. *Pylochelidae*, Alcock, Catal. Indian Deep-sea Crust. Anomala, p. 209 (*Pomatochelidae* ?, p. 210).  
 1905. „ Alcock, Catal. Indian Deep-sea Anomura, fasc. 1, pp. 12, 13.  
 1913. „ Balss, Abhandl. K. Bayer. Ak. Wiss., Suppl. vol. 2, pt. 9, p. 34.

The genera included in this family, according to Alcock, are *Pomatocheles*, Miers, 1879, *Pylocheles*, A. Milne-Edwards, 1880, *Mixtopagurus*, A. Milne-Edwards, 1880, *Cheiroplatea*, Bate, 1888, and *Parapylocheles*, Alcock, 1901. The proximity of *Pomatocheles* to *Pylocheles* was noticed by A. Milne-Edwards and Bouvier in 1893, and in 1913 the species *Pomatocheles jeffreysii*, Miers, is transferred by Balss to *Mixtopagurus*. But clearly the generic name given by Miers has the precedence, and the union of the two genera requires that the *Mixtopagurus paradoxus* of A. Milne-Edwards and Henderson's *Pylocheles spinosus* should be renamed as species of *Pomatocheles*. There is a difficulty in regard to *Mixtopagurus gilli*, Benedict, 1901, that it has a very unsymmetrical telson, which would seem to exclude it from this family altogether. That the family should be named *Pomatochelidae* after its premier genus, as Alcock suggested in 1901, is to my mind obvious, but *quot homines, tot sententiae*.

## GEN. POMATOCHÉLES, Miers.

1879. *Pomatocheles*, Miers, Pr. Zool. Soc. London, p. 49.  
 1880. *Mixtopagurus*, A. Milne-Edwards, Bull. Mus. Comp. Zoöl.,  
 vol. 8, pt. 8, p. 39.  
 1893. „ A. M.-Edwards and Bouvier, Mem. Mus. Comp.  
 Zoöl., vol. 14, No. 3, p. 23.  
 1905. *Pomatocheles* and *Mixtopagurus*, Alcock, Catal. Indian Deep-  
 sea Anomura, fasc. 1, p. 14.  
 1913. *Mixtopagurus*, Balss, Abhandl. K. Bayer. Ak. Wiss., Suppl.  
 vol. 2, pt. 9, p. 34.

In his synopsis of the genera, Alcock distinguishes *Pomatocheles* as having "hands of chelipeds forming an operculum" from *Mixtopagurus* with "chelipeds not operculiform." Both are distinguished from *Pylocheles* and *Cheiroplatea* by having the third maxillipeds normal instead of cheliform. The new species here described is distinguished from *P. gilli* by its symmetrical telson, from *P. paradoxus* by having the palp of the first maxillae simple instead of two-jointed, from *P. spinosus* by its unequal chelipeds, and from *P. jeffreysii* by longer eyestalks, the rostrum acute instead of rounded, unequal and strongly tuberculose chelipeds, and the much more sharply separated lobes of the telson.

## POMATOCHÉLES BALSSI, n. sp.

## Plate LXXV.

The anterior half of the carapace is calcified, the rest more or less membranaceous, as is the case with the pleon except in the short first segment and the sixth, the latter appearing to be immovably bent, as though the telson and uropods were permanently folded forwards and underneath. It is rather remarkable that this symmetrical hermit should have been found occupying a simple cylindrical coral which is itself curved and tapers to a narrow completely closed foot. But similarly *P. jeffreysii* occupied the curved shell of a *Dentalium*. The general surface is pilose, the rostral point acute, a smaller acute point being formed by the front margin outside each ocular peduncle. These peduncles are long, a little dilated for the small dark cornea; the small scales at the base are not contiguous and are produced on the inner side into a single acute point. The telson is much longer than broad, bilobed with a deep apical incision, the sides of which, like the free border all round, are fringed with plumose setae; the

outer lateral margins are convex, with no such concavity as is shown in the figures of *P. jeffreysii* and *P. spinosus*. In *P. paradoxus* the sides of the telson are sinuous in the figure, but in the description the telson is said to be "broadly emarginate behind and excavate on the sides."

The first antennae have a first joint rather longer than the second, with an apical tooth on one side and one below the apex on the other; the third joint is rather shorter than the second; the principal flagellum is subequal in length to the peduncle, its first half broad, with very long plumose setae, the whole nearly twice as long as the slender companion flagellum. The peduncles are perhaps scarcely as long as the eyes. Benedict, in comparing *P. gilli* with *P. paradoxus*, remarks that in the latter species these peduncles do not reach the corneae, while in the former they pass them. But it may be asked whether he is not comparing the peduncles of his own species fully extended with those of Milne-Edwards' figured in their natural geniculate position, which shows the second joint end on, thus giving no idea of its actual length.

The long third joint of the mandibular palp is partially fringed with setules. The middle plate of the first maxillae is fringed with numerous strong spines, the narrow one-jointed "palp" has six slender spines at the apex. The long sinuous apical joint of the second maxillae, broad at its base, is drawn out to a fine point at the lightly armed apex. In the third maxillipeds the third joint is armed with a long row of teeth, the fourth joint has two teeth at the outer apex, the sixth joint is elongate, carrying the short spinose seventh at its end, with no suggestion of the chelate character which makes these appendages notable in *Pylocheles*.

The first peraeopods are not symmetrical, that on the left side being considerably the larger. In both, the fourth, fifth, and sixth joints are furnished with numerous teeth, the fingers of the left chela being stout, shorter than the palm, while those on the right are subequal to it in length. The small but sturdy fifth peraeopods have the sixth joint fringed with close-set spines, the short finger closing tightly on the truncate or slightly concave apex.

The first pleopods of the male are set rather near together, membranaceous, fringed with setae, in shape like a flat spoon, the handle curved, of uniform width, the bowl pointed. The second pair wide apart, with stiff peduncle, the single ramus ending in a membranaceous trowel-shaped expansion. The three remaining pairs all membranaceous, each with a long and a short ramus. Peduncle of the uropods with a small tooth at each apex, both rami fringed

with long plumose setae and pads of short stout spines along the outer margin.

Total length, allowing for an extended telson, about 18 mm., the carapace accounting for 6 mm. The eyes are 3 mm. long. The coral is 33 mm. long, width of interior at the top nearly 7 mm. externally 10 mm., narrowest part 6 mm.

*Locality.* Near East London, Cove Rock NW.  $\frac{3}{4}$  W. 13 miles (Cape Colony); depth 80–130 fathoms. A 1571.\*

The specific name is given in compliment to Dr. Heinrich Balss, a valued carcinologist.

### TRIBE GALATHEIDEA.

1888. *Galatheidea*, Henderson, Rep. Voy. Challenger, vol. 27, p. 103.

### FAMILY GALATHEIDAE.

1853. *Galatheidæ*, Dana, U.S. Expl. Exp., vol. 13, p. 1431.

### GEN. GALATHEA, Fabricius.

1793. *Galathea*, Fabricius, Entomologia Sytematica, vol. 2, p. 472.

### GALATHEA DISPERSUS, Bate.

1858. *Galathea dispersa*, Bate, Journ. Pr. Linn. Soc. London, vol. 3, No. 9, p. 3.
1863. *G. nexa*, Heller (not Embleton), Crust. südl. Europa, p. 191, pl. 6, fig. 4 (by misprint 3 in expl. pl.).
1888. *G. dispersa*, Henderson, Rep. Voy. Challenger, vol. 27, pt. 69, p. 119, pl. 12, figs. 6, 6a.
1888. „ Bonnier, Bull. Sci. France Belgique, Ser. 3, vol. 1, Nos. 4–8, p. 68, pl. 13, figs. 1–3.
1900. „ A. Milne-Edwards et Bouvier, Crust. Decap., Travailleur et Talisman, p. 278, pl. 29, figs. 2, 3.
1910. „ Stebbing, Ann. S. Afr. Mus., vol. 6, pt. 4, p. 364.

The fuller description of Stimpson's *Galathea labidoleptus*, published in 1907, long after Stimpson's death, appears to show

\* The number given with a locality only concerns the South African Museum.

many points of difference from *G. dispersus*. Thus he describes the rostrum as long, with the four lateral teeth as small and very slender, the gastric region of the carapace carrying 2 little spines anteriorly, the chelipeds as rather stout, hand with a thick palm, but very slender fingers, which together are much narrower than the palm, straight and not toothed.

In the specimens here referred to *G. dispersus* the rostrum cannot properly be called long, and three of the lateral teeth are not small nor always slender, the teeth behind the rostrum on the gastric region are 6 in number. Within and slightly below the antero-lateral tooth there is a small denticle, and a row of denticles runs behind the antero-lateral to a pterygostomial tooth; a line of seven teeth runs down each side. The first joint of the first antennae has three long apical processes. The fingers of the chelipeds are together not strikingly narrower than the palm, and they are not devoid of teeth on their confronting margins, though the teeth are inconspicuous except one near each curved apex. Perhaps the most distinctive feature of this species is one to which Stimpson's account makes no allusion, namely, the four conspicuous teeth on the oblique distal margin of the fourth joint in the third maxillipeds. The difficulty of deciding anything as to the independence of Stimpson's species is in large measure due to the varying characters of *G. dispersus*. Thus Henderson states that "the first striated ridge on the gastric area, situated at the base of the rostrum, bears from two to six spinules, but in some cases they are obsolete." A. Milne-Edwards and Bouvier have discussed the great differences in size that occur between adult specimens. In our three South African specimens, of graduated sizes, the medium one was 23 mm. long, of which the carapace accounted for 12.5 mm., the rostral part of it being 4.5 mm., and the greatest breadth 8 mm. Only in the smallest of the three did the rostral lateral teeth give the impression of slenderness.

*Locality.* Great Fish Point Lighthouse, W. by N. 5 miles (Cape Colony); depth 22 fathoms. A 919.

#### GEN. MUNIDOPSIS, Whiteaves.

1874. *Munidopsis*, Whiteaves, Amer. J. Sci., Ser. 3, vol. 7, p. 212.  
 1882.        ,,        S. I. Smith, Bull. Mus. Comp. Zoöl., vol. 10,  
   No. 1, p. 21.

1888. *Munidopsis*, Henderson, Rep. Voy. Challenger, vol. 27, pt. 69, p. 148.
1895. „ Faxon, Mem. Mus. Comp. Zoöl., vol. 18, p. 81.
1900. „ A. Milne-Edwards et Bouvier, Exp. Travailleur et Talisman, Crust. Decap., pt. 1, p. 312.
1901. „ Alcock, Catal. Indian Deep-sea Crustacea, p. 247.
1902. „ Benedict, Pr. U.S. Mus., vol. 26, pp. 244, 315.
1904. „ Calman, Ann. Nat. Hist., Ser. 7, vol. 14, p. 214.

Alcock's synonymy of this genus includes *Galathodes*, *Orophorhynchus*, *Elasmonotus*, instituted by A. Milne-Edwards in 1880, *Anoplomotus*, Smith, 1883, *Galathopsis*, Henderson, 1885, and *Bathyankyristes*, Alcock and Anderson, 1894, the intergrading of all but the last having been already discussed by Faxon in 1895. But, while making the name *Munidopsis* generically paramount, Alcock divides the genus into five groups under the names *Munidopsis*, *Galathodes*, *Orophorhynchus*, *Elasmonotus*, *Bathyankyristes*, so that the last four generic names seem to be practically readmitted as it were by the back door, after being turned out by the front one. Group 1 is defined as:—

“*Munidopsis* proper, with the antero-lateral angles of the carapace spiniform, even if the lateral borders are not anteriorly spinose or dentate; with the rostrum styliform or acutely triangular, without any lateral spines; with the chelipeds decidedly longer than the legs and usually, in the male, as long as, or longer than, the fully extended body; and with the eyes terminal on the eye-stalks, which are almost always freely movable.”

#### MUNIDOPSIS SIMPLEX, A. Milne-Edwards,

1880. *Galathodes simplex*, A. Milne-Edwards, Bull. Mus. Comp. Zoöl., vol. 8, p. 56.
1894. *Munidopsis simplex*, A. M.-Edwards et Bouvier, Ann. Sci. Nat., Ser. 7, vol. 18, p. 275.
1897. „ „ A. M.-Edwards et Bouvier, Mem. Mus. Comp. Zoöl., vol. 19, No. 2, p. 89, pl. 5, figs. 2-7.
1900. „ „ A. M.-Edwards et Bouvier, Exp. Travailleur et Talisman, Crust. Decap., p. 314.

1902. *Munidopsis simplex*, Benedict, Pr. U.S. Mus., vol. 26, pp. 277, 326.  
 1908. „ „ Hansen, Danish Ingolf Exp., vol. 3, Crust. Malac., p. 37.

In Benedict's useful key to fifty-one species of the genus, *M. simplex* is distinguished as one of those in which eye spines are not present, the rostrum is simple and curved upward, the armature of the pleon confined to the median line, the median line on the gastric area armed with spines or tubercles, orbicular (? orbital) sinus lacking, and finally with carapace of nearly uniform width, widest in middle, not cut up into lobes. *M. longirostris*, A. M.-Edwards and Bouvier, agrees with it, according to the key, except in having "carapace not uniform in width, cut into lobes by cervical sutures" and "broadest near anterior end." Our specimens have the carapace narrowest near anterior end, with antero-lateral spines less pronounced than those figured for *M. longirostris*. On the other hand, the third maxillipeds have only two teeth on the inner margin of the fourth joint, which the French authors mention as a character of their species, compared with the three teeth in *M. simplex*. Here also the carapace has a transverse pair of teeth followed by a single tooth near them and another quite distinct at a distance, in accord with *M. longirostris*. Thus, as the French authors themselves suggest, the two forms are probably not specifically distinct. The carapace including rostrum of the larger specimen measures 22 mm. in length, the pleon being rather shorter; it contained eggs in no great quantity. The carapace of a much smaller specimen measured 18 mm., of which the rostrum accounted for 7.5 mm.

*Locality.* Cape Point, N. 77° E. (Cape Colony); depth 660 fathoms. A 912.

## MACRURA GENUINA.

### TRIBE THALASSINIDEA.

1893. *Thalassinidea* (part), Stebbing, History of Crustacea, Internat. Sci. Ser., vol. 74, p. 180.  
 1901. „ Alcock, Catal. Indian Deep-sea Macrura, p. 151.  
 1903. „ Borradaile, Ann. Nat. Hist., Ser. 7, vol. 12, p. 534.



## FAMILY AXIIDAE.

1888. *Axiidae*, Bate, Rep. Voy. Challenger, vol. 24, p. 36.  
 1901. ,, Alcock, Catal. Indian Deep-sea Macrura, p. 186.  
 1901. ,, Rathbun, Bull. U.S. Fish. Comm. 1900, vol. 2, p. 95.  
 1906. ,, Rathbun, Bull. U.S. Fish. Comm. 1903, pt. 3, p. 893.  
 1907. ,, Borradaile, Ann. Nat. Hist., Ser. 7, vol. 19, pp. 468,  
 475, 476.  
 1914. ,, Balss, Abhandl. K. Bayer. Ak. Wiss., Suppl. vol. 2,  
 pt. 10, p. 85.

## GEN. CALOCARIS, Bell.

1853. *Calocaris*, Bell, Brit. Stalk-eyed Crust., p. 231 (dated 1847 by  
 White in List of British Crustacea in Brit. Mus.,  
 p. 33, 1850).  
 1891. ,, Ortmann, Zool. Jahrb., vol. 6, p. 50, pl. 1, fig. 5,  
 (mouth organs).  
 1901. ,, Alcock, Catal. Indian Deep-sea Macrura, p. 187  
 (with synonymy, p. 189).  
 1908. ,, Lagerberg, Göteborgs K. Vet. Handl., Ser. 4, vol.  
 11, p. 51.  
 1908. ,, Hansen, Danish Ingolf Exp., vol. 3, Crust. Malac.  
 p. 41 (distribution).

## CALOCARIS BARNARDI, n. sp.

## Plate LXVI.

From Bell's *C. macandreae* the present species is well distinguished by the very different proportions of the large chelae in the first pereopods, the fingers in the former being about three times as long as the palm, while here the fixed finger is not longer than the palm and the movable finger about once and a half as long as that shorter part of the palm to which it is attached. In *C. alcocki*, McArdle, the palm is as long as the fingers, but the whole structure is more slender than in the new species. There also the rostrum is upturned, whereas here it is perfectly straight and horizontal; the carinae diverging backwards from the rostrum are each surmounted by three denticles. The telson has a minute median spine in its very shallow apical emargination.

The eyes are large, flattened, and as preserved opaque white.

In the first antennae the proximal portion of the first joint is much wider than the distal; of the two slender flagella one is rather more than thrice, the other more than four times as long as the peduncle. In the second antennae the penultimate joint of the peduncle is twice as long as the last joint, but only a little longer than the ante-penultimate joint; the flagellum is about twice as long as the longer one in the first pair.

In the palp of the mandibles the third joint is the longest. The long two-jointed palp of the first maxillae has the first joint straight, the second sinuous. The third maxillipeds have an apical tooth on the first joint and also on the second, the remaining joints are beset with numbers of very long spine-like setae; the third joint has a slightly oblique surface row of 8 or 9 teeth, and the following joint has a small sub-terminal tooth as in *C. alcocki*; the seventh joint has a close brush of serrate spines in addition to its long setae.

The fixed finger of the first peraeopods has its inner margin crenulate, met before the centre by a prominence of the movable finger. The confronting margins of both fingers in the second peraeopods are finely denticulate.

The first pleopods resemble the petasmata of the Penaeids, but are described and figured by Alcock as common to both sexes. The remarkable second pleopod of the female found in *C. alcocki* is not represented in our specimens. They attain a length of 38 mm.

*Locality.* Cape Castle, E.  $\frac{1}{2}$  N. 9 miles (near Saldanha Bay, Cape Colony); depth 89 fathoms. A 1549.

The specific name is given to mark my sense of the excellent service which Mr. K. H. Barnard is rendering to carcinology at the South African Museum under the auspices of Dr. Péringuey.

### TRIBE ERYONIDEA.

1901. *Eryonidea*, Alcock, Catal. Indian Deep-sea Macrura, p. 151.  
 1910. ,, Stebbing, Ann. S. African Mus., vol. 6, p. 377.

### FAMILY ERYONIDAE.

1852. *Eryonidae*, Dana, U.S. Expl. Exp., vol. 13, p. 515.  
 1901. ,, Alcock, Catal. Indian Deep-sea Macrura, p. 164  
 (with synonymy).

## GEN. PENTACHELES, Bate.

1878. *Pentacheles*, Bate, Ann. Nat. Hist., Ser. 5, vol. 2, p. 276.  
 1888. ,, Bate, Rep. Voy. Challenger, vol. 24, p. 143.  
 1901. ,, Alcock, Catal. Indian Deep-sea Macrura,  
 pp. 165, 171.

## PENTACHELES GRANULATUS (Faxon).

1893. *Polycheles granulatus*, Faxon, Bull. Mus. Comp. Zoöl., vol. 24,  
 p. 197.  
 1894. *Pentacheles beaumontii*, Alcock, Ann. Nat. Hist., Ser. 6, vol. 13,  
 p. 236, and Illustrations Zool. Investigator, Crust., pt. 2,  
 pl. 8, fig. 3.  
 1895. *Polycheles granulatus*, Faxon, Mem. Mus. Comp. Zoöl., vol. 18,  
 p. 123, pl. 32, fig. 1, pl. 33, figs. 2, 2a.  
 1901. *Pentacheles beaumontii*, Alcock, Catal. Indian Deep-sea  
 Macrura, p. 175.  
 1906. *Polycheles granulatus*, Rathbun, Bull. U.S. Fish. Comm., 1893,  
 p. 899, fig. 54.

Both specimens in the collection are small, only reaching a length of 38 or 39 mm. Unfortunately in both the first peraeopods are damaged, but the other details are well within the limits of variation shown by the descriptions which Faxon and Alcock have respectively given. The specimen more particularly examined has the small fifth peraeopod not chelate, the sixth joint being only shortly produced over the seventh, which is stated to be a male characteristic.

*Locality.* Cape Point E. by N.  $\frac{3}{4}$  N. 34 miles (Cape Colony); depth 480 to 600 fathoms. A 1025.

## TRIBE PENAEIDEA

1888. *Penaeidea*, Bate, Rep. Voy. Challenger, vol. 24, p. 219.

## FAMILY PENAEIDAE.

1881. *Penaeidae*, Bate, Ann. Nat. Hist., Ser. 5, vol. 8, pp. 171,  
 173.

## GEN. GENNADAS, Bate.

1881. *Gennadas*, Bate, Ann. Nat. Hist., Ser. 5, vol. 8, pp. 171, 191.  
 1914. „ „ Balss, Abhandl. K. Bayer. Ak. Wiss., Suppl. vol. 2,  
 pt. 10, p. 4.  
 1914. „ „ Stebbing, Trans. R. Soc. Edinb., vol. 50, pt. 2,  
 No. 9, p. 282 (with synonymy).

## GENNADAS KEMPI, Stebbing.

1914. *Gennadas kempfi*, Stebbing, Trans. R. Soc. Edin., vol. 50,  
 pt. 2, No. 9, p. 283, pl. 27.

In one of the specimens with petasmata, those organs are in precise agreement with the same parts as figured for an example obtained by Dr. Bruce's "Scotia" Expedition. The present specimens have more slender eye-stalks with the lateral process more produced, and the little tooth at the end of the scale of the second antennae is rather longer, but the details in general present no differences. The length of a female specimen was 31 mm., and the male with petasmata well developed was approximately the same. It is no doubt nearly allied to *G. calmani*, Kemp, which appears to be a considerably larger species, and distinguished by a prominent ventral spine on the first pleon segment in both sexes, not found in either sex of the present species.

*Locality.* Cape Point, NE.  $\frac{1}{2}$  N. 47 miles (Cape Colony); depth 700–1,000 fathoms. A 1256.

## GEN. PENAEUS, J. C. Fabricius.

1798. *Penaeus*, J. C. Fabricius, Suppl. Ent. Syst., p. 408.

## PENAEUS JAPONICUS, Bate.

1888. *Penaeus canaliculatus*, Olivier, var. *japonicus*, Bate, Rep. Voy. Challenger, p. 245, pls. 31, 32, fig. 4, pl. 37, fig. 2.  
 1906. „ „ „ Alcock, Catal. Indian Mus. Macrura, fasc. 1, p. 14, pl. 2, figs. 6, 6a–c.  
 1906. „ „ *japonicus*, Nobili, Ann. Sci. Nat., Ser. 9, vol. 4, pp. 6, 10.  
 1911. „ „ „ de Man, Siboga Exp. 39a, p. 107.  
 1914. „ „ „ Balss, Abhandl. K. Bayer. Ak. Wiss., Suppl. vol. 2, pt. 10, pp. 7, 13.

The rostrum of the specimen is broken, but the sculpture of the carapace and the thelycum agree with Alcock's figure, and the telson has three small lateral spines on one margin and two on the other. The length of the specimen, with allowance for the broken rostrum, may be estimated as 140 mm.

*Locality.* Van Staden River, N. by E.  $\frac{1}{2}$  E. 3 miles (St. Francis Bay, Cape Colony); depth 32 fathoms. A 1038.

PENAEUS CANALICULATUS, Olivier.

1811. *Penaeus canaliculatus*, Olivier, Encycl. Méthodique, p. 660.  
 1888. " " Bate, Rep. Voy. Challenger, vol. 24,  
 p. 243, pl. 32, figs. 1, 2.  
 1911. " " de Man, Siboga Exp., vol. 39a, p. 147.  
 1913. " " de Man, Siboga Exp., vol. 39a, pl. 9,  
 figs. 34a, 34b.

Bate's account of this species gives "rostrum slightly arched, furnished on the upper surface with nine teeth, the posterior of which stands on the gastric region a little unequally distant from the preceding, and one tooth on the lower margin immediately below the most anterior of those on the upper." With this our specimen agrees, except in having ten teeth instead of nine, as also with Bate's account of the telson, "acuminate and fringed with hairs at the sides; dorsal median line longitudinally channelled to the apex." It agrees also with de Man's observation that the telson is characterized by bearing no spinules on its lateral margins. So far as could be discovered without dissection the thelycum corresponds with that which de Man figures for the young female. The only point in which the specimen appears to differ from earlier descriptions regards the extension of the rostrum, which reaches beyond the dark bean-shaped eyes, but not nearly to the apex of the peduncle of the first antennae. This peduncle reaches the level of the lateral tooth of the scale of the second antennae. The scale extends some distance beyond this tooth. The flagella of the first antennae are of no great length; the upper stouter one is the shorter. The flagellum of the second antennae measured 70 mm., therefore being longer than the body, which is only 50 mm. The first peraeopods are short, nor are any of the limbs conspicuously elongate. The inner branch of the uropods is longer than the telson and shorter than the outer branch,

in which the marginal tooth is inconspicuous, being close to the apex of the branch.

*Locality.* Bluff Lighthouse, SW. 5 miles; depth 15 fathoms (Durban). A 1190.

PENAEUS PULCHRICAUDATUS, n. sp.

Plate LXVII.

The small slender specimen for which this new species is instituted after long preservation in spirit was still beautifully variegated with lines of little blue spots. The nearest ally appears to be *Penaeus japonicus*, Bate, with which the carapace closely agrees. There are 9 dorsal spines, the hindmost remote from the rest, of which 2 are behind the orbit and the foremost rather remote from the apex and slightly in advance of the single ventral tooth. Between the fourth peraeopods there is a long adpressed spine-like ventral process, and a similar but shorter one between the fifth peraeopods. The sixth pleon segment is longer than the telson, sharply carinate, ending posteriorly in a medio-dorsal tooth, and having a smaller tooth at each postero-lateral angle. The telson is narrowly lanceolate, behind the centre having eight pairs of marginal spines, four pairs successively larger at successively smaller intervals, followed by a series of four microscopical pairs, all outflanked by the last of the large pairs and placed on the converging sides of the apical tongue, which then becomes nearly parallel-sided, with a slight bulge before running out to a point.

The eyes are large, dark, and bean-shaped, with a narrow peduncle. The two pairs of antennae are like those of *P. japonicus*, with which the mouth organs show much agreement, but in place of the very long terminal joint which Bate attributes to the palp of the first maxillae there are here two short joints, together shorter than Bate's long single joint. In the second maxillae the lowest lobe is notable for the paucity of setae; on the apical lobe there are 3 very short spines, and below them on the inner margin a group of denticles. In the second maxillipeds the terminal joint is shorter instead of longer than the preceding joint, and in both second and third maxillipeds the exopod is much less strongly developed than it appears in the figures of *P. japonicus*. This, however, may be referable to the age of the specimen.

In the first, second, and third peraeopods the fingers of the chela are longer than the palm, and the confronting denticulation is more or less limited in its extent. In the first pair groups of little serrate

spines are present subapically on the fifth and proximally on the sixth joint. In the first pair the second and third joints carry each a strong apical spine. In the second pair only the second joint is thus provided. All the peraeopods have exopods, those on the fifth pair being very small. The fifth pair is slightly longer than the fourth, both being considerably shorter than the third. The uropods extend beyond the telson, the outer branch beyond the inner, its small terminal tooth being on a level with the apical margin. Length of specimen 45 mm., the carapace with its rostrum constituting about one-third of this measurement.

*Locality.* Great Fish Point Lighthouse, N.  $\frac{1}{2}$  W., 2 miles (Cape Colony); depth 30 fathoms. A 1046.

GEN. PENAEOPSIS, A. Milne-Edwards.

1881. *Penaeopsis*, A. M.-Edwards in Bate, Ann. Nat. Hist., Ser. 5, vol. 8, pp. 171, 182.  
 1888. „ Bate, Rep. Voy. Challenger, vol. 24, p. 273.  
 1891. *Metapeneus*, Wood-Mason, Ann. Nat. Hist., Ser. 6, vol. 8, p. 271.  
 1906. *Metapeneus*, Alcock, Catal. Indian Decap. Crust., pt. 3, fasc. 1, pp. 5, 7, 16.  
 1909. *Penaeopsis*, Bouvier, Mem. Mus. Comp. Zoöl., vol. 27, No. 3, pp. 205, 220.  
 1911. „ de Man, Siboga Exp., vol. 39a, pp. 8, 53.

This genus, according to Dr. de Man, comprises nearly fifty species. Some of them appear to be very closely connected together.

PENAEOPSIS QUINQUEDENTATUS (de Man).

1902. *Penaeus*, sp., de Man, Abhandl. Senckenb. Naturforsch. Gesell., vol. 25, p. 906, pl. 27, figs. 65, 65a-c.  
 1907. *Metapeneus quinquedentatus*, de Man, Notes Leyden Mus., vol. 29, p. 133.  
 1911. *Penaeopsis q.*, de Man, Siboga Exp., vol. 39a, pp. 8, 71.  
 1913. „ de Man, Siboga Exp., vol. 39a, pl. 7, fig. 23a-d.

Among points to be observed in this species, it may be noted that the carapace is without stridulating ridges, the body is finely tomentose, the rostrum setulose below, with five or six teeth on the convex upper margin, its apex reaching little beyond the large red bean-shaped cornea of the eye. There is a small epigastric tooth at some distance behind the

rostrum. The carina of the pleon is most marked on the sixth segment. The pointed apex of the telson has a subapical process on each side, these processes being completely flanked by a pair of movable spines planted higher up, these in turn being partially flanked by a nearly equal pair further up, succeeded further up by a much smaller pair. The first antennae have a large first joint hollowed out to receive the eye, a shorter but still rather long second joint, twice the length of the third joint, which nearly reaches the apex of the scale of the second antenna; the two flagella are little longer than the two preceding joints of the peduncle combined, the more slender flagellum a little longer than its companion.

The second joint of the palp of the mandible is much larger than the first, widening distally and having a shallow emargination in the setose distal border between the two rounded corners. The second peraeopod is longer than the first, the third than the second, the wrist contributing notably to the successive elongation. The confronting ends of the fingers are microscopically denticulate. The fifth peraeopod is considerably longer than the fourth. The petasmata, as observed in a specimen in which they had not come into contact, and are presumably not fully developed, are in near agreement with those figured by de Man. In a specimen 38 mm. long from apex of rostrum to apex of telson, the carapace measured 12 mm., or 8 mm. without the rostrum, which in this instance had six teeth on the dorsal margin. The sixth pleon segment was nearly 7 mm. long, and the telson slightly over 5 mm., a little shorter than the inner branch of the uropod, which in turn was shorter than the outer branch. In a specimen 38 mm. long, with 5 rostral teeth, the slender flagellum of the second antenna measured 28 mm. in length.

*Locality.* Cape Natal, W. by N.  $6\frac{1}{2}$  miles (Natal); depth 54 fathoms. A 1207.

PENAEOPSIS AFFINIS (Milne-Edwards).

1837. *Penaeus affinis*, Milne-Edwards, Hist. Nat. Crust., vol. 2, p. 410.  
 1906. *Metapeneus a.*, Alcock, Catal. Indian Decap. Crust., pt. 3, fasc. 1, pp. 17, 20, pl. 3, figs. 8, 8a-b (with synonymy).  
 1911. *Penaeopsis a.*, de Man, Siboga Exp., vol. 39a, p. 57.



1913. *Penaeopsis a.*, de Man, Siboga Exp., vol. 39a, pl. 6, figs. 15a, 15b.  
 1914. „ Balss, Abhandl. K. Bayer. Ak. Wiss., Suppl. vol. 2, pt. 10, p. 7.

The separate tooth on the carina of the carapace is followed by eight teeth on the rostrum, which has no ventral teeth and reaches about to the end of the peduncle of the first antennae, this being level with the tooth of the scale of the second antennae. In the first antennae the second joint is stout and long; the flagellum of the second pair is much longer than the body. The telson is dorsally sulcate, sharp-pointed, with lateral setae but not spines. The length of the single dry and brittle specimen is about 52 mm. The place of origin is uncertain, and perhaps the same epithet should be applied to the identification, as thorough examination was not feasible. A 1198.

PENAEOPSIS SPINULICAUDA, n. sp.

Plate LXVIII.

The characters which induce me to name this species as new are to be found in the lanceolate telson which has no large or projecting lateral spines or processes, but numerous little spines within the margins and some that are dorsal among a large number of spicules; further, in the second maxillae, of which the endopod has at the apex two notable spines on one surface and one on the other, and seven or eight little teeth along the inner margin; and further in the symmetrical petasmata, which are fringed along the adjoining margins with innumerable microscopic hooks, and at the two extremities appear to differ somewhat from these organs so far as known in other species.

The rostrum has no ventral teeth but eight dorsal, the last of which is behind the orbit and is followed at a distance by a small tooth on the long carina of the carapace. The eyes are very dark, bean-shaped. In the first antennae the second joint is more than half as long as the first and more than twice as long as the third; the flagella are a little shorter than the first two joints of the peduncle combined, one flagellum for two-thirds of its length much stouter than the other. The scale of the second antennae reaches the end of the peduncle of the first; the flagellum is 96 mm. long.

The mandibles have the molar broad, the second joint of the palp very large and setose, distally narrowed. Lower lip with a small group of setules at the inner corner of the broad lobes. The first

maxillae have a small apical joint, longer than broad, tipped with a seta; the preceding joint has very sinuous margins, with a pellucid transverse band near the apex, behind which the surface has several spines, and the inner margin develops a strong tooth. Second maxillipeds with terminal joint longer than the penultimate, exopod very elongate. Third maxillipeds more slender than the first peraeopods, the long exopod reaching the end of the fifth joint, the epipod strongly furcate. The first peraeopods have the second joint produced into a strong tooth, the short exopod strongly setose, the fifth joint not longer than the chela, in which the palm is much shorter than the fingers; in these the tips are rounded, the confronting margins as usual microscopically denticulate; the brushes of small serrate setae are present distally on the fifth and proximally on the sixth joint. In the much longer second peraeopods, similar to the first as to the tooth and exopod, these brushes are not present, and the fifth joint is much longer than the chela. In the third peraeopods, which are much longer than the second, the fifth joint is twice the length of the chela and the palm is subequal in length to the fingers. The fifth peraeopod is rather shorter than the third, rather more slender than the fourth but considerably longer, and apparently unlike it in having no exopod.

The characters of the first and second pleopods are shown in the figures. The other three pairs have two very unequal branches. The uropods extend considerably beyond the telson, the inner branch without the peduncle being subequal to it in length; the outer branch is broader and rather longer, with a simple unemarginate outer edge, ending in a very small tooth, beyond which the curved strongly setose apical border is scarcely produced. Total length of specimen 65.5 mm., of which the carapace with rostrum occupied 25 mm., the sixth pleon segment 7 mm., and the telson 9.5 mm.

The specimen was obtained by Mr. K. H. Barnard in Durban Bay. In the same gathering were included small specimens which I assign to *Penaeus caeruleus*, and one with seven irregularly spaced dorsal and five ventral teeth on the carapace and elongate rostrum, which I leave for the present undetermined. A 2231.

#### GEN. PARAPENAEUS, S. I. Smith.

1885. *Parapenaeus*, Smith, Pr. U.S. Mus., vol. 8, p. 170.

1899.           ,,           Alcock and Anderson, Ann. Nat. Hist., Ser. 7,  
vol. 3, p. 279.

1901. *Parapeneus*, Alcock, Indian Deep-sea Macrura, p. 14.

1905. *Neopenaeopsis*, Bouvier, Comptes Rendus, vol. 141, p. 747.  
 1906. *Parapeneus*, Alcock, Catal. Indian Deep-sea Macrura, pp. 7, 30, 52.  
 1909. *Parapeneus*, Bouvier, Mem. Mus. Comp. Zoöl., vol. 27, p. 228.  
 1911. „ de Man, Siboga Exp., vol. 39a, p. 77.  
 1913. *Parapeneus*, Balss, Schultze's Forschungsreise in Südafrika, vol. 5, pt. 2, p. 105.  
 1914. *Parapeneus*, Balss, Abhandl. K. Bayer. Ak. Wiss., Suppl. vol. 2, pt. 10, p. 10.

Rostrum without ventral teeth; carapace with longitudinal and vertical sutures usually present; flagella of first antennae not very elongate; "palp" of first maxilla unsegmented; all the pereopods without exopods; no pleurobranch on the last thoracic segment.

Alcock in 1906 retains *P. rectacutus* (Bate) in the genus, though pointing out that its carapace is without the sutures which he includes among the characters of the genus. Dr. de Man notices the difficulty.

PARAPENAEUS FISSURUS (Bate).

Plate LXIX.

1881. *Penaeus fissurus*, Bate, Ann. Nat. Hist., Ser. v., vol. 8, p. 180.  
 1888. „ „ Bate, Rep. Voy. Challenger, vol. 24, p. 263, pl. 36, figs. 1, 1'', 1p, 1z.  
 1899. „ „ Borradaile, Willey's Zool. Results, pt. 4, p. 404.  
 1905. *Parapeneus f.*, Alcock, Ann. Nat. Hist., Ser. 7, vol. 16, p. 520.  
 1906. „ Alcock, Catal. Indian Decap. Macrura, p. 31, pl. 5, figs. 16, 16a, 16b.  
 1911. *Parapeneus f.*, de Man, Siboga Exp., vol. 39a, p. 79.  
 1913. „ de Man, Siboga Exp., vol. 39a, pl. 8, figs. 25a, 25b.  
 1914. „ Balss, Abhandl. K. Bayer. Ak. Wiss., Suppl. vol. 2, pt. 10, p. 10, text-fig. 4.

In the specimens examined the rostrum makes a double curve, with six teeth on its dorsal carina, the last small, at some distance from the upturned apex; the sides are also carinate. Of the seven teeth on the carapace the pair between

the first and second antennae are the largest. The sutures are not easily seen until the carapace is detached. The eyes as preserved are orange-red. In the first antennae the third joint is about half as long as the second, and one flagellum two-thirds the length of the other. The flagellum of the second antenna is considerably longer than the body.

In the palp of the mandible the second joint exhibits remarkable width. The chela of the first peraeopods is not longer than the wrist, the fingers are considerably longer than the palm, their confronting margins microscopically denticulate, the whole limb more setose than those which follow, with minute brushes, distal on the wrist, proximal on the hand, such as are more effectively developed elsewhere in the Caridea. The last four joints of the fifth peraeopods are very decidedly longer than the corresponding four respectively of the fourth pair. The first two-fifths of the telson are broad, the sides then becoming fringed with plumose setae and converging to a sharp apex, but midway or a little beyond sending out a pair of unjointed teeth.

*Locality.* Tugela River, N. by W.  $\frac{3}{4}$  W.  $15\frac{1}{2}$  miles (Natal); depth 40 fathoms. A 1195.

#### HALIPOROIDES, n. g.

Near to *Haliporus*, but distinguished by having the palp of the mandibles three-jointed. Rostrum with one or two teeth on the lower edge. Telson trifurcate. Both flagella of first antenna very elongate. First peraeopods with clasping arrangement of spines between the distal margin of the fifth joint and proximal of sixth.

In 1901 Alcock speaks of Bate's *Haliporus* as having the rostrum "toothed dorsally only, as in all the subgenera of *Peneus* excepting *Peneus* itself." Since then, however, Bouvier and de Man have shown that teeth may occur on the ventral margin in various species of *Haliporus*. Thus Bouvier, commenting on the variability of the rostrum in *H. debilis* (S. I. Smith), says that it has the ventral edge sometimes unarmed, more often armed, with from one to three denticles. The trifurcate telson is noted for some species of the genus, but has not been adopted as a generic character. Similarly the clasping spines of the first peraeopods are not present in some of the species, unless they have been overlooked. I have earlier suggested that the corresponding spines in *Sergestes* may be used as brushes and combs for the long flagella of the antennae.

The many striking points of resemblance between the species for which the new genus is proposed and *Haliporus sibogae*, de Man, 1911, greatly perplexed me in view of the undoubted fact that the new species differed not only from de Man's species, but, so far as I could find, from the whole known range of the Penaeidae in having the palp of the mandible three-jointed. Recently, however, Calman has pointed out that Boas in 1880 assigned a three-jointed palp to the mandible in *Sicyonia*, which he himself has verified for *Sicyonia carinatus* (Olivier), adding the same character for *Bemthesicymus investigatoris*, Anderson, thus for the former species controverting Bate's express statement, and for the latter the generic definition alike of Bate and of Alcock.

HALIPOROIDES TRIARTHURUS, n. sp.

Plates LXX., LXXI.

The carapace has a medio-dorsal carina beginning some way in front of the hind margin, with a slight depression where the arms of the cervical groove nearly meet it; thence it ascends to a denticle, followed by a second, remote and reaching to a point level with the base of the orbit; at a rather less distance a series of eight denticles begins, running along the arch of the rostrum, leaving a space intervening to the upturned apical tooth, behind which on the ventral margin there is a denticle about on a level with the foremost denticle on the upper edge; to the rear the margin is concave, closely fringed with setules. Some specimens have a second ventral denticle. The front of the carapace has on each side a small antero-lateral tooth, a larger antennal tooth leading to a short carina at the back of which is another carinate tooth, while further back and lower down is a denticle at the end of the cervical sulcus. The telson is shorter than the uropods, apically acute, with fringes of setae and two divergent processes, about half as long as the portion of the telson from their bases to its apex.

Both flagella of the first antenna are elongate, one much longer than the other. The flagellum of the second antenna attains a great length, in one specimen, not the largest, being 200 mm. long.

The first joint of the mandibular palp is perfectly distinct, rather broader than long, the very large second joint is almost twice as long as the third, and in its expanded proximal half more than twice as broad. The lower lip is perfectly smooth. The palp or terminal joint of the endopod in both the first and second maxillae is completely fringed on both margins with setae or spines, except for a

small smooth interval near the apex in the second maxillae, to make up for which there is a closely packed group of spines on the surface close to the apex. The second and third maxillipeds agree with all the five pairs of pereopods in having each a minute exopod, the smallness being in striking contrast with the great length of the endopod in the third maxillipeds and most of the following appendages.

For the three chelate pairs of limbs the relations of length between the several joints may be sufficiently estimated by help of the illustrations, as they do not appear to show anything exceptional. It may, however, be noticed that in each pair the teeth of the opposing margins are not continued even half-way along the fingers from their blunt apices. A transparent membrane shielding these marginal teeth is perhaps usual in this family.

The total length of the specimen dissected was 87 mm., the carapace with rostrum being 31 mm. long, the sixth pleon segment 11 mm., and the telson 12.5 mm.

*Locality.* East London NW.  $\frac{1}{2}$  N. 18 miles (Cape Colony); depth 250-300 fathoms. Obtained by Dr. Gilchrist. No. 208. The specific name alludes to the distinctly three-jointed character of the mandibular palp.

#### GEN. MACROPETASMA, n.

A Penaeid with long stiletto-like terminals to the petasma. Rostrum without ventral teeth. Peduncle of first antennae elongate, both flagella rather long. Flagellum of second antennae longer than the body. Second joint of mandibular palp large but distally narrowed. Upper lip and lobes of lower lip broad. An epipod on each of the first three pereopods, an exopod only on the first. Fourth and fifth pereopods very slender.

#### MACROPETASMA AFRICANUS (Balss).

##### Plate LXXII.

1913. *Parapeneus africanus*, Balss, Schultze's Forschungsreise in Süd-afrika, vol. 5, pt. 2, p. 105, text-figs. 1-6.

The rostrum, which reaches just beyond the dark globular eyes, has a variable number of dorsal teeth, 12 according to Balss, 11 in a female, 8 in a male of our specimens; at some distance behind the rostrum there is a small tooth. The sixth pleon segment is more than twice as long as the fifth and much longer than the telson, which is very narrow, the sharply

pointed apex having at the base a pair of articulated spines, above which are three pairs of minute marginal spines, inconspicuous among the plumose marginal setae.

The first joint of the first antennae has a leaf-like appendage at the base, the second and third joints successively shorter, but both rather long, the flagella longer than the peduncle, the shorter one (in the male) being at the base the wider and at a little distance from the base expanding and then abruptly narrowing so as to become less wide than its longer companion. In the second antennae the apical tooth of the scale does not quite reach the top of the setose distal margin.

The characters of the maxillae and maxillipeds are well shown by Dr. Balss; those of the lower lip and one mandible are seen in the present plate; the other mandible appears to have the molar process rather less strongly developed.

The first three pereopods are, as usual in this family, similar in structure, but their difference in size is here very striking, the first pair being very short and the third very long; the first pair differs from the others in having the apparatus of little brushes of spines, serrate on both edges, situate near the base of the hand and distal end of the wrist. The figures sufficiently show the characters of the exopod and epipod attached to this pair. The fourth pair is considerably shorter than the fifth, and is sometimes difficult to observe from its tendency to fold inwards. The thelycum of the female has been figured and described by Dr. Balss.

The petasma of the male appears to be exceptional by the long terminal stilets, to which the generic name alludes. These appendages are very similar to the male organs of some Isopoda, formed by adaptation of the inner branch of the second pleopods. In the present species the second pleopods have the inner ramus represented by two little folded plates with a diminutive terminal flagellum of seven joints. A female specimen, 67 mm. in length, had a carapace just over 19 mm. long, of which the rostrum took barely 7 mm.; the fifth pleon segment was 5.5 mm. long, the sixth 12 mm., the telson 8 mm., the uropods 11 mm., the third pereopods 25 mm., the fifth 20 mm. In the somewhat smaller male specimen from which the figures were drawn, the third pereopods measured 18 mm. and the fifth 15 mm.

*Locality.* Flesh Point N.  $\frac{1}{2}$  W. 2 miles (Mossel Bay, Cape Colony); depth 15 fathoms. A 1206.

## GEN. ARISTAEOMORPHA, Wood-Mason &amp; Alcock.

1891. *Aristaeomorpha*, Wood-Mason and Alcock, Ann. Nat. Hist., Ser. 6, vol. 8, p. 286.
1895. *Plesiopeneus*, Faxon, Mem. Mus. Comp. Zoöl., vol. 18, pp. 197, 199.
1901. *Aristaeomorpha* (subgen.), Alcock, Catal. Indian Deep-sea Macrura, pp. 13, 38.
1908. *Aristaeomorpha*, Bouvier, Camp. Sci. Monaco, fasc. 33, pp. 52, 53 (with synonymy).
1911. *Aristaeomorpha*, de Man, Siboga Exp., vol. 39a, p. 6.

Professor Bouvier in his account of the "Série des *Aristeae*" says, "Premier article des palpes mandibulaires plus étroit et notablement plus court que le second qui est triangulaire et souvent échancré." The peculiar shape of the second joint with its dilated base is no doubt an interesting characteristic of this group, but the preceding joint is shown to be considerably longer, instead of notably shorter, alike in Bate's figure of this palp in his *Aristeus armatus* and in Bouvier's own figures of it in *Hepomadus tener*, Smith, and *Plesiopenaeus edwardsianus* (Johnson).

## ARISTAEOMORPHA ROSTRIDENTATUS (Bate).

1881. *Aristeus rostridentatus*, Bate, Ann. Nat. Hist., Ser. 5, vol. 8, p. 189.
1888. " " Bate, Rep. Voy. Challenger, vol. 24, pp. 221, 317, pl. 51.
1891. *Aristaeomorpha rostridentata*, Wood-Mason and Alcock, Ann. Nat. Hist., Ser. 6, vol. 8, p. 286.
1892. " " Wood - Mason, Illustrations Zool. Investigator, Crust., pl. 2, fig. 1.
1895. *Plesiopeneus rostridentatus*, Faxon, Mem. Mus. Comp. Zoöl., vol. 18, pp. 196, 199.
1901. *Aristaeus* (*Aristaeomorpha*) *rostridentatus*, Alcock, Catal. Indian Deep-sea Macrura, p. 39.
1908. *Aristaeomorpha rostridentata*, Bouvier, Camp. Sci. Monaco, fasc. 33, p. 56.
1911. " " de Man, Siboga Exp., vol. 39a, p. 6.



1912. *Aristeomorpha rostridentata*, Kemp and Sewell, Rec. Indian Mus., vol. 7, pt. 1, p. 17.

The figure, natural size, in the Investigator Illustrations would do service excellently for the South African specimen, except that the latter is not quite so large, and that the last three teeth on its rostrum are more widely spaced. Alcock's description speaks of 10 or 11 carinal teeth. The figure shows only 10, and of these the penultimate is obscure; our specimen has only 8. Bate in 1881 estimated the "flagellum of second pair of antennae about six times the length of the animal"; in 1888 he reduces it to "about four times." In our specimen, much as in that of the Investigator, it does not exhibit so disproportionate a length, but it is imperfect. As in Bate's figure, the second joint of the mandibular palp is not so long as the first. The fourth and fifth peraeopods are remarkably slender. Length of the animal from apex of rostrum to that of telson about 5 inches or 125 mm.

Bate was evidently inclined to remove this species from *Aristeus*, since he observes that in that genus three teeth are the almost constant armature of the rostrum, while here alone a number of small teeth arm it to the apex, and that a small tooth at the anterior extremity of the hepatic region, constant in *Penaeus*, is absent in *Aristeus* in all species except *A. rostridentatus*.

*Locality.* Buffalo River N. 15 miles (East London, Cape Colony); depth 310 fathoms. A 1294.

GEN. EUSICYONIA, nom. nov.

1830. *Sicyonia* (preocc.), Milne-Edwards, Ann. Sci. Nat., vol. 19, p. 339.  
 1837. ,, Milne-Edwards, Hist. Nat. Crust., vol. 2, pp. 405, 408.  
 1849. ,, de Haan, Crust. Japonica, decas 6, pp. 187, 189.  
 1888. ,, Bate, Rep. Voy. Challenger, vol. 24, pp. 219, 292.  
 1895. ,, Faxon, Mem. Mus. Comp. Zoöl., vol. 18, p. 179.  
 1901. ,, Rathbun, Bull. U.S. Fish. Comm., 1900, vol. 2, pp. 100, 103.  
 1906. ,, Rathbun, Bull. U.S. Fish. Comm., 1903, p. 908.  
 1911. ,, de Man, Siboga Exp., vol. 39a, pp. 10, 111.

Milne-Edwards separated the genus from *Penaeus* because the pleopods have only one branch instead of two. He did not take account of the male petasma. Miss Rathbun in 1901

uses the median dentate crest of the carapace to distinguish this genus from *Penaeus*, *Parapenaeus*, and *Xiphopeneus*. In 1911 de Man enumerates twenty named species, a named variety, and two unnamed species as belonging to the genus. Between some of them the distinguishing characters seem to be of slight importance.

EUSICYONIA LONGICAUDA (Rathbun).

Plate LXXIII.

1906. *Sicyonia longicauda*, Rathbun, Bull. U.S. Fish. Comm., 1903, p. 908, pl. 20, fig. 6.  
 1911. „ „ de Man, Siboga Exp., vol. 39a, pp. 11, 113.

The South African specimens are in clear agreement with the figure and the characters supplied by Miss Rathbun, except in an unimportant detail. The rostrum is apically bidentate, the upper tooth projecting a little beyond the lower one. The earlier description gives to the rostrum "tip oblique truncate, with three projections, a tooth between two spines." In describing the telson as having "a pair of lateral spines not far from the tip," it is not unlikely that Miss Rathbun refers to the pair of unjointed processes which occupy the position in question in our specimens. There are three pairs of microscopic spines spaced higher up, and much of the telson is fringed with plumose setae. In the first antennae the lower spine-tooth of the first joint does not nearly reach the base of the apical tooth. In the first maxilla the outer plate or palp has two setae at the inner corner of its apex, and within the outer margin has a row of seven spines on the surface. The second maxilla has three very small stumpy spines about the apex. The first pleopod shows a little wart-like piece apparently distinct from the peduncle by the side of the single ramus.

The largest of the South African specimens was about 56 mm. long, the carapace with rostrum measuring 19.5 mm., the fifth pleon segment 5 mm., the sixth 8 mm., the telson 8.5 mm. The uropods were slightly shorter than the telson, both branches with rounded apices.

*Locality.* Buffalo River N. 15 miles (East London, Cape Colony); depth 310 fathoms. A 1219.

## FAMILY LEUCIFERIDAE.

1852. *Sergestidae*, Dana, U.S. Expl. Exp., vol. 13, pp. 601, 608 (in Penaeidea).  
 1852. *Luciferidae*, Dana, U.S. Expl. Exp., vol. 13, figs. 636, 639, 668 (in Mysidea).  
 1888. *Sergestidae*, Bate, Rep. Voy. Challenger, vol. 24, pp. 219, 345 (sub-family *Sergestinae*, p. 345, *Luciferinae*, p. 443).  
 1896. „ Hansen, Pr. Zool. Soc. London, p. 937.  
 1905. „ Faxon, Mem. Mus. Comp. Zoöl. Harvard, vol. 18, p. 208.  
 1914. „ Illig, Deutsche Südpolar-Exp., vol. 15 (Zool. 7) p. 349.  
 1914. *Leuciferidae*, Stebbing, Trans. Roy. Soc. Edinb., vol. 5, pt. 2, p. 284.

If the right of primogeniture is admitted, the genus *Lucifer* is entitled to give its name to the family, having been born a year sooner than the rival claimant *Sergestes*. The genus itself, having been properly instituted, does not lose its privilege, although the name originally given to it was preoccupied, and therefore yields to another.

## GEN. LEUCIFER, Milne-Edwards.

1829. *Lucifer*, Vaughan Thompson, Zoological Researches, vol. 1, pt. 1, mem. 3, p. 68 (not *Lucifer*), Linn., Amoen. Acad., vol. 6, p. 70, 1760, Sherborn, nor *Lucifer*, Lesson, Aves, ? 1829.  
 1831. „ Latreille, Cours d'Entomologie, p. 386.  
 1837. *Lucifer*, Milne-Edwards, Hist. Nat. Crust., vol. 2, p. 467 (in Tribu des Leuciferiens).  
 1852. *Lucifer*, Dana, U.S. Expl. Exp., vol. 13, pp. 639, 668.  
 1880. *Leucifer*, Boas, Vidensk. Selsk. Skr., Ser. 6, vol. 1, pp. 37, 165.  
 1888. *Lucifer*, Bate, Rep. Voy. Challenger, vol. 24, pp. 443-469.  
 1896. *Leucifer*, Hansen, Pr. Zool. Soc. London, p. 937.  
 1903. *Lucifer*, Ortman, Ergebn. Plankton Exp., vol. 2, G. b., pp. 71, 108.  
 1904. *Leucifer*, Calman, Ann. Nat. Hist., Ser. 7, vol. 13, p. 151.  
 1905. *Lucifer*, Faxon, Mem. Mus. Comp. Zoöl. Harvard, vol. 18, p. 208.

Vaughan Thompson enlarges on the characters of the genus

and species, but, while supplying illustrative figures of the latter, he gives it no name. Milne-Edwards, after describing the genus under an altered name, assigns to it first a new species, *L. reynaudii*, and then secondly distinguishes Thompson's species, for which he supplies the name *typus*, in a footnote misquoting Thompson as authority for the generic name *Leucifer*. Milne-Edwards speaks of his *L. reynaudii* as being about 4 inches long. His enlarged figure of it, however, only measures 3 inches, and a line indicating the natural size is 14 mm. long, not very greatly in excess of Dana's measurement for the same species. Dana adds three species to the genus—*L. aestra*, *pacificus*, and *acicularis*. The first of these is regarded by Faxon as probably identical with *L. reynaudii*, and the second is made a synonym of *L. typus* by Bate, who says (*loc. cit.* p. 448): "So far as I can determine, there are only two species of *Lucifer*." Later Hansen states that there are four species preserved in the Copenhagen Museum.

LEUCIFER TYPUS, Milne-Edwards.

1829. *Lucifer*, sp., Vaughan Thompson, Zool. Researches, vol. 1, pt. 1, Mem. 3, pp. 58, 67, pl. 7, fig. 2, the animal enlarged and natural size, parts, 1c, 2c, f1, f3, a1, a2, s, e, t.
1837. *Leucifer typus*, Milne-Edwards, Hist. Nat. Crust., vol. 2, p. 469.
1888. *Lucifer t.*, Bate, Rep. Voy. Challenger, vol. 24, p. 464, pl. 83.

Adult males, a little over 8 mm. long, clearly belonging to this species, were taken at the surface.

*Locality.* Seven miles SE. from Flesh Point (Mossel Bay, Cape Colony); surface. A 1563.

TRIBE CARIDEA.

1852. *Caridea* (part), Dana, U.S. Expl. Exp., vol. 13, p. 528.

FAMILY CRANGONIDAE.

1853. *Crangonidae*, Bell, British Stalk-eyed Crustacea, p. 255.
1910. „ Kemp, Fisheries, Ireland, Sci. Invest., 1908, i. [1910], p. 134.

## GEN. SCLEROCRANGON, G. O. Sars.

1885. *Sclerocrangon*, Sars, Norske Nordhavs Exp., vol. 14, Crustacea, vol. 1, p. 14.
1886. „ S. I. Smith, Rep. U.S. Fish. Comm. for 1885, p. 652 (48).
1895. „ Faxon, Mem. Mus. Comp. Zoöl., vol. 18, p. 132.
1910. „ Kemp, Fisheries, Ireland, Sci. Invest., 1908, i. [1910], pp. 135, 139.
1914. *Crangon* (*Sclerocrangon*), Balss, Abhandl. K. Bayer. Ak. Wiss., Suppl. vol. 2, pt. 10, pp. 62, 65.

## SCLEROCRANGON BELLMARLEYI, n. sp.

## Plate LXXIV.

The new species is closely allied to two earlier members of the genus. The first of these was named *Pontophilus jacqueti* by A. Milne-Edwards in 1881, *Ceraphilus agassizii* by Smith in 1885, *Sclerocrangon agassizii* by Smith in 1886, *S. jacqueti* by Faxon in 1895, and more decidedly by Kemp in 1910. The name *Ceraphilus* was no doubt an oversight for *Cheraphilus*. The second allied species is *Sclerocrangon procax*, Faxon, 1895. In the sculpture of the carapace the new species shows general agreement with its allies, but with some differences of detail. Thus the supra-ocular teeth are not produced nearly as far as the short rostrum, the large ascendant process over the rostrum is common to both sexes, the smaller median process behind it is set more forward than in either of the other species, and so is the little marginal tooth to the rear of the large antero-lateral processes. In our specimens the pleon is without medio-dorsal carina except a faintly expressed blunt one on the sixth segment, which has its lateral carinae well marked. In these respects, however, they agree with the variety of *S. jacqueti* which Kemp has figured. From that species they differ in having, like *S. procax*, a longer second joint to the first antennae. The scale of the second antennae is narrow in *S. procax*, apically bifid into two processes, both figured as acute. In the other two species the scale is broad, in *S. jacqueti* having a normal tooth with no bifid appearance, such as is produced in the new species by a tooth with a broad base and a serrate inner margin the tip of which is on a level with the setose rounded part of the apical margin.

The eyes are not very small, with no perceptible tubercle, dark red as preserved.

The mouth organs agree fairly well with those figured by Sars for the typical species, but the mandible has the cleavage of its bifid apex more distinct or less overlapping than as shown for that species, and the vibratory fan of the second maxilla has its lower portion much broader. The middle plate of the first maxilla has six spines instead of four, and the outer border of the palp has only two setae instead of a fringe. The endopod of the first maxilliped is shorter in relation to its exopod than that figured by Sars.

The large subchelate first peraeopods, the slender second with their small chela, the slender third pair with needle-like sixth and seventh joints, and the stouter fourth and fifth pairs, do not offer any striking differences from those of the allied species. Differences in the relative lengths of joints are only such as may be referred to individual variation.

The first pleopods have the small inner branch distally narrowed as if to serve the purpose of a coupling apparatus, but no hooked spine could be perceived, nor is such apparatus present on any of the following pairs. Faxon says of *S. procax* that "the terminal segment of the inner branch of the second abdominal appendage in the male bears on its inner margin a short blunt stylamblys, which is absent in *S. agassizii*." I cannot see any indication of this in his figure of the second pleopod in question. In our species the inner branch is distally bilobed, the inner lobe the longer, both distally setose. The following pleopods have each a small simple inner branch, these branches in each pair set so far apart that they could not easily be coupled together. The medio-ventral spines between them appear to be characteristic of the male sex.

The female specimen is 40 mm. long, and much more bulky than the male, which measured only 22 mm. in length.

*Locality.* Cape Natal N. by E. 24 miles (Natal); depth 440 fathoms. A 1564.

The specific name is given out of respect to Mr. W. H. Bell-Marley, of Durban, to whose kindness I am indebted for various interesting specimens. The present species must, I think, be regarded as a connecting link between *S. jacqueti* and *S. procax*.

#### FAMILY PALAEMONIDAE.

1910. *Palaemonidae*, Stebbing, Ann. S. African Mus., vol. 6, p. 383 (with synonymy).

## GEN. LEANDER, Desmarest.

1849. *Leander*, Desmarest, Ann. Soc. Entom. France, Sér. 2, vol. 7, pp. 87, 91.  
 1914. „ Stebbing, Tr. R. Soc. Edinb., vol. 50, pt. 2, No. 9, p. 286 (with synonymy).

## LEANDER SERRIFER, Stimpson.

1860. *Leander serrifer*, Stimpson, Pr. Ac. Sci. Philad., vol. 12, p. 41 (110).  
 1890. „ „ Ortman, Zool. Jahrbüch., vol. 5, pp. 521, 525, pl. 37, fig. 17.  
 1902. *Palaemon s.*, Rathbun, Pr. U.S. Mus., vol. 26, p. 52.  
 1902. *Leander s.*, Doflein, Abhandl. K. Bayer. Ak. Wiss., vol. 21, pt. 3, p. 640.  
 1914. „ Balss, Abhandl. K. Bayer. Ak. Wiss., Suppl. vol. 2, pt. 10, p. 57.

A single specimen, 60 mm. in length, has on the carapace ten dorsal teeth, two of which are behind the orbit. There are four ventral teeth to the rostrum, which is as long as the scale of the second antennae. The short flagellum of the first antennae has at the base the marking of eight coalesced joints with several more than twenty joints free. In the first peraeopods the chela is much shorter than the wrist, with its fingers longer than the palm. In the second peraeopods the wrist, rather shorter than the fourth joint, is 8 mm. long, while the chela is 10 mm., of which the palm occupies 6.5 mm.

*Locality.* Baakens River, Swartkop R., Port Elizabeth (Cape Colony). A 1277.

## FAMILY ALPHEIDAE.

1899. *Alpheidae*, Coutière, Thèse à la Faculté des Sciences de Paris (with synonymy).

## GEN. OGYRIDES, nom. nov.

1860. *Ogyris* (preocc.), Stimpson, Pr. Ac. Sci. Philad., vol. 12, p. 36 (105).  
 1880. „ Kingsley, Pr. Ac. Sci. Philad., 1879, p. 420.  
 1893. „ Ortman, Ergebn. Plankton Exp., vol. 2, G. b. p. 45.

1911. *Ogyris*, de Man, Siboga Exp., vol. 39a, p. 135.

1914. „ Balss, Abhandl. K. Bayer. Ak. Wiss., Suppl. vol. 2, pt. 10, p. 37.

Ortmann distinguishes three species, the original *O. orientalis*, Stimpson, *O. alphasirostris*, Kingsley, in both of which the wrist of the second peraeopod is three-jointed, and his own *O. occidentalis*, which has a four-jointed wrist. Dr. de Man adds *O. sibogae*, which also has a quadriarticulate carpus, but only four teeth on the dorsal carina.

#### OGYRIDES OCCIDENTALIS (Ortmann).

1893. *Ogyris occidentalis*, Ortmann, Ergebn. Plankton Exp., vol. 2, G. b. p. 46, pl. 3, figs. 4, 4a, d, f-i, k-s, z.

Ortmann mentions that the denticles on the medio-dorsal carina of the carapace number from seven to nine. In our specimens examined it varied from six to eight. The palp of the first maxilla has a bilobed apex, with a seta on each lobe. In the second maxilliped the third joint is much broader than the fourth, and the broad seventh joint, which is not at all finger-like, is remarkable for its size. As in the other species the long stalks of the small eyes are a notable feature. Length from apex of carapace to that of telson 15 mm.

*Locality.* Saldanha Bay (Cape Colony); depth 10 fathoms. A 1298.

With this species there occurred a specimen of the curious amphipod, *Platyischnopus mirabilis*, Stebbing.

#### FAMILY PASIPHAEIDAE.

1852. *Pasiphaeidae*, Dana, U.S. Expl. Exp., vol. 13, pp. 532, 536.

1908. „ Lagerberg, Göteborgs K. Vet. Handl., Ser. 4, vol. 11, p. 5.

1914. „ Stebbing, Tr. R. Soc. Edinb., vol. 50, pt. 2, p. 293 (with synonymy).

#### GEN. PARAPASIPHAË, S. I. Smith.

1884. *Parapasiphaë*, Smith, Rep. U.S. Fish Comm., 1883, p. 383 (39).

1901. *Parapasiphaea*, Alcock, Catal. Indian Deep-sea Macrura, pp. 58, 64.



1910. *Parapasiphaë*, Kemp, Fisheries, Ireland, 1908, pp. 37, 47.  
 1914.            ,,            Stebbing, Tr. R. Soc. Edinb., vol. 50, pt. 2,  
                                   p. 294.

The mandibles have a slender two-jointed palp.

PARAPASIPHAË SULCATIFRONS, S. I. Smith.

1884. *Parapasiphaë sulcatifrons*, Smith, Rep. U.S. Fish Comm.,  
                                   1883, p. 384 (40), pl. 5, fig. 4,  
                                   pl. 6, figs. 1-7.  
 1886.            ,,            ,,            Smith, Rep. U.S. Fish Comm.,  
                                   1885, pp. 5, 8, 12, 13, 15, 79.  
 1908.            ,,            ,,            Hansen, Danish Ingolf Exp.,  
                                   vol. 3, pt. 2, p. 79.  
 1910.            ,,            ,,            Kemp, Fisheries, Ireland, 1908,  
                                   p. 47, pl. 5, figs. 1-21.  
 1913. *Parapasiphae*            ,,            Stephensen, Meddel. om Grön-  
                                   land, vol. 22, p. 48.

The South African specimen agrees completely with the excellent figures and description supplied by Professor S. I. Smith, and corroborated by Mr. Stanley Kemp, who in addition gives interesting information as to the development. In this species the rostrum is much shorter than in the Indian species of the genus described by Colonel Alcock. The mouth organs in this genus have several noteworthy peculiarities, such as the abrupt narrowing of the palp in the first maxillæ. Our specimen measured 79 mm. in length, of which the carapace occupied 28 mm. and the telson 12·5 mm.

*Locality.* Cape Point ENE. 36½ miles (Cape Colony); depth 660 fathoms. A 1255.

GEN. PHYE, Wood-Mason.

1893. *Phye*, Wood-Mason, Ann. Nat. Hist., Ser. 6, vol. 11, p. 164.  
 1914.            ,,            Stebbing, Tr. R. Soc. Edinb., vol. 50, pt. 2, p. 294.

PHYE PACIFICUS (Rathbun).

1902. *Pasiphaea pacifica*, Rathbun, Pr. U.S. Mus., vol. 24, p. 905.  
 1904.            ,,            ,,            Rathbun, Decap. Crust. NW. coast N.  
                                   America, p. 20, text-figs. 2, 3.

The South African specimen shows no difference of any importance from Miss Rathbun's figures and description. The front is rounded at the centre; behind this a small

forward pointing tooth rises, the upper edge of which is continued in a carina almost to the end of the carapace; the pleon is carinate from the second to the end of the sixth segment without any tooth-like extension. The sixth segment is rather longer than the furcate telson, the fork of which is fringed with 22 graduated spines. The palpless mandible has a cutting edge of 12 teeth, one of them minute, the largest double. The middle plate of the first maxilla is fringed with 13 spines, the inner plate has only armature on one corner, the palp, not abruptly narrowed, carries 8 setae. The first peraeopod has 3 spines on the inner margin of the fourth joint, the second 19 on the corresponding margin, with 7 on the margin of its second joint, of which Miss Rathbun only says that it "is armed with a small spine at the distal end of its inferior margin." Total length of specimen in median line 103 mm., the carapace accounting for 33 mm., the sixth pleon segment 13.5 mm., and the telson 11.5 mm.

*Locality.* Cape Natal N. by E. 24 miles (Natal); depth 440 fathoms. A 1254.

#### FAMILY HIPPOLYTIDAE.

1910. *Hippolytidae*, Stebbing, Ann. S. African Mus., vol. 6, pt. 4, p. 390 (with synonymy).

#### GEN. SARON, Thallwitz.

1891. *Saron*, Thallwitz, Zool. Anzeiger, vol. 14, p. 99.  
 1906. „ Calman, Ann. Nat. Hist., Ser. 7, vol. 17, p. 30.

Calman, in his provisional synopsis of the family Hippolytidae, distinguishes this genus as having arthrobranchiae at the bases of the first four pairs of peraeopods, mandibles with incisor process and palp, more than seven jointlets in the wrist of the second peraeopods, and a movable spine at the base of the second peraeopods.

#### SARON MARMORATUS (Olivier).

1811. *Palaemon marmoratus*, Olivier, Encycl. Méth., vol. 8, p. 665.  
 1852. *Hippolyte gibbosus*, Dana, U.S. Expl. Exp., vol. 13, p. 565, pl. 36, fig. 4a-e.  
 1891. *Saron gibberosus*, Thallwitz, Zool. Anzeiger, vol. 14, p. 99.

1898. *Saron marmoratus*, Borradaile, Pr. Zool. Soc. London, p. 1009.  
1906. *Spirontocaris marmorata*, Rathbun, U.S. Comm. Fish for 1903,  
pt. 3, p. 913.  
1914. „ *gibberosa*, Balss, Abhandl. K. Bayer. Ak. Wiss.,  
Suppl. vol. 2, pt. 10, p. 46.

For this species Borradaile supplies an ample synonymy, with explanatory discussion. Miss Rathbun supplements Borradaile's reference to Olivier by giving the page, and the reference to the Atlas of the Encycl. Méth., vol. 24, pl. 319, fig. 3, 1818; but appears to be unaware of the contributions to the literature of the subject by Thallwitz and Borradaile. In 1904 Miss Rathbun enumerated no fewer than 51 species of *Spirontocaris* as found in the Pacific, and exhibiting great diversity in form. Since then two more species have been added to that genus by Rathbun and two by Brashnikow, if the generic name *Euales*, which he used for one of them, is to be considered a synonym of *Spirontocaris*. According to Calman's synopsis in *Spirontocaris* (with several synonyms) there are no arthrobranchiae on the peraeopods, only seven jointlets in the wrist of the second peraeopods, and the mandibular palp is two-jointed. In *Saron marmoratus* I find the mandibular palp three-jointed, so that at least that species is properly withdrawn from *Spirontocaris*. But, as even the numbers above mentioned do not show the complete series of species at present assigned to that genus, it may eventually prove desirable to make a much more extensive redistribution of its members.

The single South African, or rather South-east African, specimen exactly resembles Dana's figure in the dentation of the carapace, but in addition has many tufts of feathered setae. The mandibles have a long molar and four small distinct teeth to the cutting edge. In the first maxillae the apex of the palp is emarginate, with a strong spine on the inner corner. The vibratory plate of the second maxillae is short, the apical plate of the endopod narrow, tipped with one long and two short setae, the intermediate lobes large, but the lower small, with the upper division insignificant. In the first and second maxillipeds the exopod extends much beyond the endopod and in the second is attached to a joint compounded of the second and third joints, with the fourth and fifth joints small, the sixth and transversely attached seventh large. The long third pair do not reach the end of the scale of the second

antennae, carry long feathered setae, and have an exopod which does not reach the end of the antepenultimate joint. First peraeopods much stouter than second. Wrist of second peraeopods with not fewer than ten jointlets. The carapace with rostrum measures 16 mm., the remainder of the body 20 mm.

*Locality.* Mozambique, where the specimen was obtained by Mr. K. H. Barnard. A 2215.

#### FAMILY PANDALIDAE.

1888. *Pandalidae*, Bate, Rep. Voy. Challenger, vol. 24, pp. 480, 625.  
 1901. „ Alcock, Catal. Indian Deep-sea Macrura, pp. 55, 56, 91 (with synonymy).  
 1902. „ Doflein, Abhandl. K. Bayer. Ak. Wiss., vol. 21, pt. 3, p. 615.  
 1904. „ Rathbun, Harriman Alaska Exp., p. 43.  
 1910. „ Calman, Ann. Nat. Hist., Ser. 8, vol. 5, p. 524.  
 1914. „ Balss, Abhandl. K. Bayer. Ak. Wiss., Suppl. vol. 2, pt. 10, p. 27.

#### GEN. PANDALUS, Leach.

1814. *Pandalus*, Leach, Edinb. Encycl., vol. 7, p. 432.

#### PANDALUS MODESTUS, Bate.

1888. *Pandalus modestus*, Bate, Rep. Voy. Challenger, vol. 24, p. 670, pl. 114, figs. 4, 4b, k, l, l', m.

Bate's 3 specimens were obtained by the "Challenger" at the Agulhas Bank, from a depth of 150 fathoms. The 3 specimens from the South African Museum are without notification of special locality. Though all imperfect, they show so many points of agreement with Bate's account that I am disposed to attribute discrepancies either to his imperfect observation or to variation within the species. Thus the only perfect carapace has 8 dorsal teeth, of which 5 with appearance of articulation are behind the orbit, the remaining 3 on the rostrum are not articulated; there are only two little ventral teeth, both in advance of the dorsal series. According to Bate "the frontal margin beyond the orbit has no well-defined teeth." In our specimen it has a well-marked antennal tooth, and a small antero-lateral.

Of the first antennae the more robust flagellum is also the longer. The stilliform extremity of the first peraeopods appears to have an apical slit. Bate speaks of the second peraeopods as unequally long and slender. Each of our specimens has only one member of the pair, the wrist in two instances being four-jointed, in the third instance much longer and obscurely multiarticulate, thus among them agreeing with Bate's figures for this pair. The last three pairs of peraeopods are in agreement with Bate's account, except that the curved fingers, instead of only 2 teeth on the concave border, have on its proximal part a series of 4 or 5 slender spines, successively larger towards the apex. Bate says that the first pair of pleopods is single-branched. In our specimen it has a short but conspicuous inner blade. The uropods are longer than the telson, their rami nearly equal in length, the broader outer one prolonged beyond the lateral tooth in a broadly rounded apex. The narrow telson has 7 pairs of lateral spines and 2 pairs that are much longer on the irregularly truncate apex. Total length of the specimen specially examined, not quite the largest, was 23.5 mm., of which the carapace with rostrum occupied a little more than 7 mm.

Locality uncertain. A 1280.

GEN. PLESIONIKA, Bate.

1888. *Plesionika*, Bate, Rep. Voy. Challenger, vol. 24, pp. 626, 640.  
 1899. *Parapandalus* (part), Borradaile, Willey's Zool. Results, pt. 4, pp. 396, 411.  
 1901. *Plesionika*, Alcock, Catal. Indian Deep-sea Macrura, pp. 91-94.  
 1910. „ Stebbing, Ann. S. African Mus., vol. 6, p. 392.  
 1914. „ Balss, K. Ak. Wiss., Wien, Ak. Anzeiger, No. 9, p. 1.

Alcock distinguishes *Plesionika*, in which there are epipodites on the first four pairs of paraeopods, from *Parapandalus* which has no epipodites on those limbs, with the result, as Balss points out, that *Parapandalus longirostris*, Borradaile, must be transferred to *Plesionika*.

PLESIONIKA LONGIROSTRIS (Borradaile).

1899. *Pandalus* (*Parapandalus*) *longirostris*, Borradaile, Willey's Zool. Results, pt. 4, pp. 396, 413, pl. 37, figs. 10, 10a-h.  
 1914. *Plesionika l.*, Balss, K. Ak. Wiss., Wien, Ak. Anzeiger, No. 9, p. 1.

Although a length of not more than 2 inches might be expected to distinguish our specimens from those which Dr. Willey collected in New Britain, exceeding a length of 5 inches, yet in most other respects the South African examples show very exact agreement with Borradaile's description and figures of his species. The upturned rostrum is a striking feature, being about twice the length of the trunk of the carapace in the medio-dorsal line, armed above and below with teeth, those at the base above being for the most part longer and further apart than those towards the free end. But Borradaile both in his sub-generic definition and in his description of this species speaks of movable spines, which cannot be reconciled either with his figure or with our specimens. It may be noticed indeed that Alcock omits the character from the definition of *Parapandalus* as restricted, and in describing *Pandalus (Parapandalus) spinipes* (Bate) expressly states that the serrations of the rostrum in that species are comb-like and fixed, while to *Plesionika* he assigns a "rostrum armed dorsally with fixed teeth and sometimes with movable teeth also." The figures of the mouth organs in Borradaile's plate are all characteristic of those in the South African specimens, except that in the cutting plate of the mandible each external tooth of the five is larger than any of the three intermediate teeth. The other member of the pair of mandibles differs a little from its fellow in having six teeth. The second maxilliped has the very short broad seventh joint more distinct than might be expected from the figure. The first pereopods have on the distal part of the fifth joint and the proximal part of the sixth several transverse rows of short spines or stiff setules, which may perhaps be of use for cleansing the long flagella of the two pairs of antennae. The second pair of pereopods with their small setose chela and many-jointed wrist are equal. The narrow end of the telson carries a short spine flanked by two long ones.

*Locality.* Cape Natal, W. by N.  $\frac{3}{4}$  N. 11 miles (Natal); depth 185 fathoms. A 1272.

GEN. HETEROCARPUS, A. Milne-Edwards.

1881. *Heterocarpus*, A. Milne-Edwards, Ann. Sci. Nat., Ser. 6, vol. 11, art. 4, p. 8.

1888. *Heterocarpus*, Bate, Rep. Voy. Challenger, vol. 24, pp. 480, 626, 627.
1893.        "        Stebbing, History of Crustacea, p. 238.
1895.        "        Faxon, Mem. Mus. Comp. Zool. Harvard, vol. 18, p. 148.
1901.        "        Alcock, Catal. Indian Deep-sea Macrura, pp. 92, 102.
1912.        "        Kemp and Sewell, Records Indian Mus., vol. 7, pt. 1, p. 20.

Bate, in describing the genus, says that the two long and slender flagella of the first antennae "both only reach a little beyond the distal extremity of the rostrum," but his figure of *H. gibbosus* contradicts this, and in his description of the species he states that of these flagella "the longest is nearly as long again as the rostrum." Of the nearly allied *H. tricarinatus* Alcock and Anderson say that "the subequal antennular flagella are more than three-fourths the length of the body, rostrum included."

HETEROCARPUS TRICARINATUS, Alcock and Anderson.

1894. *Heterocarpus tricarinatus*, Alcock and Anderson, J. Asiat. Soc. Bengal, vol. 83, pt. 2, p. 14 (154).
1901.        "        "        Alcock, Catal. Indian Deep-sea Macrura, pp. 103, 107; Zool. Investigator, Crustacea, pl. 51, fig. 1.

The authors distinguish this species from *H. gibbosus*, Bate, 1888, "by its smaller size, and by the indistinctness of the lower lateral carina, which fades completely before reaching the posterior half of the carapace." Alcock in 1901 says: "In an egg-laden female the length of the rostrum is 21 millim., of the carapace 24 millim., of the abdomen 49 millim." The rough measurements taken of our single South African specimen agree almost to a nicety with the foregoing, thus giving in each case a total length of  $3\frac{3}{4}$  inches. Bate gives the entire length of his species as 43 mm., but to that must evidently be added 20 mm. for the rostrum and 5 mm. for the telson, bringing the total to 68 mm.; even so, however, the small size is no doubt due to immaturity, since Alcock records an egg-laden Indian specimen measuring 156 mm. in length, thus leaving *H. tricarinatus* much inferior in that respect,

though it has the more numerous dorsal spines on the rostrum and the more extensively developed flagella on the first and second antennae.

In our specimen the eyes have an unusual appearance, the dark red cornea being mapped out into quadrangular areas of different sizes, an effect due to the vicissitudes of captivity and travel. The carapace has 8 teeth on the medio-dorsal carina, the hindmost 3 very small; it has 6 on the rostrum dorsally and 8 very distinct ventrally with one or more among the setules close to the orbit. The flagella of the first antenna are elongate, distally of extreme tenuity; the flagellum of the second antenna is considerably over 100 mm. long. The two second peraeopods are very unequal, and the fourth pair much longer than the fifth.

*Locality.* Buffalo River, N. 15 miles (East London, Cape Colony); depth 310 fathoms. A 1292.

#### HETEROCARPUS ALPHONSI, Bate.

1888. *Heterocarpus alphonsi*, Bate, Rep. Voy. Challenger, vol. 24, pp. 629, 632, pl. 112, fig. 1, 11, 11".  
 1891. " " Wood-Mason and Alcock, Ann. Nat. Hist., Ser. 6, vol. 7, p. 196.  
 1892. " " Wood-Mason and Alcock, Ann. Nat. Hist., Ser. 6, vol. 9, p. 367.  
 1901. " " Alcock, Catal. Indian Deep-sea Macrura, pp. 103, 106.

From other species of the genus Alcock distinguishes this as having the third, fourth, and fifth pleon segments sharply carinate, and each prolonged into a backward pointing tooth, the other pleon segments not carinate, the sixth not twice as long as the fifth and shorter than the telson. Length of the South African specimen from tip of the long slender rostrum to end of telson about 5 inches. The rostrum has 11 teeth on the lower edge, above 9 teeth are spaced along the rostrum on to the body of the carapace.

*Locality.* Cape Natal N. by E. 24 miles (Natal); depth 440 fathoms. A 1291.

#### HETEROCARPUS LAEVIGATUS, Bate.

1888. *Heterocarpus laevigatus*, Bate, Rep. Voy. Challenger, vol. 24, p. 636, pl. 112, fig. 3.



1899. *Heterocarpus laevigatus*, Alcock and Anderson, Ann. Nat. Hist., Ser. 7, vol. 3, p. 285; Illustrations, Investigator, pl. 41, figs. 1, 1a.
1901.       "               "       Alcock, Indian Deep-sea Macrura, pp. 103, 105.

Alcock's figure of this species differs from that given by Bate in having more numerous ventral teeth to the long upward pointing rostrum. The two agree in having the foremost of the five teeth on the medio-dorsal carina in advance of the eye. In the South African specimen that tooth is over the eye not in advance of it; and the ventral teeth of the rostrum are ten in number. According to Alcock and Anderson "the under margin of the rostrum is armed with eleven to thirteen teeth."

*Locality.* East London NW.  $\frac{1}{2}$  N. 20 miles (Cape Colony); depth 408 fathoms. A 1295.

GEN. CHLOROTOCUS, A. Milne-Edwards.

1882. *Chlorotocus*, A. Milne-Edwards, Rapport Comm. pour la faune sous marine, p. 18.
1883.       "       A. Milne-Edwards, Recueil figs. Crust. Nouv., pl. 16.
1888. ?       "       Bate, Rep. Voy. Challenger, vol. 24, pp. 627, 673.
1901.       "       Alcock, Indian Deep-sea Macrura, pp. 92, 100.
1902.       "       de Man, Abhandl. Senckenb. Nat. Gesellschaft, vol. 25, pt. 3, p. 856.
1914.       "       Balss, Abhandl. K. Bayer. Ak. Wiss., Suppl. vol. 2, pt. 10, p. 33.

From the other Pandalidae this genus is distinguished by having the wrist of the second peraeopods only bipartite. The first peraeopods are simple.

For the single South African specimen which Bate assigned to this genus as *C. incertus*, he figured and described the palp of the mandible as two-jointed, and in place of a dentate cutting edge represented a sort of stiletto. On each side of the rostrum he gave an orbital tooth, but no antero-lateral tooth below. Also, according to Alcock, the branchial formula which he gives does not conform with that of the type-species, *C. gracilipes*, at least as represented by the variety *anda-*

*manensis*. Bate also mentions the presence of an ocellus, of which Alcock says the eye is devoid.

CHLOROTOCUS CRASSICORNIS (A. Costa).

Plate LXXXV.

1871. *Pandalus crassicornis*, A. Costa, Annuario Mus. Zool. R. Univ. Napoli, Ann. 6, p. 89, pl. 2, fig. 2.
1882. *Chlorotocus gracilipes*, A. Milne-Edwards, Archiv. Missions scient. littér. (3), vol. 9 (Senna), p. 18 (Bate).
1883.     "     "     A. Milne-Edwards, Recueil figs. Crustacés, pl. 16.
1885.     "     "     Carus, Prodromus faunae Mediterraneae, vol. 1, p. 474, and *Pandalus crassicornis*, p. 477.
1888.     "     "     Bate, Rep. Voy. Challenger, vol. 24 pp. 674, 681.
1904.     "     *crassicornis*, Senna, Annuario Mus. Zool. R. Univ. Napoli, n. ser., vol. 1, No. 18, pp. 1-3, fig. 1 (with synonymy).
1914.     "     *gracilipes*, Balss, Abhandl. K. Bayer. Ak. Wiss., Suppl. vol. 2, pt. 10, p. 33.

The carapace has 11 or 12 dorsal teeth, 4 behind the orbit, the rest on the rostrum, which beyond the eye has 5 ventral teeth; on each side of the rostrum there is an orbital tooth and an antero-lateral tooth below. The telson has five pairs of dorso-lateral spines, the last pair adjoining the abruptly narrowed apex, which is flanked by a pair of much longer spines and bordered with long setae. The fifth pleon segment has no postero-lateral tooth; the sixth is dorsally spinulose between two sharp points.

The eye shows no ocellus. The mandibular palp is distinctly three-jointed; one cutting-plate has six, the other five teeth. The widely divergent lobes of the lower lip have little sharp tips. The emarginate palp of the first maxillae is tipped with several setae. The second and third joints of the second maxillipeds are coalesced, with only a small notch in the margin. Other mouth organs agree fairly with those figured by Bate for *C. incertus*. The first peraeopods are very setose, and on the surface of the simple seventh joint have many rows of microscopic spinules. In the second peraeopods the "chelae are, for a *Pandaloid*, large," as Alcock observes,

while for *C. incertus* this point is not noticed. The third peraeopod is longer than the fifth. The larger specimen, a female with eggs, measured 58 mm., the smaller, from which the figures were drawn, was about 40 mm. in length.

*Localities.* Cape Point NE. by E. 6 miles (Cape Colony); depth 80 fathoms. A 1269; and Cape Natal W. by N.  $\frac{3}{4}$  N. 11 miles (Natal); depth 185 fathoms. A 1271.

Two opposite questions suggest themselves, one, whether *C. incertus* may not be a synonym of *C. crassicornis*, the other, whether, if correctly described, they should not be assigned to different genera.

#### FAMILY NEMATOCARCINIDAE.

1888. *Nematocarcinidae*, Bate, Rep. Voy. Challenger, vol. 24, pp. xiii, 809, 927.  
 1914. „ Stebbing, Tr. Roy. Soc. Edinb., vol. 50, pt. 2, p. 296 (with synonymy).

#### GEN. NEMATOCARCINUS, A. Milne-Edwards.

1881. *Nematocarcinus*, A. Milne-Edwards, Ann. Sci. Nat., Zool., Ser. 6, vol. 11, art. 4, p. 14.  
 1914. „ Stebbing, Tr. Roy. Soc. Edinb., vol. 50, pt. 2, p. 297 (with synonymy).  
 1914. „ Balss, Abhandl. K. Bayer. Ak. Wiss., Suppl. vol. 2, pt. 10, p. 22.

This genus is well fitted to excite wonder at the length and tenuity of the flagella in both pairs of antennae and of the three median joints in the last three pairs of peraeopods. Admiration, however, may well be tinged with disappointment when the student finds that, owing to these very characters, all his specimens are mutilated. In the present collection not a single example could be found with the third peraeopod complete, the fourth and fifth pairs offering respectively no more than two and three perfect limbs. Similarly, the more or less elongate rostrum, scarcely ever absolutely uninjured, is often seriously damaged or broken short off at the base. Spence Bate, who uses the length of the rostrum and its denticulation to justify a variety of specific distinctions, in his discussion of *N. productus* practically admits that the criterion is untrustworthy. For two species, *N. undulatipes* and *N. tenuirostris*, Bate gives the character that the finger in the

third and fourth peraeopods (or one of them) is undulated. This would separate the former from *N. cursor*, A. Milne-Edwards, with which Alcock in 1901 suggests its identity. Alcock in the same year refers to the close affinity between Bate's *N. tenuipes* and the same author's *N. tenuirostris*. But in redescribing the latter he makes no mention of undulated fingers, while of *N. tenuipes* Bate expressly says that the fingers are straight. Between his *N. lanceopes* and his *N. longirostris* Bate draws the distinction that in the former the eggs are large and oval, but in the latter small and round. Whether the eggs observed were at the same stage of development he does not state. In this genus the large size of the second joint in the second maxillipeds may be worthy of notice, though much the same character occurs in neighbouring families.

Specimens, differing much in bulk, all from considerable depths, and all from the same area of the South African waters, have been sent from the following stations:—

1. Cape Point N.  $81^{\circ}$  E. 32 miles; depth 460 fathoms. A 1312. No. 180.

2. Cape Point E. by N.  $\frac{3}{4}$  N. 34 miles; depth 480–600 fathoms. A 1242.

3. Cape Point NE.  $\frac{3}{4}$  E. 6 miles; depth 600 fathoms. A 1287.

4. Cape Point Lighthouse N.  $2\frac{3}{4}$  E. 36 miles; depth 600 fathoms. No. 179.

5. Cape Point Lighthouse NE.  $\frac{3}{4}$  E. 36 miles; depth 600 fathoms. No. 200.

6. Cape Point N.  $89^{\circ}$  E. 36 miles; depth 700 fathoms. A 1243.

7. Cape Point NE. by E.  $\frac{1}{2}$  E. 43 miles; depth 900 fathoms. A 1229.

8. Cape Point N.  $58^{\circ}$  E. 49 miles; depth 900 fathoms. A 1290.

A specimen which has come to light from a ninth station must be reserved for discussion at a future opportunity.

#### NEMATOCARCINUS LANCEOPES, Bate.

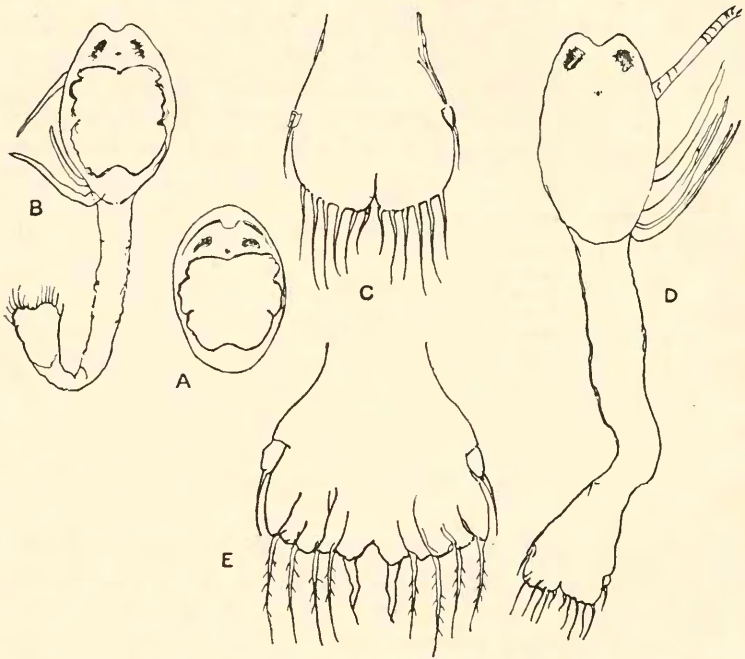
1888. *Nematocarcinus lanceopes*, Bate, Rep. Voy. Challenger, vol. 24, p. 804, pl. 131.

1914.        ,,                ,,        Stebbing, Tr. Roy. Soc. Edinb., vol. 50, pt. 2, p. 298, pl. 32b.

In using the above specific name for the present collection I must confess that it is only adopted after long deliberation as a counsel of despair. Some of the specimens have a length of 7 inches, retaining as preserved and while shielded from light a deep red colour. A specimen from No. 7 in the list of stations given above has the following dimensions: total length 175 mm., of which the carapace with rostrum accounts for 75 mm. and the telson for 21.9 mm. The rostrum from the base of the orbit is nearly 41 mm. long; the dorsal teeth are 30 in number, 7 of them behind the base of the orbit, the foremost 3 widely spaced, ventral teeth 3, widely spaced, the ventral margin as usual setulose. The sixth pleon segment is of the same length as the telson, the fifth pereopod 109 mm. long. The finger of this limb is much shorter than that of the fourth pair, but broader at the base, triangular with a setule at the tip, surrounded as in the preceding pair by long setae finely fringed, some of them more conspicuously armed near the base. Neither in this nor in any other specimen is the third pleon segment dorsally extended into an acute point.

Only two specimens in the collection are carrying ova, each being an example of very large size, with very long rostrum, the length of it conjectural in one case but easily inferred from companion specimens. In each instance the eggs are abundant, not round but decidedly oval, yet curiously differing in size and other respects. Those of the larger pattern are from the smaller depth of 460 fathoms, the smaller from the depth of 600 fathoms (No. 4 in the list). It is interesting to compare these forms with that which Mr. Stanley Kemp has figured and described in 1910 (Fisheries, Ireland, p. 79, pl. 9, figs. 9, 10), extracted from an egg of "*Nematocarcinus ensifer*, var. *exilis*, Spence Bate." Mr. Kemp says: "The chief features of this larva are the long, sharp, downwardly curved rostrum and an obtuse angle in the posterior third of the third abdominal somite. The telson (Fig. 10) is apically emarginate and bears seven pairs of plumose setae. The mandibles, maxillae, and maxillipedes are present, but no pleopods or pereopods are developed." Presumably my figures show an earlier stage of development, as there is a nauplian eye, no rostrum, but on the other hand there appears a small plate tipped with a seta and indicative of the coming uropods (the Figs. A, B, C are from station No. 179, D, E from No. 180. The telson, Fig. C, is more highly magnified than the telson, Fig. E).

Specimens from the third, fifth, and eighth stations are all of comparatively small size and have reddish brown eyes, while in specimens from the other stations, whether large or small, the eyes are black. A specimen from the third station, with the rostrum perfect, shows that arrangement of its denticulation which Bate describes and figures for his Japanese species *N. longirostris*, the dorsal teeth very numerous, to the rear closely packed, but widely separated forward, where they are accompanied by five ventral teeth. This specimen was



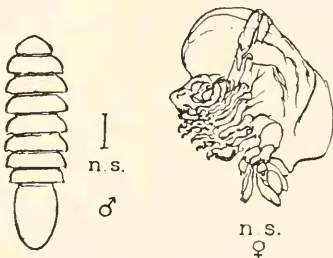
Ovum, and larvae from ova of *Nematocarcinus*, sp.

83 mm. in total length, the carapace 34 mm., inclusive of the rostrum, which measured 18 mm. Another specimen with carapace 30 mm. long has a rostrum 14 mm. in length. This specimen also has five ventral teeth, the dorsal numbering 36. A specimen from the eighth station has a carapace 32 mm. long, of which only 12 mm. belong to the rostrum. The dorsal teeth are 19, the tooth most to the rear being clearly separate from the 8 immediately in advance of it. There are 4 ventral teeth nearly corresponding in position to the

4 anterior dorsal teeth behind the foremost dorsal tooth. The antennal tooth and the antero-lateral tooth of the carapace are acute and conspicuous, but this seems to be a character common to the South African specimens. The telson agrees in length with the rostrum. Another specimen from the same station, measuring 81 mm., has a carapace 28 mm. long, with rostrum 10 mm., dorsal teeth 28, and no ventral teeth.

In the mouth organs of different specimens there do not appear to be variations on which any reliance can be placed for specific discrimination.

The Epicaridean parasite here figured, with a specific name alluding to the genus of its host, was lodged among the anterior pleopods of a large specimen taken at Station A 1229. The parasite itself has the characters of a genus very clearly described by Professor Sars in his Crustacea



*Hemiarthrus nematocarcini*, n. sp.

of Norway (vol. 2) under the preoccupied name *Phryxus*. For this Giard and Bonnier substituted the name *Hemiarthrus*, rather unfortunately as the closely similar name *Hemiarthrum* had already been used. The male of the new species is distinguished from that of *H. abdominalis* (Kröyer) by the very different shape of its oval pleon. On its first extraction from an apparently symmetrical situation the female may well excite surprise by its extremely lop-sided structure, but Sars has explained that "the parasite is always found to be firmly attached by the aid of the one series of legs to the basal part of one of the anterior pleopods of its host, sometimes the right, sometimes the left, and the distortion of the body to the one or the other side depends on this mode of attachment" (Crustacea of Norway, vol. 2, p. 217). Nevertheless, the distortion, which is so adequately explained

when a Bopyrid is lodged in the cheek-piece of a prawn, seems far less natural when its residence is between the pleopods, unless inherited from an ancestry differently located. *Cryptone elongatus*, Hansen, was described in 1897 from the branchial cavity of *Nematocarcinus agassizii*, Faxon, and quite recently Mr. K. H. Barnard has described *Zonophryxus quinquedens*, n. sp., found in company with an unnamed South African species of *Nematocarcinus*.

#### FAMILY ATYIDAE.

1879. *Atyidae*, Kingsley, Pr. Ac. Sci. Philad., p. 414.

#### GEN. CARIDINA, Milne-Edwards.

1837. *Caridina*, Milne-Edwards, Hist. Nat. Crust., vol. 2, p. 362.  
 1910. „ Stebbing, Ann. S. African Mus., vol. 6, pt. 4, p. 393  
 (with synonymy).  
 1912. „ Lenz, Arkiv för Zoologi, vol. 7, No. 29, p. 4.  
 1913. „ Bouvier, Tr. Linn. Soc. London, Ser. 2 Zool., vol. 15,  
 pt. 4, p. 447.

#### CARIDINA NILOTICUS (Roux).

1833. *Pelias niloticus*, Roux, Ann. Sci. Nat., vol. 28, p. 73, pl. 7.  
 1908. *Caridina nilotica*, de Man, Records Indian Mus., vol. 2,  
 pp. 255, 262, 263.  
 1910. „ „ Stebbing, Ann. S. African Mus., vol. 6,  
 pt. 4, p. 394.

To judge by the elaborate researches of Dr. de Man and Professor Bouvier the species of *Caridina* are capable of yielding an endless number of variations. Professor Bouvier has patiently dealt with hundreds, nay, thousands, of specimens. With seven specimens at my disposal from a single locality, it may be interesting to give details as to the rostrum in each. The first examined excited attention by a feature which did not recur in any of the others, namely, by having three dorsal teeth lying closely in succession behind the apex; they were separated by a long smooth interval from the series of 17 dorsal teeth, of which 2 are behind the orbit; 10 ventral teeth form a series beginning some way in front of the eyes and ending in advance of the dorsal row but at some distance from



the apex. The second specimen showed 21 dorsal teeth in series, 1 after a long interval, and still another after a shorter interval lying close to the apex, the first and second dorsal teeth were behind the orbit, the twenty-first just behind the foremost of the 10 ventral teeth. A third specimen bore 17 teeth in dorsal series, 3 of them behind the orbit, a single tooth after a long interval, and after a short interval 1 tooth near the apex; the ventral teeth were 14, the foremost almost under the single dorsal tooth following the long interval. The fourth specimen, a female with eggs, had 16 dorsal teeth, 2 of them behind the orbit, then a very long interval followed by 2 teeth close to the apex, the 14 ventral teeth reaching much beyond the dorsal series, but not nearly to the apex. The fifth specimen, also a female with eggs, had 17 dorsal teeth followed at a long interval by 2 at the apex, which was approached at a shorter interval by the 13 ventral teeth. The sixth specimen, a small one, had 18 dorsal teeth, of which the foremost was slightly more distant from its neighbour than the others and followed at a long interval by 2 at the apex, with 12 ventral teeth also distant from the apex. The seventh specimen differs much from the others, having a series of 6 teeth, 3 of them behind the orbit, followed at a short distance by a series of 3 ending a little in advance of the eyes, all the rest of the rostrum being devoid of teeth, except a minute group below the apex. This is perhaps a monstrosity rather than a variation. The first specimen measured 24.5 mm. in length; the apex of the telson carried 7 long spines, 3 on one side and 4 on the other of the minute central point, flanked by a short pair of lateral spines, a similar pair a little higher up being unsymmetrically placed. That one of the named varieties may claim these specimens for its own is not unlikely.

*Locality.* Vaal River at Parys (Orange Free State). Collected by Mr. H. A. Fry. 1471.

#### FAMILY STYLODACTYLIDAE.

1880. *Stylodactylidae*, Bate, Rep. Voy. Challenger, vol. 24, pp. 481, 850.  
 1902. „ de Man, Abhandl. Senckenb. Naturforsch. Gesells., vol. 25, p. 897.

1906. *Stylodactylidae*, Rathbun, Bull. U.S. Fish Comm. for 1903,  
pt. 3, p. 927.
1907. „ Borradaile, Ann. Nat. Hist., Ser. 7, vol. 19,  
p. 466; *Stylodactyloida*, pp. 467, 471.
1914. „ Balss, Abhandl. K. Bayer, Ak. Wiss., Suppl.  
vol. 2, pt. 10, p. 26.

In this family remarkable characters are furnished by the second maxillipeds and the first two pairs of peraeopods. According to Bate the second maxilliped "terminates in two branches, subequal in size and importance," though his figure qualifies the subequality by showing one branch nearly twice as long as the other. From his specific descriptions it is evident that he regarded both branches as representing the seventh joint. Borradaile takes a different view, assigning to this family "second maxillipeds with the sixth and seventh joints articulating separately on fifth." Against this explanation it may be urged that the short curved joint which follows the long third joint has the appearance of being actually representative of the fifth joint. Bate speaks of it as "analogous to the carpos." But if the third joint be in reality composite, ischium and merus in one, the following joint will be the true fifth. Whatever their numerical position, the two terminal branches are very anomalous. Dr. Calman has suggested to me that the smaller branch may be a process of the sixth joint which has become movable, like the thumb of the first peraeopod in the genus *Psolidopus*, Wood-Mason. In the first and second peraeopod the palm has dwindled to the shortest span, and the long slender setose fingers lie so closely one upon the other that the ordinary function of chelae as grasping organs seems almost out of the question.

GEN. *STYLODACTYLUS*, A. Milne-Edwards.

1881. *Stylodactylus*, A. M.-Edwards, Ann. Sci. Nat., Ser. 6, vol. 11,  
art. 4, p. 11.
1888. „ Bate, Rep. Voy. Challenger, vol. 24, pp. 481,  
850.

Milne-Edwards established the genus for a single species, *S. serratus*, though giving precedence in 1883 to another species, *S. rectirostris*, on Plate 35 of his "Recueil de Figures de Crustacés Nouveaux ou peu connus," *S. serratus* being

figured on the following, Plate 35a. Bate in 1888 added *S. discissipes*, *S. orientalis*, and *S. bimaxillaris*, in the first and third directing attention by the specific names to the most notable characters of the family. The grounds assigned for separating *S. orientalis* from *S. discissipes* can scarcely be accepted as adequate. In 1902 de Man describes a very young specimen, related to *S. bimaxillaris*, under the provisional name of *S. amarynthis*. There are thus six nominal species in the genus, if we include *S. rectirostris*, which has been overlooked since its institution. The figures very clearly differentiate it from *S. serratus*. The rostrum shows 37 teeth above and 7 below in addition to a tooth close to the base; the first peraeopod has the wrist or fifth joint longer than that of the second peraeopod, and the telson is only about twice as long as broad, with a blunt apex. In *S. serratus* the rostrum shows 36 teeth above, 27 below, without tooth close to the base; the second peraeopods decidedly longer than the first, the wrist and fingers contributing to this superiority in a marked degree; the telson more than thrice as long as broad, with apex acute.

STYLODACTYLUS SERRATUS, A. Milne-Edwards.

Plate LXXVI.

1881. *Styloactylus serratus*, A. Milne-Edwards, Ann. Sci. Nat.,  
Ser. 6, vol. 11, art. 4, p. 11.  
1883.       "               "       A. Milne-Edwards, Recueil figs. Crust.  
                                  Nouv., pl. 35a.  
1888.       "               "       Bate, Rep. Voy. Challenger, vol. 24,  
                                  p. 853.

The South African specimens appear essentially to agree with the descriptions and figures given by A. Milne-Edwards, except that the wrist of the second peraeopods does not differ in length from that of the first pair, although the fingers are much longer. These fingers are quite straight, strongly setose, the apex not acute. In the preserved condition they are resilient, upon separation springing back into position, one overlapping the other so as to look like a single joint. On these limbs and some other parts the long setae, instead of being finely and continuously plumose, have spicules discontinuously projecting at various angles on different lines.

A specimen with rostrum and telson practically complete measured 52 mm., rostrum 13 mm., carapace with rostrum 23 mm., pleon 29 mm., of which the telson accounted for 7 mm. Here the upper carina carried 34 teeth and the lower margin of the rostrum 17. The length of the telson is more than thrice its greatest breadth; dorsally there is a small group of setae near the base; 6 pairs of spines are spaced to the place whence the sides abruptly converge to form a pointed apex flanked by a short pair of spines, with a longer pair outside them, one of the pair in our specimen abnormally shorter than the other.

The eyes are of moderate size, as preserved reddish brown, with the pigment broken up into irregular compartments. In Milne-Edwards' account the eyes are small, but he adds that they are in contact on the median line, which would imply some tumidity. To the first antennae he attributes a little pointed scale, but his figure shows that this stylocerite, as Bate calls it, is at least as long as the joint of which it forms a part; the flagella are very unequal. The scale of the second antennae has the smooth margin somewhat concave, with the distal tooth reaching beyond the narrowed apical margin.

As the figures show, the denticulation of the mandibles is not absolutely identical in the two members of the pair or in different specimens of the same species. According to Bate the palp or outer branch of the first maxillae is bifid at the extremity; in our species the extremity is only faintly emarginate, with a strong seta at the inner corner, three slighter setae at the outer, and a curved surface spine below the apex. The vibratory apparatus of the second maxillae carries very long setae on the lower end which is narrower than the upper. The second maxillipeds have the terminal joints as represented by Milne-Edwards, the longer but narrower plate attached near the inner margin of the preceding joint, but partly overlapping the attachment of the shorter and broader plate; both are beset with masses of curved plumose setae alike from their own margins and surfaces and from the preceding joint, which contains muscles directed to each of the plates. Third peraeopods stouter than fourth or fifth, fingers small, with dentate inner margin.

The outer branch of the uropods has a sinuous diaeresis

leading to a tooth on the outer margin, this tooth partially overlapping a stout spine.

The specimen figured is an ovigerous female, measuring by allowance for the imperfect rostrum about 3 inches or 75 mm.

*Locality.* Buffalo River NW.  $\frac{1}{2}$  W. 19 miles (East London, Cape Colony); depth 300 fathoms. A 1284.

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Gennadas .....	12		
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gracilipes (Chlorotocus) .....	42		
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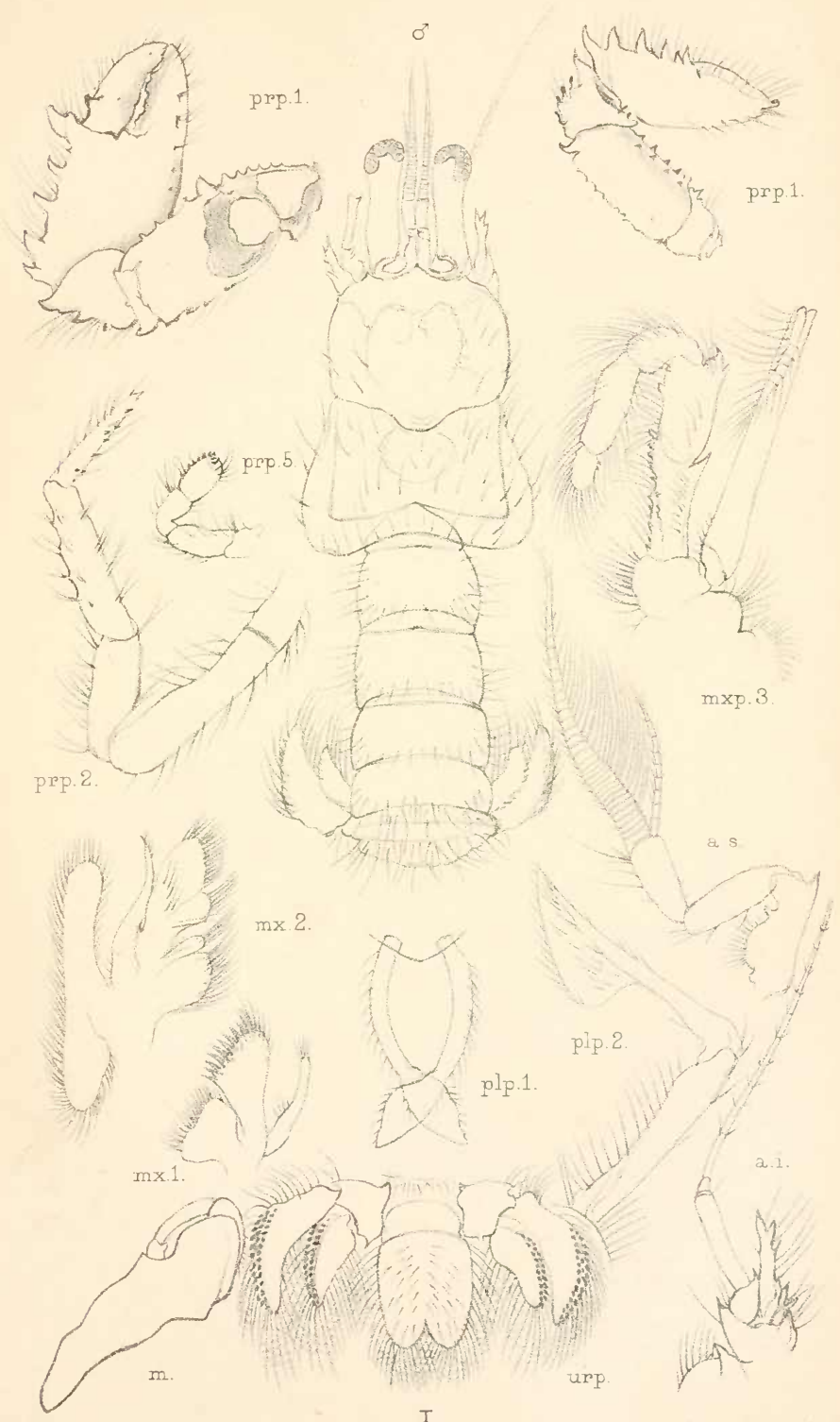
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PLATE I. (Crustacea, Plate LXV.)

*Pomatocheles balssi*, n. sp.

- ♂. Dorsal view of male specimen magnified, the telson folded out of sight.
- T., urp. Dorsal view of telson and uropods. This figure and the peraeopods on the same scale as the full figure, the rest more highly magnified.
- a.s., a.i. The first and second antennae, flagellum of the second incomplete.
- m., mx. 1, mx. 2, mxp. 3. Mandible, first and second maxillae, and third maxilliped.
- prp. 1, 1, 2, 5. Both members of the first pair in their relative positions, but the inner side of the large left cheliped is shown and the outer of the smaller right-hand one. The peraeopod marked prp. 2 is open to a little doubt, as, besides being detached, it was the only one present of the three intermediate peraeopods, and may therefore be the third; the fifth peraeopod was in position when received.
- plp. 1, 2. The first pair of pleopods and one member of the second pair.





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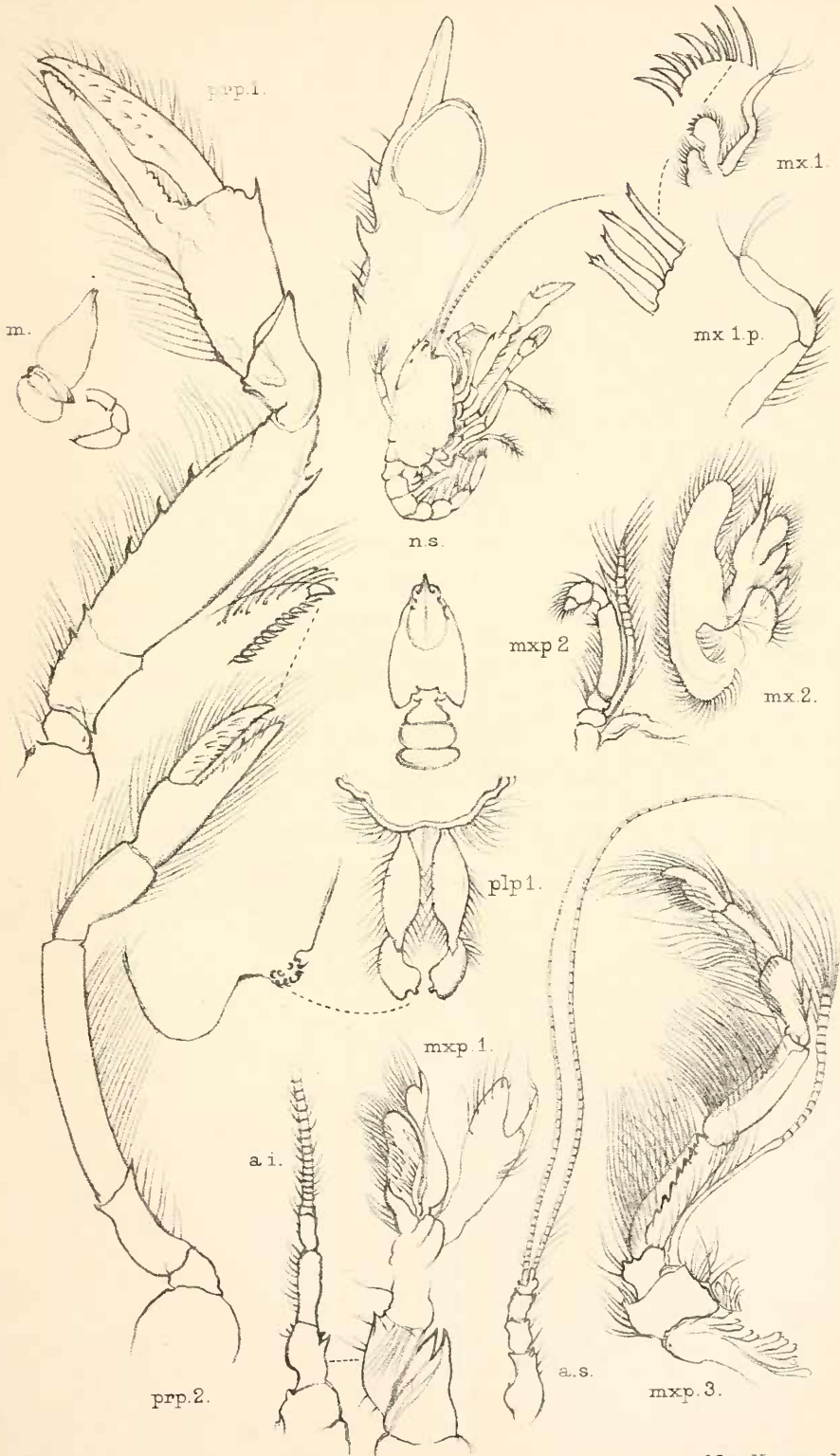
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POMATOCHÉLES BALSSI n. sp.

PLATE II. (Crustacea, Plate LXVI.)

*Calocaris barnardi*, n. sp.

- n.s. A specimen in lateral view, natural size, and the same without appendages in dorsal view below; the rostrum and eye in lateral view above, magnified.
- a.s., a.i. The first and second antennae; only a small portion of the flagellum of the latter shown, the antepenultimate joint of its peduncle more highly magnified.
- m., mx. 1, mx. 1 p., mx. 2. Mandible, with palp detached, first maxilla, with higher magnification of spines, palp of the other mx. 1 more highly magnified; second maxilla on a higher scale of magnification.
- mxp. 1, 2, 3. First, second, and third maxillipeds.
- pp. 1, 2. First and second pereopods, with higher magnification of the apex of the movable finger of the second.
- plp. 1. The first pair of pleopods, with apex more highly magnified.



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CALOCARIS BARNARDI, n.sp.

PLATE III. (Crustacea, Plate LXVII.)

*Penaeus pulchricaudatus*, n. sp.

car. Carapace in lateral view.

T. Telson in dorsal view, with much higher enlargement of the distal portion.

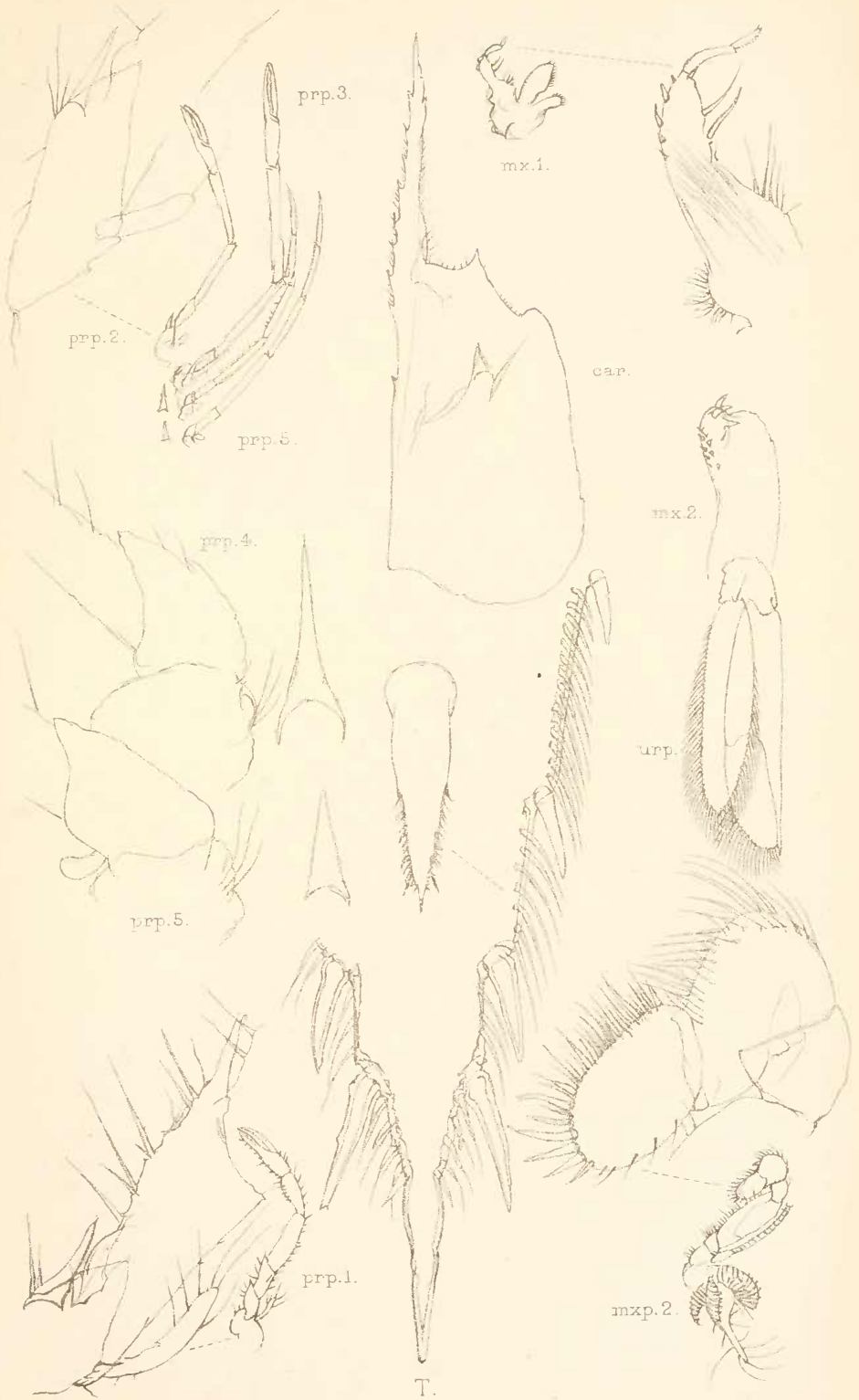
mx. 1. First maxilla with terminal joints much more enlarged.

mx. 2. Only the apical plate of the second maxilla, on the higher scale.

mxp. 2. The second maxilliped, with higher enlargement of the three distal joints.

prps. 1-5. The five pereopods, the first with higher enlargement of the second and third joints and the exopod; the second with further enlargement of second joint and exopod; basal joints of fourth and fifth on the higher scale, with the adjoining ventral processes.

urp. One of the uropods.



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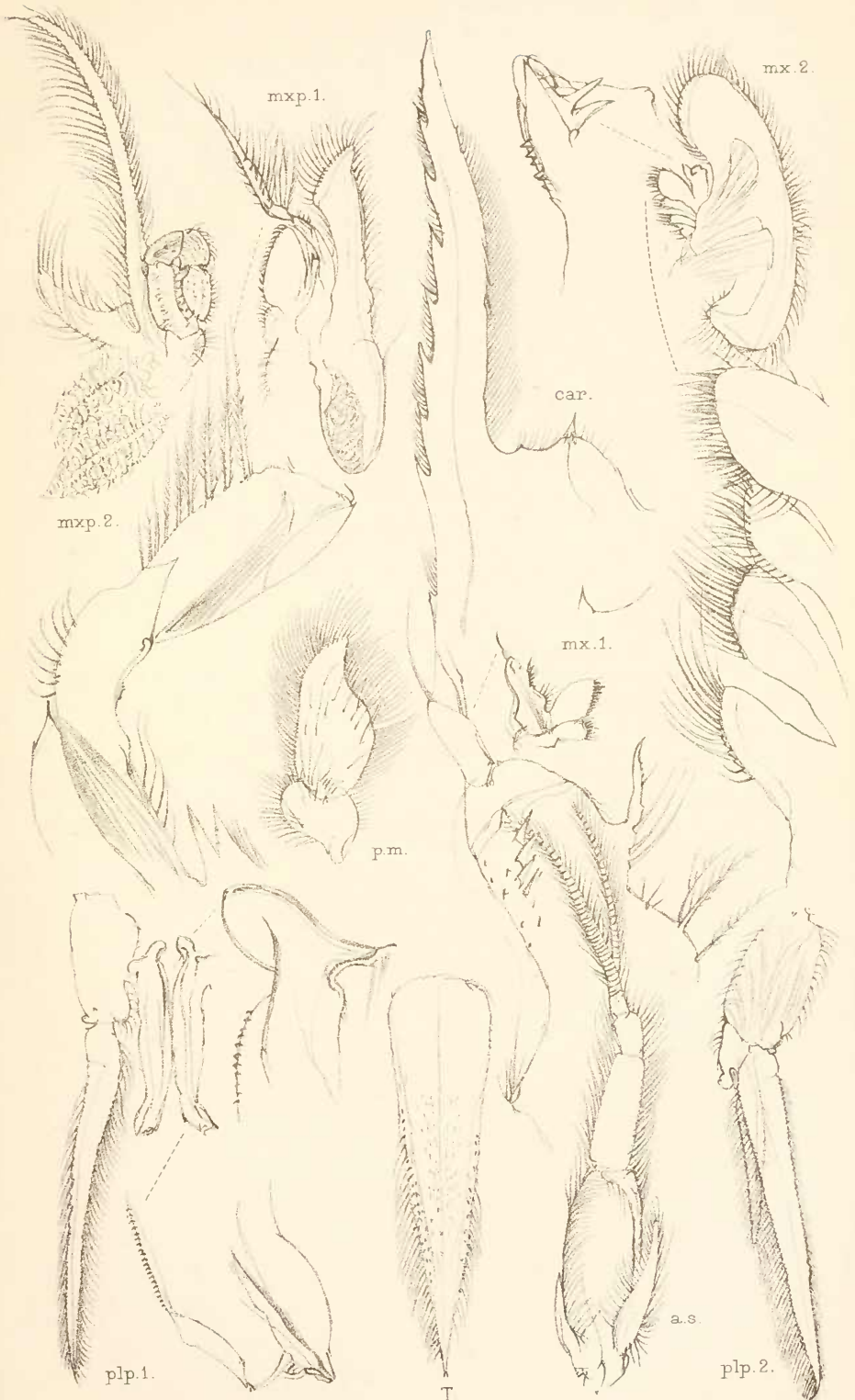
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PLATE IV. (Crustacea, Plate LXVIII.)

*Penaeopsis spinulicauda*, n. sp.

- car. Part of carapace in lateral view.
- T. Telson in dorsal view.
- a.s. First antenna.
- p.m. Palp of mandible.
- mx. 1. First maxilla, with much higher magnification of terminal joints (the palp).
- mx. 2. Second maxilla, with much higher magnification of the lobes and terminal joint.
- mxp. 1. First maxilliped, with much higher magnification of intermediate joints of the endopod.
- mxp. 2. Second maxilliped.
- plp. 1. First pleopod with the petasma, with much higher magnification of the proximal and distal ends of one of its members.
- plp. 2. Second pleopod.

The various parts are drawn to a uniform scale, with the higher magnifications also uniform.



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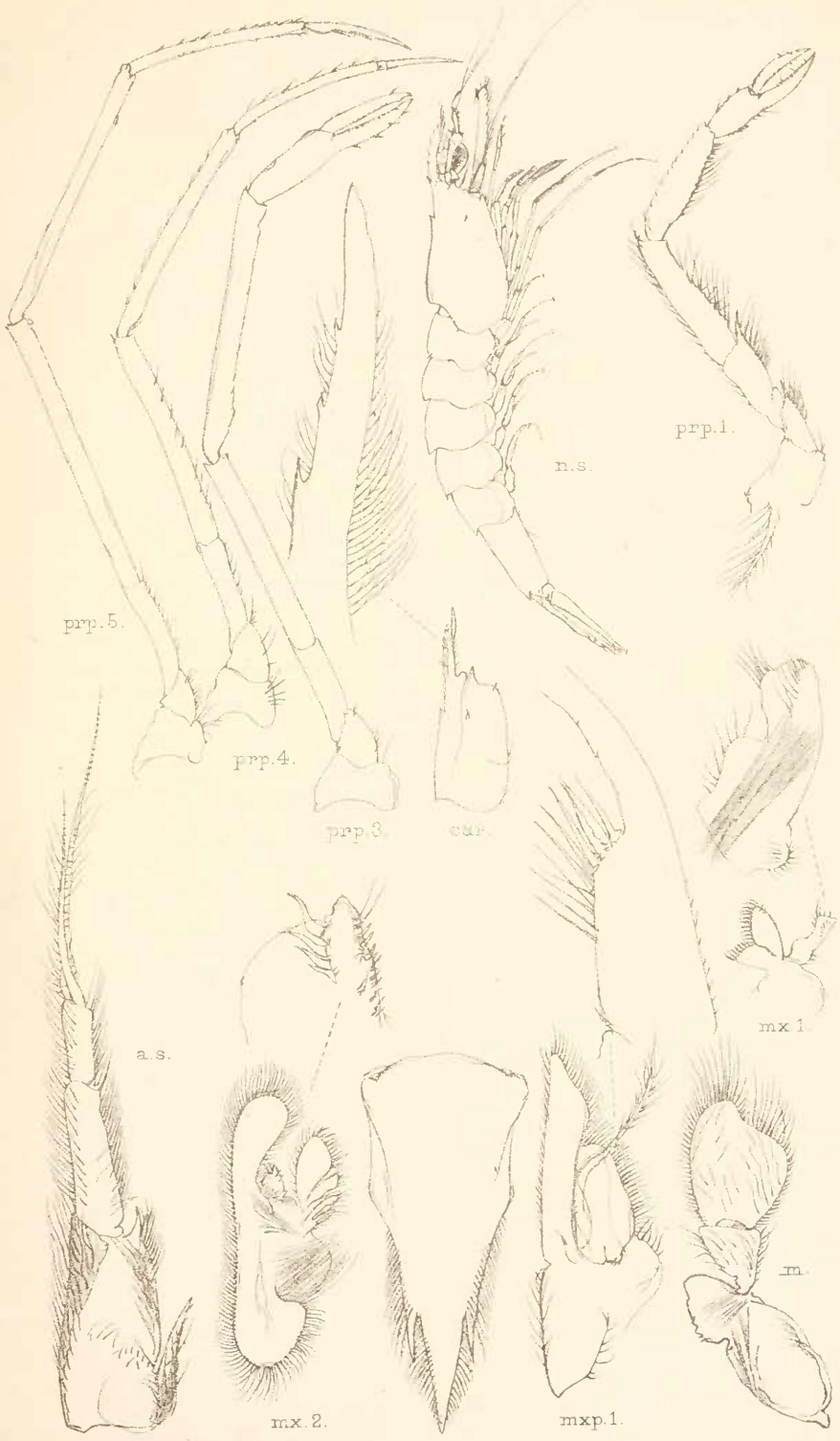
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PLATE V. (Crustacea, Plate LXIX.)

*Parapenaeus fissurus* (Bate).

- n.s. Specimen in lateral view, natural size, flagellum of second antennae imperfect.
- car. Carapace of a smaller specimen detached, to show more clearly the teeth and the fissures, with higher magnification of distal portion of the rostrum.
- T. The telson much enlarged.
- a.s. First antenna.
- m., mx. 1, mx. 2, mxp. Mandibles, first and second maxillae, first maxilliped, with higher magnification of the palp or apical joint of the first maxilla, and still higher of the apex in the second maxilla and the base of the flagellar portion of the first maxilliped.





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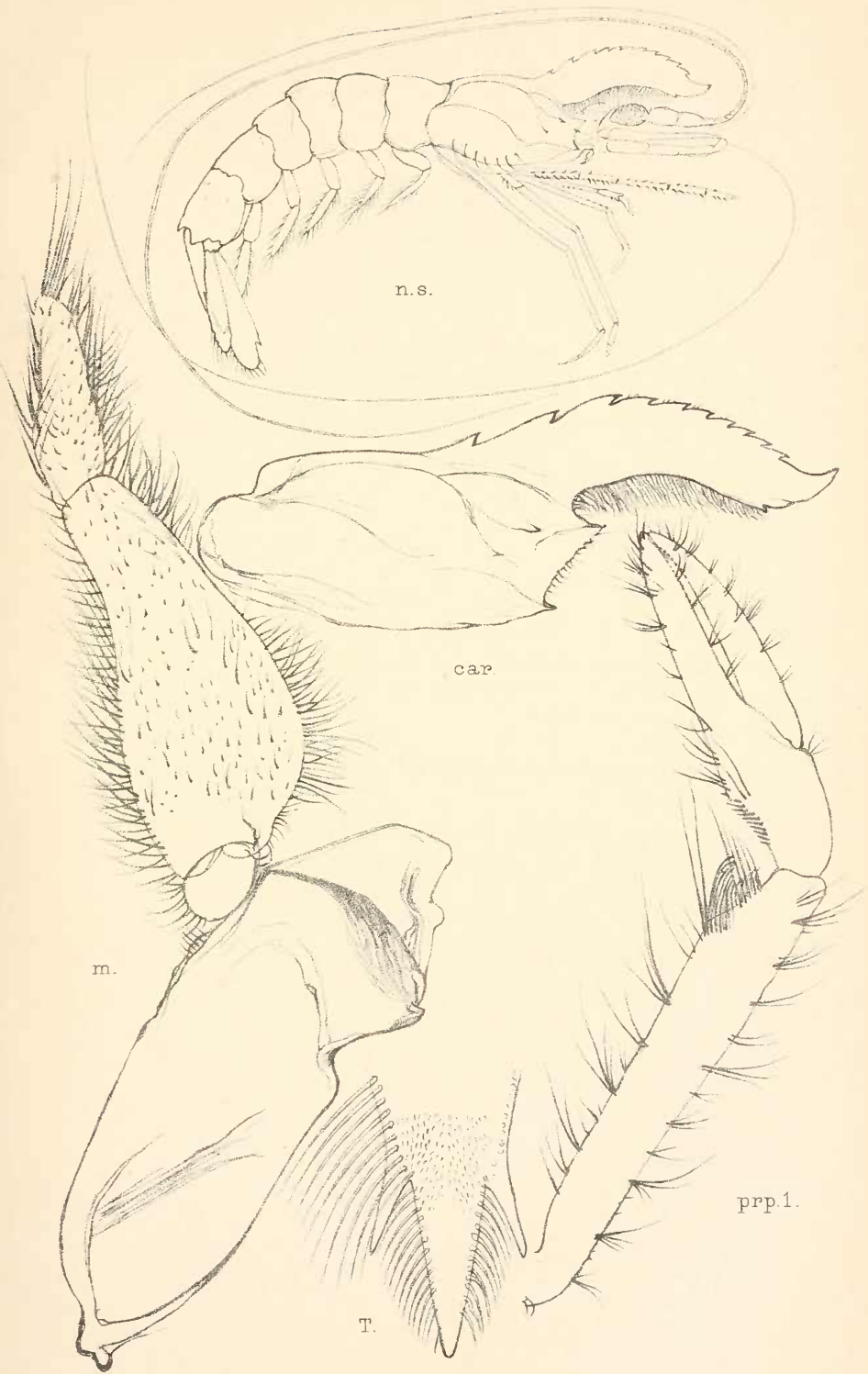
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PARAPENÆUS FISSURUS (Bate)

PLATE VI. (Crustacea, Plate LXX.)

*Haliporoides triarthrus*, n. g. et sp.

- n.s. Lateral view of specimen figured above, natural size.
- car. Much enlarged view of the carapace.
- T. Apical part of the telson.
- m. Mandible.
- prp. 1. Wrist and chela of first peraeopod.



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*HALIPOROIDES TRIARTHURUS n. gen. sp.*

PLATE VII. (Crustacea, Plate LXXI.)

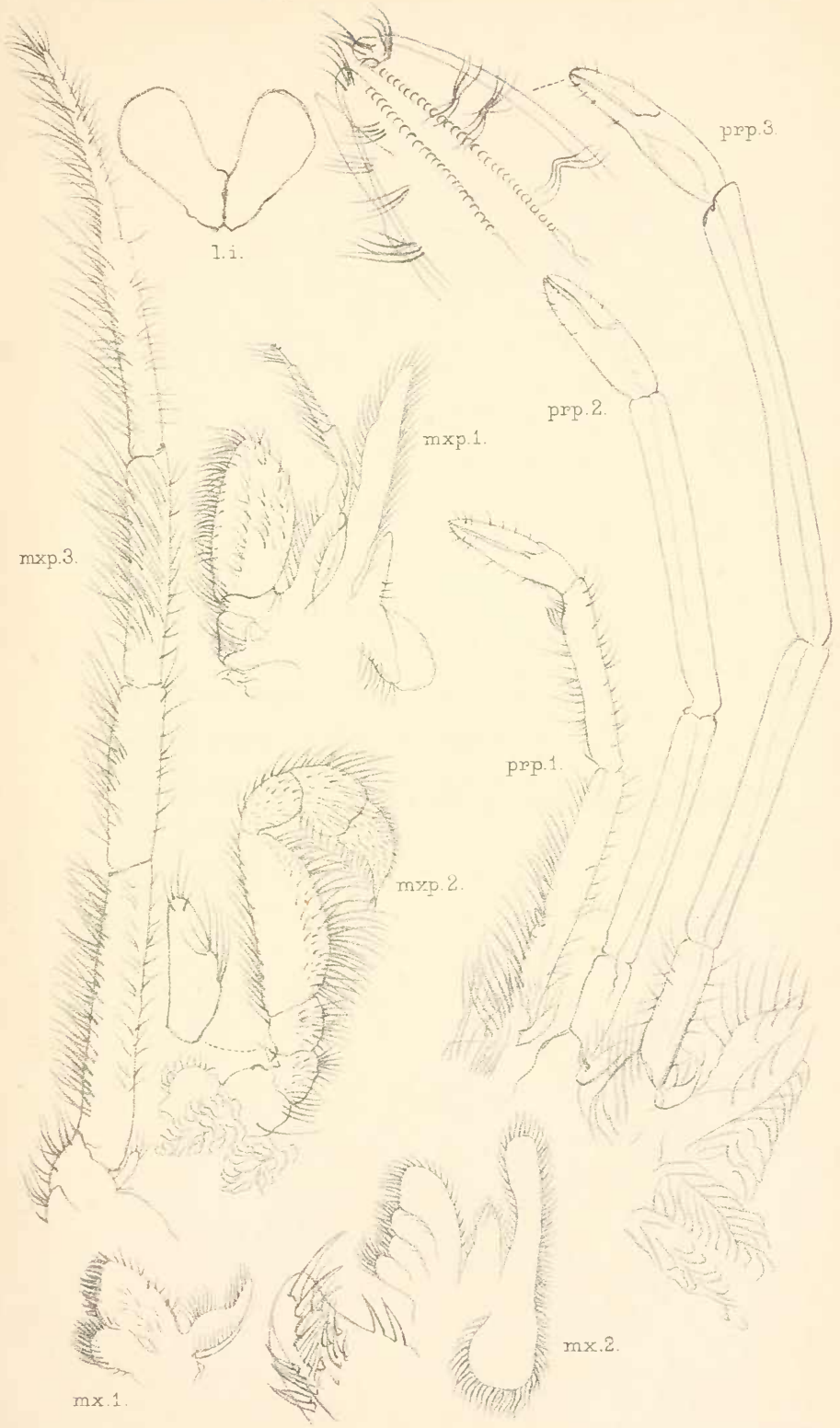
*Haliporoïdes triarthrus*, n. g. et sp.

l.i. Lower lip.

mx. 1, mx. 2. First and second maxillae, with higher magnification of the apex of the endopod of the second.

mxp. 1, 2, 3. First, second, and third maxillipeds, with exopod of the second more highly magnified.

prp. 1, 2, 3. First, second, and third pereopods, with apices of the fingers of the third pair more highly magnified.



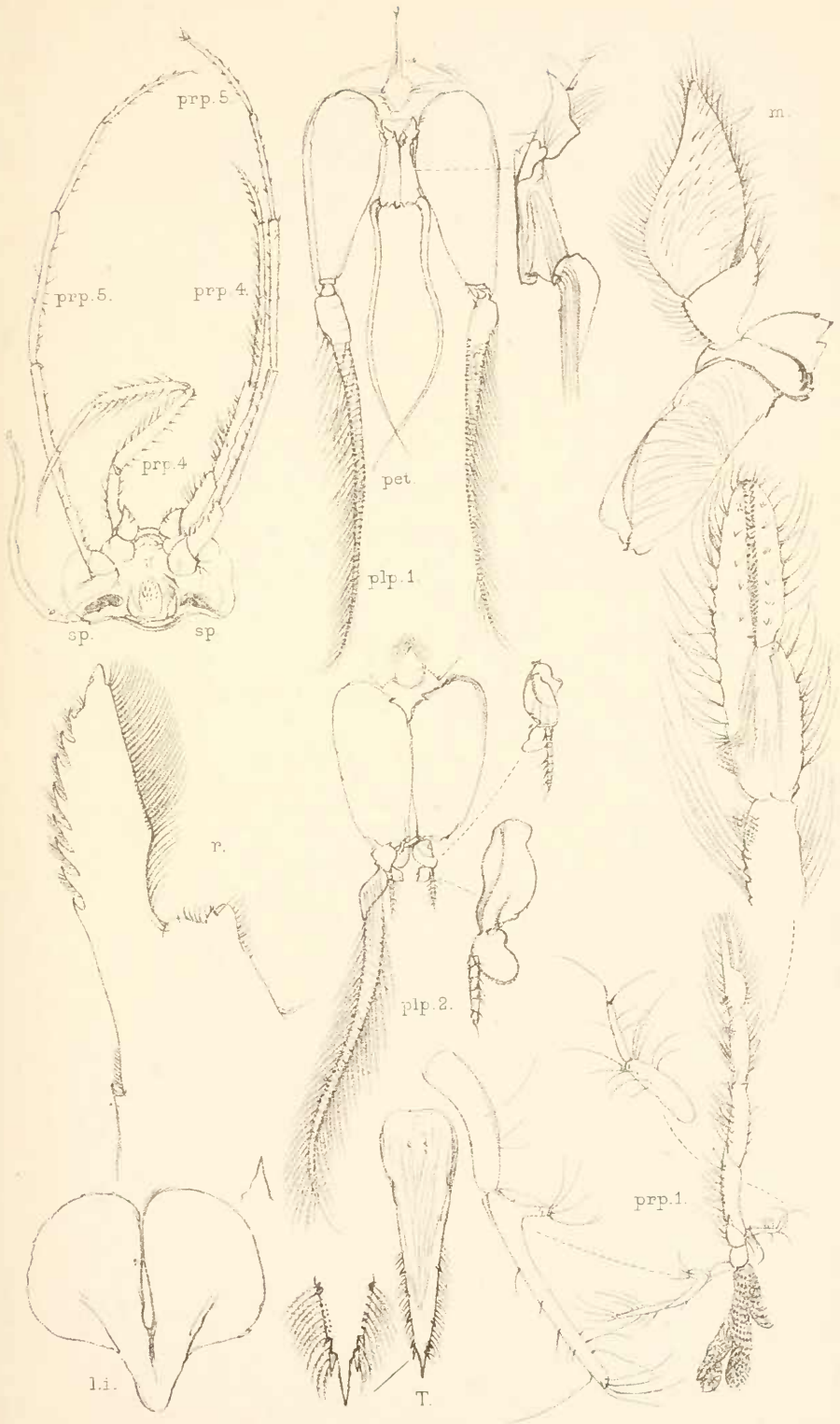
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PLATE VIII. (Crustacea, Plate LXXII.)

*Macropetasma africanus* (Balss).

- r. Rostrum and part of carapace.
- T. Telson, with apex more highly magnified.
- m., l.c. Mandible and lower lip.
- prp. 1. First peraeopod, with higher magnification of the epipod, the exopod, chela and part of fifth joint.
- prp. 4, prp. 5, sp., sp. Fourth peraeopods, one of the pair in its partially folded position, and fifth peraeopods with spermatophores.
- plp. 1, plp. 2, pet. First pair of pleopods with the petasma, part of which is more highly magnified, and second pleopods, omitting the outer ramus of one member, the vestigial ramus more and more highly magnified.



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PLATE IX. (Crustacea, Plate LXXIII.)

*Eusicyonia longicauda* (Rathbun).

car. Carapace in lateral view, incomplete.

T. Telson in dorsal view.

a.s., a.i. First antenna and scale of second.

m., m.p., m. Mandible with the palp detached, the other mandible with its palp oblique.

l.i. Lower lip.

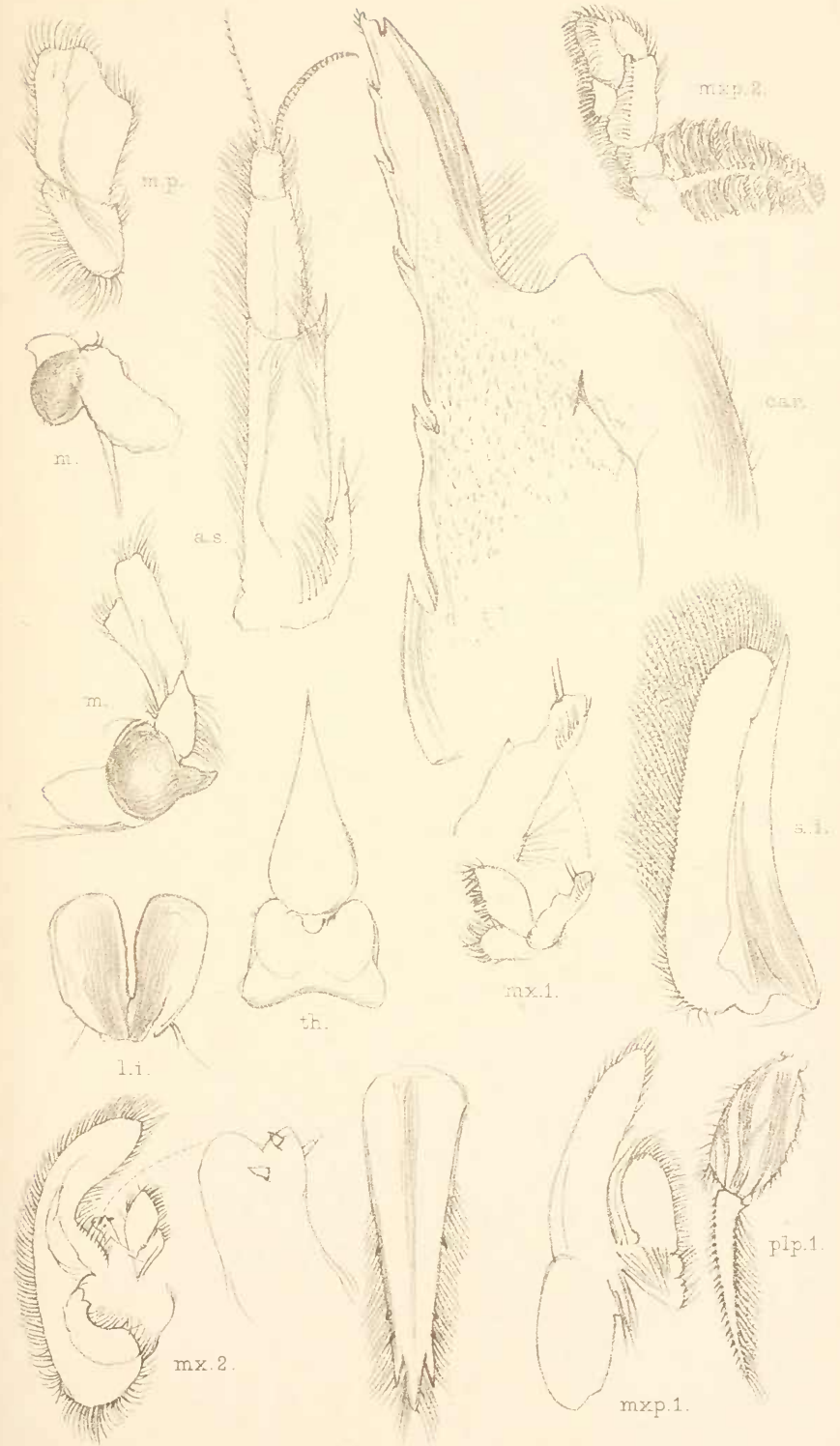
mx. 1, mx. 2. First and second maxillae, the first incomplete, each with the apical plate more highly magnified.

mxp. 1, mxp. 2. First and second maxillipeds.

th. Thelycum.

plp. 1. First pleopod.





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T.

West, Newman lith.

*EUSICYONIA LONGICAUDA* (Rathbun)

PLATE X. (Crustacea, Plate LXXIV.)

*Sclerocrangon bellmarleyi*, n. sp.

n.s. ♀. Lateral view of a female specimen, natural size.

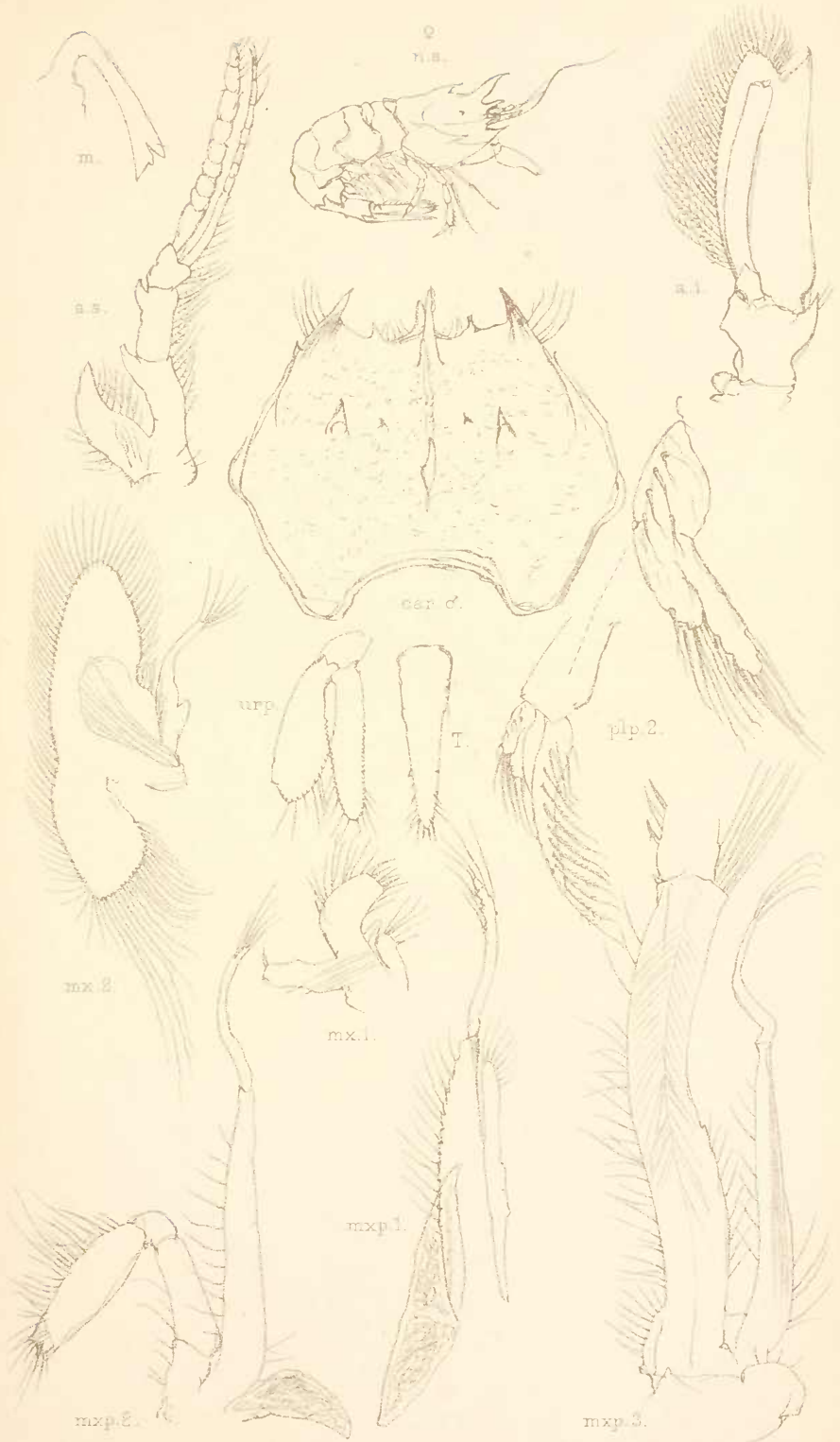
car. ♂, urp., T. Carapace of male specimen, flattened out; one of the uropods, and the telson in dorsal view; these figures to the same scale, less highly magnified than the following, but all alike taken from the male specimen.

a.s., a.i. The first and second antennae, the flagellum of the second missing.

m., mx. 1, mx. 2, mxp. 1, mxp. 2. Mandible, first and second maxillae, and first and second maxillipeds.

mxp. 3. Third maxilliped, ending with base of the penultimate joint.

plp. 2. Second pleopod, with still higher magnification of the inner branch.



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SCLEROCRANGON BELLMARLEYI n. sp.

PLATE XI. (Crustacea, Plate LXXV.)

*Chlorotocus crassicornis*, A. Costa.

car. Part of carapace in lateral view.

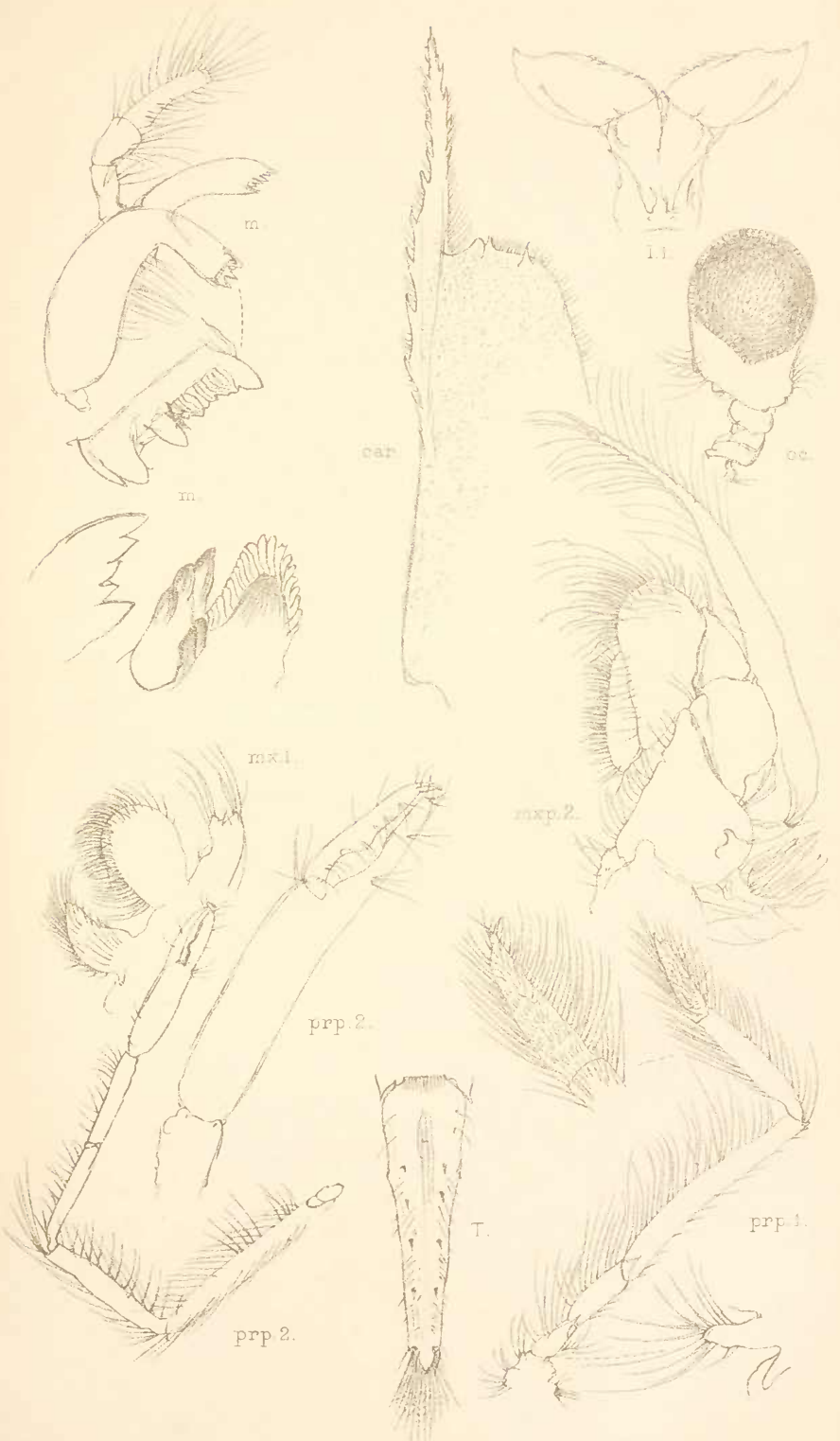
T. Telson in dorsal view.

oc. One of the eyes.

m., m. One mandible complete, with higher magnification of its molar's apical border, the same magnification being used for the cutting edge and molar apex of the other mandible.

l.i., mx. 1, mxp. 2. Lower lip, first maxilla and second maxilliped on the same scale as the whole mandible.

prp. 1, prp. 2. First and second peraeopods, on the same scale as the telson, parts more highly magnified, on the same scale as the whole mandible.



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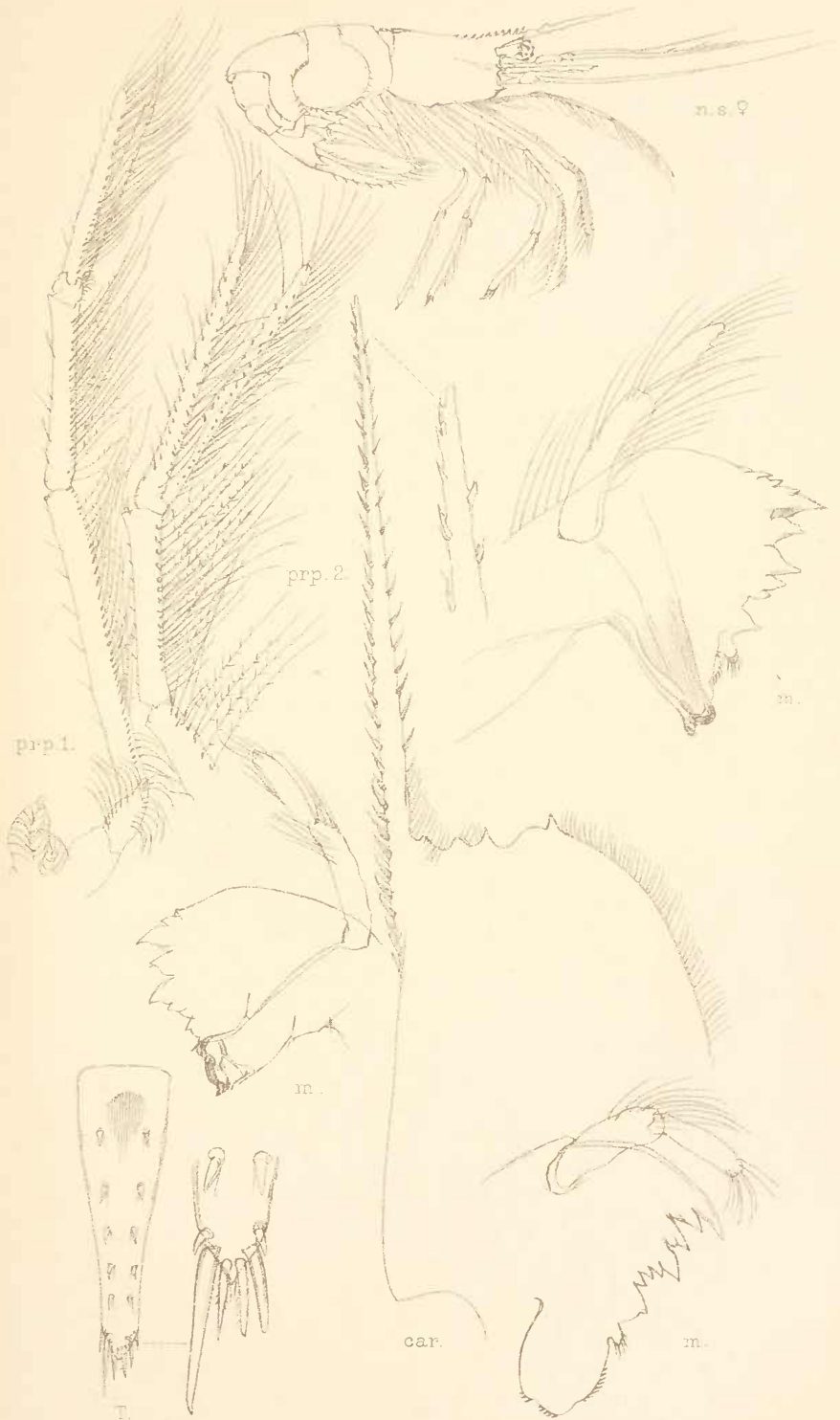
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CHLOROTOCUS CRASSICORNIS (A. Coetz.)

PLATE XII. (Crustacea, Plate LXXVI.)

*Stylodactylus serratus*, A. Milne-Edwards.

- n.3. ♀. Lateral view of female specimen, natural size, rostrum imperfect.
- car. Carapace of a smaller specimen, magnified; tip of the rostrum still more enlarged.
- T. Dorsal view of telson from the smaller specimen, with distal portion more enlarged; the fellow to the long spine on the left is imperfectly developed.
- m., m., m. Mandibles, the uppermost figure from the female specimen, the other two from the smaller specimen.
- pp. 1, pp. 2. The first peracopod and distal part of the second, from the female specimen.



Del. T.R.R. Stebbing.

West Newman lith.

STYLODACTYLUS SERRATUS A. Milne-Edwards.