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Mary J. Fitzhugh

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W. T. Calman

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Fisheries and Marine Biological Survey.
Report No. 4. For the Year 1925.

SPECIAL REPORTS :

No. III. On Macrurous Decapod Crustacea collected in
South African Waters by the S.S. "Pickle,"
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ON MACRUROUS DECAPOD CRUSTACEA
COLLECTED IN SOUTH AFRICAN WATERS
BY THE S.S. "PICKLE."

BY

W. T. CALMAN, D.Sc., F.R.S.

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WITH A NOTE ON SPECIMENS OF THE GENUS
SERGESTES,

BY

Dr. H. J. HANSEN, Copenhagen.

This report deals with the Macrurous Crustacea obtained by the Fisheries and Marine Biological Survey in the years 1920 and 1921. Dr. H. J. Hansen, of Copenhagen, has been good enough to examine the Sergestidæ, of which there are five species, and his report on these is given separately below. Of the other families of Macrura, thirty-one species are enumerated, two of which are described as new, while thirteen others do not appear to have been recorded hitherto from South African waters.

Among the more interesting points dealt with below, attention may be specially called to the number of closely allied species of the genus *Gennadas* which are distinguished by striking characters of the male petasma; to the specimens of the rare *Funchalia woodwardi*, which greatly exceed in size any of those recorded since the type specimen was described sixty years ago; and to the new evidence in support of the view that the species of *Eryoneicus* are young stages of other genera of Eryonidæ.

Full particulars as to the localities where the specimens were obtained will be found in the lists of stations given by Dr. Gilchrist in the first and second reports of the Fisheries and Marine Biological Survey. It has not been thought necessary to repeat these particulars here, and only the indication "off Cape" or "off Natal" with the station-number and depth are given under each species.

No attempt is made to discuss the geographical relations of the species now recorded; but it is hoped that the advances that have been made towards a more accurate determination of the species may prove of use in future faunistic work.

A set of the specimens, including syntypes of the new species, has been presented to the British Museum (Natural History).

I am much indebted to Dr. Gilchrist for the opportunity of examining this very interesting collection.

LIST OF SPECIES.*

Penæidea.

- **Gennadas scutatus*, Bouvier.
- **Gennadas kempii*, Stebbing.
- **Gennadas capensis*, sp.n.
- **Gennadas gilchristi*, sp.n.
- **Gennadas intermedius*, Spence Bate.
- Aristæomorpha foliacea* (Risso).
- Haliporus triarthrus* (Stebbing).
- Solenocera*, sp.
- **Funchalia woodwardi*, Johnson.
- Penæopsis monoceros* (Fabr).
- **Penæopsis philippii* (Spence Bate).
- Penæus semisulcatus*, de Haan.

Caridea.

- Acanthephyra purpurea*, A. Milne-Edwards.
- **Acanthephyra debilis*, A. Milne-Edwards.
- **Acanthephyra stylostratis* (Spence Bate).
- **Hymenodora glacialis* (Buchholz).
- Nematocarcinus lanceopes*, Spence Bate.
- Stylodactylus bimaxillaris*, Spence Bate.
- Chlorotocus crassicornis* (A. Costa).
- Plesionika martia* (A. Milne-Edwards).
- Merhippolyte agulhasensis*, Spence Bate.
- **Ægeon lacazei* (Gourret).

Eryonidea.

- Polycheles demani*, Stebbing.
- **Polycheles typhlops*, Heller.
- Stereomastis sculpta* (S. I. Smith).
- (with *Eryoneicus faxoni*).
- Stereomastis nana* (S. I. Smith).
- **Stereomastis suhmi* (Spence Bate).
- (with *Eryoneicus*, sp.).

Scyllaridea.

- Panulirus bürgeri* (de Haan).
- Palinurus gilchristi*, Stebbing.

Nephropsidea.

- **Nephropsis stewarti*, Wood-Mason.
- **Nephrops andamanicus*, Wood-Mason.

* An asterisk indicates that the species is recorded for the first time from South African waters.

Genus GENNADAS, *Spence Bate*.

The collection includes a large number of specimens belonging to the genus *Gennadas* (including *Amalopenæus*) from the deeper parts of the Cape seas. The adult males are easily sorted, by the form of the petasma, into five species, two of which appear to be undescribed. One species, identified as *G. intermedius*, Bate, has podobranchs on the first three peræopods and therefore belongs to the genus *Gennadas*, s.str.; the other four, lacking these podobranchs, would fall into the genus, or subgenus, *Amalopenæus*, and resemble each other very closely in all characters except those of the petasma. Whether these are natural groups or not, there can be no question that they are very inconvenient in practice; the difficulty of seeing the podobranchs on the presence or absence of which the separation depends is well shown in the case of *G. scutatus* discussed below. The close resemblance, as regards the petasma, between *Gennadas calmani*, *G. kempi* and *G. capensis*, of which the first is a true *Gennadas* while the other two show the characters of *Amalopenæus*, suggests that the podobranchs may not be of very great systematic importance; it is obviously desirable, nevertheless, that their presence or absence should be ascertained in every case, were it only to provide a specific character in a group where specific characters are few and hard to find. While not attempting to decide the question, I keep all the species, for the present, under the name *Gennadas*.*

In addition to the adult males, there are in the collection a number of females and of immature or damaged specimens which I have not ventured to identify. Among the females there are at least two different types of thelycum (one resembling in general form that figured by Kemp for *Gennadas calmani*), but no other characters of importance could be found for separating the specimens into specific groups, or for associating them with one or other of the males in company with which they were caught. Since the characters of the thelycum are often difficult to make out and there is some reason to suppose that they may undergo considerable changes in individuals of the same species, it does not seem that any useful purpose would be served by attempting a fuller description of the specimens I have examined.

It should be mentioned that, while three out of the five species identified occurred at more than one station, all of them were found, together with the majority of the undetermined specimens, at Station 87, where, at a depth of 1,014 fathoms, the closing net was towed, according to Dr. Gilchrist's station list, "just clear of the bottom."

* Sund's use of the name *Amalopenæus* for the combined genera is, of course, indefensible.

GENNADAS SCUTATUS, *Bouvier*.

G. scutatus, Bouvier, C.R. Acad. Sci. Paris, CXLII, p. 748, 1906; *id.*, Bull. Mus. Oceanogr. Monaco, LXXX, p. 9, figs. 8 and 13, 1906; *id.*, Res. Camp. Sci. Monaco, XXXIII, Pénéides, p. 42, pl. viii, 1908; Milne-Edwards and Bouvier, Mem. Mus. Comp. Zool. Harvard, XXVII, No. 3, p. 193, figs. 10-12, 1909; Kemp, Proc. Zool. Soc. p. 727, pl. lxxv, fig. 2, 1909; *id.*, Rec. Ind. Mus., V, p. 178, pl. xiii, figs. 9 and 10, 1910; (with subsp. *indicus*) *id.*, Trans. Linn. Soc. (2) Zool., XVI, p. 61, 1913; Lenz and Strunck, Deutsche Südpolar Exped. XV (Zool. vii), p. 310, 1914.

Occurrence.—Station 87, off Cape, 1,014 fath., closing net, 1 ♂.

Remarks.—The single specimen measures 22 mm. in total length and agrees, in general, with the characters given for this species by the authors quoted above; in particular, the petasma resembles very closely the figure given by Bouvier in 1906. The chela of the third peræopods is just half as long as the carpus. The merus of the same appendages is a little shorter than the carpus, and I find the same to be the case in the "Challenger" specimen described by Kemp in 1909. It would seem, therefore, that the proportion between these segments is less constant than is assumed by Bouvier, who bases on it the first division of his key to the species of *Gennadas* and assigns *G. scutatus* to the group in which the merus is as long as or longer than the carpus.

Kemp states (P.Z.S., p. 728, 1909) that "The presence of podobranchs on the first three pairs of pereopods indicates that this form . . . is a true *Gennadas*." Bouvier, in 1922 (Res. Camp. Sci. Monaco, LXII, p. 9) confirms this: "Le *G. scutatus*, Bouvier, appartient également au même genre" [sc. *Gennadas*]. In face of these explicit statements I should hesitate to record my own failure to find the gills in question if it were not that I have had an opportunity of examining the specimens in company with Dr. Kemp. He very kindly allows me to state his agreement with me that neither in the "Challenger" specimen examined by him in 1909, nor in that now recorded from South Africa, is there any trace of podobranchs attached to the epipods of the chelipeds. The large arthrobranchs, however, lie very close to the epipods, and it requires some care, especially with ill-preserved specimens like that from the "Challenger," to make sure that their points of insertion are really separated by a considerable interval.

GENNADAS KEMPI, *Stebbing*.

G. kempi, Stebbing, Trans. Roy. Soc. Edinburgh, L, pt. ii, p. 283, pl. xxvii, 1914.

Occurrence.—Station 77, off Cape, 755 fath., trawl, 9 ♂.

Station 87, off Cape, 1,014 fath., closing net, 8 ♂.

Station 357, off Cape, 900 fath., trawl, 3 ♂.

Remarks.—In all these specimens the petasma agrees so closely with Stebbing's figure as to leave no doubt as to the identity of the species. In other characters the only important divergence from Stebbing's account is that the second

segment of the antennular peduncle, as seen from the side, is in no case more than $\frac{3}{4}$ as long as the third.

In view of the close resemblance, pointed out by Stebbing, between the petasma of this species and that of *G. calmani*, Kemp, it is important to record that I have confirmed, in the syntypes of the latter species, the presence of podobranchs on the first three peræopods, while they are certainly absent in *G. kempi*.

Mr. Stebbing does not indicate the size of his specimen. The more complete of those now recorded measure about 29 mm. in total length.

GENNADAS CAPENSIS, sp. n. (Plate I., Figs. 1, 2.)

Occurrence.—Station 87, off Cape, 1,014 fath., closing net. 2 ♂.

Description.—The larger and more perfect specimen measures 40 mm. in total length. The form of the rostral crest does not differ greatly from that found in *G. parvus* and other species. The antennal and subantennal angles are both pointed. The branchiostegal spine is minute but distinct. The distance between cervical and post-cervical grooves, dorsally, is about one-fifth the distance from the latter to the hind margin of carapace.

The second segment of the antennal peduncle is dorsally about two-thirds as long as the third. The antennal scale (Fig. 1) is relatively broadly rounded at the top, which extends well beyond the external spine.

The distal segment of the mandible palp is shorter than the width of the first segment. In the maxilla the proximal lobe of the distal lacinia, like the adjacent lobe of the proximal lacinia, is strongly constricted towards the base. The endopod of the first maxilliped is equal to the exopod, its third segment nearly twice as long as the second, its terminal segment very minute. The merus of the second maxilliped is nearly twice as long as wide, and the distal expansion is one-third of the total length.

In the third peræopods the merus is slightly longer than the carpus; the chela is more than half the length of the carpus and the fingers are shorter than the palm.

The sternum of the first abdominal somite bears a pointed median tooth. Each half of the petasma (Fig. 2) is roughly quadrangular with the distal outer angle produced into a broad, acutely-pointed lobe bearing a small tooth on its inner edge; the inner angle is produced in a rounded lobe separated by a shallow depression from the rounded distal end of the inner edge and, like it, shagreened with minute spinules.

On the anterior face of the lamina are several lobes, one of the most characteristic being a curved clavate process which lies tucked away in a depression below the inner marginal

fold; in the drawing it is shown as partly raised from this depression.

The telson tip has about 8 setæ between the single pair of lateral spines.

Remarks.—The petasma of this species appears to approach most closely to those of *G. calmani*, Kemp, and *G. kempi*, Stebbing, in both of which the equivalents of most of its marginal lobes can be identified; it differs from both, however, in the lobes of its anterior surface. The absence of podobranchs from the first three peræopods allies the species with *G. kempi*, from which indeed it is difficult to find any characters of importance, apart from the petasma, by which to separate it.

GENNADAS GILCHRISTI, sp. n. (Plate I., Figs. 3, 4.)

Occurrence.—Station 77, off Cape, 755 fath., trawl, 1 ♂.

Station 84, off Cape, young fish trawl at 500 fath. (depth 790 fath.), 1 ♂.

Station 87, off Cape, 1,014 fath., closing net, 4 ♂.

Station 357, off Cape, 900 fath., trawl, 1 ♂.

Description.—A nearly perfect specimen measures 25 mm. in length. The rostral crest is only slightly raised above the dorsal outline of the carapace. The antennal and subantennal angles are acute. The branchiostegal spine is small but rather prominent. The distance between cervical and post-cervical grooves, dorsally, is about one-fourth of the distance from the latter to the hind margin of carapace.

The second segment of the antennal peduncle is dorsally more than half as long as the third. The antennal scale (Fig. 3) is narrowly rounded at the tip, which hardly projects beyond the external spine.

The distal segment of the mandible palp is as long as the width of the first segment. In the maxilla the proximal lobe of the distal lacinia is wider than the adjacent lobe of the proximal lacinia and is not constricted at the base. The endopod of the first maxilliped is hardly as long as the exopod, its third segment not twice as long as the second, and the terminal segment one-fifth as long as the third. The merus of the second maxilliped is three-fifths as broad as long, and the distal expansion is about one-fourth of the total length.

In the third peræopods the merus is very slightly shorter than the carpus; the chela is a little less than two-thirds as long as the carpus, and the fingers three-fourths as long as the palm.

The sternal process of the first abdominal somite is less acute than in *G. capensis*. Each half of the petasma (Fig. 4) has on its distal margin externally a pointed lobe with a strong tooth external to its base; the middle of the distal margin is occupied by a divergent pair of long clavate processes; internally there is a short pointed lobe separated from the inner edge and overlapped in front by a broad semi-circular flap.

The telson tip has about six setæ between the single pair of short external spines.

Remarks.—A general correspondence can be traced between the lobes of the petasma in this species and those shown in *G. parvus* and *G. alcocki* by Kemp and in *G. similis* by Stephensen; from all of these, however, the petasma is distinguished at a glance by the long, divergent, clavate processes in the middle of the distal margin.

GENNADAS INTERMEDIUS, *Spence Bate.*

G. intermedius, Spence Bate, Rep. Crustacea Macrura, "Challenger," p. 343, pl. lviii, fig. 3, 1888; Kemp, P.Z.S., p. 723, pl. lxxiii, figs 7-12, pl. lxxv, fig. 3, 1909.

Occurrence.—Station 84, off Cape, young fish trawl at 500 fath. (depth 790 fath.), 1 ♂.

Station 87, off Cape, 1,014 fath., closing net, 9 ♂.

Remarks.—The form of the petasma in these specimens leaves no doubt that they belong to this species. They differ from the type specimens, re-described by Kemp, in the fact that the dorsal tooth of the rostrum is often (but not always) absent; that the distance between the two cervical grooves is nearer one-third than one-half of the distance from the posterior one to the hind margin of the carapace; that the maxilla has the distal lobe of the proximal lacinia narrower than the adjacent lobe of the distal lacinia; and that the sternal tooth of the first abdominal somite is strong, procurved and acute.

The largest complete specimen is 54 mm. in total length.

GENNADAS, spp. indet.

Occurrence.—Females or specimens so imperfect as to be indeterminable were found at the following stations:—

Station 87, off Cape, 1,014 fath., closing net.

Station 357, off Cape, 900 fath., trawl.

Station 523, off Cape, 1,800 fath., trawl.

Station 535, off Cape, 1,500 fath., trawl.

ARISTÆOMORPHA FOLIACEA (*Risso*).

A. foliacea (Risso), Bouvier, Res. Camp. Sci. Monaco, XXXIII, Pénéidés, p. 53, pl. iii, fig. 1, pl. xi, figs. 1-5, 1908 (with synonymy); Kemp and Sewell, Rec. Ind. Mus. VII, p. 18, pl. 1, fig. 5, 1912.

Aristeius rostridentatus, Spence Bate, Ann. Mag. Nat. Hist. (5) VIII, p. 189, 1881; "Challenger" Rep. Macrura, p. 317, pl. li, 1888.

Aristæomorpha rostridentatus, Stebbing, Ann. S. Afr. Mus. XV, p. 24, 1914.

Aristeomorpha rostridentata, Parisi, Atti. Soc. Ital. Sci. Nat. LVIII, p. 59, figs. 1, 2, 1919.

Nec *A. rostridentata*, Wood-Mason, Ann. Mag. Nat. Hist. (6) VIII, p. 286, 1891; Illustr. Zool. Investigator, Crust., pl. ii, fig. 1; Alcock, Cat. Indian Deep-sea Macrura, p. 39, 1901; Kemp and Sewell, Rec. Ind. Mus. VII, p. 17, pl. i, fig. 6, 1912.

Occurrence.—Station 115, off Natal, 230 fath., trawled, 2 ♂, 1 ♀.

Remarks.—Recent writers have all recognised two species in the genus *Aristæomorpha*, the Mediterranean and East Atlantic *A. foliacea* (Risso) and the Indo-pacific *A. rostridentata* (Spence Bate). No one, however, had attempted to indicate, from a comparison of specimens, the differential characters of the two species until Kemp and Sewell's paper of 1912. These authors had not the actual type-specimens of *A. rostridentata* before them. By the kindness of Dr. Annandale and of Prof. Gravier I have now been able to compare specimens from the Mediterranean and from the Atlantic coast of Morocco with the holotype of *A. rostridentata* from the Fiji Islands in the "Challenger" collection, without finding a single constant difference between them. I therefore regard Spence Bate's species as a synonym of *A. foliacea* (Risso). Parisi's figures quoted above show that the same species occurs in Japanese waters, and the specimens obtained by Dr. Gilchrist now extend its range to South Africa.

On the other hand, the specimens from Indian seas referred to *A. rostridentata* by Wood-Mason, Alcock, and Kemp and Sewell differ in a number of characters, most of which have been pointed out by the last-named authors. Dr. Annandale has kindly lent me for examination the female specimen figured by Wood-Mason. It must, I think, be regarded as the type of a distinct species, for which I propose the name *A. wood-masoni*. The distinguishing characters of the two forms are as follows:—

Carapace deeper; length of pterygostomian area not more than 2.5 times its height. Exopod of uropods produced beyond the external spine for one-fifth of its length; endopod just reaching tip of telson. Dactylus of last two pairs of peræopods half as long as propodus.—*A. wood-masoni* nom. nov. (= *A. rostridentata*, Wood-Mason, Alcock, Kemp and Sewell, non Spence Bate).

Carapace less deep; length of pterygostomian area 3.5 to 4 times its height. Exopod of uropods produced beyond the external spine for one-seventh of its length or less; endopod reaching well beyond tip of telson. Dactylus of last two pairs of peræopods little more than one-third as long as propodus.—*A. foliacea* (Risso) (= *A. rostridentata*, Spence Bate.)

The following measurements are given for comparison with those recorded by Kemp and Sewell. I have taken as holotype of *A. rostridentata* the largest of the three specimens in the "Challenger" collection. Spence Bate's measurement of the total length evidently excludes the rostrum.

	Holotype of <i>A. rostri-</i> <i>dentatus</i> .	Natal specimens.		
		♀	♂	♂
Sex	♀	♀	♂	♂
Total length	169	162†	146	132†
Length of rostrum ..	38.5	36†	36	25†
Length of carapace ..	44.5	43	36.5	38
Length of pterygosto- mian area.. ..	20	18.5	15.5	16.15
Breadth (height) of pterygostomian area	4.75	5.0	4.0	4.5
Ratio of length to height of pterygostomian area	4.2	3.7	3.8	3.6

The two males from Natal have the rostrum elongated as in the female. This may indicate immaturity, but the pterasma in these specimens does not differ from that of a male of similar size from Cape Spartel in which the rostrum is short.

† Rostrum imperfect.

HALIPORUS TRIARTHURUS (*Stebbing*).

Haliporoides triarthrus, Stebbing, Ann. S. Afr. Mus., XV, p. 21, pls. lxx, lxxi, 1914.

Occurrence.—Station 98, off Natal, 218 fath., trawled, 8 immature.

Station 99, off Natal, 220 fath., trawled, 3 ♀

Remarks.—The largest specimen, a female, is 150 mm. long, thus greatly exceeding the size of Stebbing's specimens. In one a few millimetres shorter the longer flagellum of the antennule measures 195 mm. and the antennal flagellum 235 mm.

This species resembles very closely indeed *H. sibogæ*, de Man (*Siboga Exp. Decapoda*, Pt. I, p. 38, pls. iii and iv, figs. 10-10q, 1911), of which, by the kindness of Prof. Max Weber, I have been able to examine a syntype. It differs from that species in the strongly arched dorsal crest rising from immediately in front of the cervical groove. Behind the groove the "medio-dorsal carina" of Stebbing is very slight. In all other characters the resemblance to *H. sibogæ* is almost exact. As in that species, there are two spinules on the side of the carapace just behind the cervical groove, but they are very small.

Stebbing has established for this species the genus *Haliporoides*, the only distinctive character of which seems to be the separation of a basal segment in the palp of the mandible. De Man's figure of the palp of *H. sibogæ* shows, however, a

very distinct line marking off the basal segment, and I find that the syntype which I have examined has the palp exactly similar in this respect to that of the present species. On the other hand, in *Haliporus equalis*, Sp. Bate (as figured by de Man and as I have verified in one of the syntypes) and, according to Bouvier, in several other species of the genus, the basal segment is completely coalesced with the second. This character alone appears an inadequate basis for generic separation, but, in any case, *H. triarthrus* must be congeneric with *H. siboga*.

SOLENOCERA, sp.

Occurrence.—Station 99, off Natal, 22 fath., trawled, 19

Remarks.—The single specimen is dry and otherwise imperfect. Of the two species of the genus described from S. African waters by Stebbing, it resembles most closely *S. africanus* (Ann. S. Afr. Mus. XVII, p. 32, pl. xciii a, 1917) in the form and armature of the rostrum, but it differs in having a postero-dorsal tooth on the sixth somite of the abdomen and in having the palp of the mandible narrowly produced distally.

FUNCHALIA WOODWARDI, *Johnson* (Plate II, Fig. 5,
Plate III, Figs. 6-8).

Funchalia woodwardi, J. Y. Johnson, Proc. Zool. Soc., p. 895, 1867; Bouvier, Crust. Déc. (Pénéidés), Res. Camp. Sci. Monaco, XXXIII, p. 93, figs., 1908 (with synonymy); Lenz and Strunck, Deutsche Südpolar Exp. XV (Zool. VII), p. 393, pls. xvi and xvii, figs. 1-19, 1914; Balss, Zool. Anz. XLIV, p. 593, 1914; Bouvier, Obs. compl. Crust. Déc., Res. Camp. Sci. Monaco, LXII, p. 13, 1922.

Occurrence.—Station 530, off Capé, 135 fath., trawled, 39

Remarks.—The largest specimen (Fig. 5) measures 149 mm. in total length and the smallest 130 mm. The Holotype, with which I have compared them, has the rostrum broken, but its total length can be estimated at about 157 mm.* The largest specimen recorded since Johnson's time measures only 100 mm. (Bouvier, 1922) and the published descriptions of Bouvier and of Lenz and Strunck are based upon still smaller specimens which, in some respects, may not have assumed fully adult characters.

The rostrum is not upturned at the tip as in Bouvier's figures, and carries a conspicuous fringe of long, stiff, feathered setæ on its concave lower edge; it reaches well beyond the base of the second segment of the antennular peduncle. A small hepatic spine is present in all the specimens.

Bouvier's description and figures of the mandible (confirmed by Lenz and Strunck) imply that the "stylet" is triangular in section with the two edges of the posterior face finely

* The length is given by Johnson as 6½ inches, which is certainly too great. Bouvier's translation of this as 173 mm. adds to the excess.

denticulate. In our specimens the stylet (Fig. 6), which I regard as the incisor process, is a flattened scythe-like blade, evenly arched (not sinuous as in Bouvier's figure), with its oral margin thinned away to a knife-edge which is obliquely striated and finely serrated (Fig. 6a). It seems likely that this striated knife-edge may have given rise to the appearance interpreted by Bouvier as a third face. At the proximal end of this edge is a small blunt knob which probably represents a vestigial molar process. The distal edge of the second segment of the palp is distinctly concave. When the oral region is viewed from below (Fig. 7) without disturbing any of the mouth-parts, the great scythe-like mandibles are very conspicuous, crossing in the middle line and projecting on opposite sides of the mouth.

The maxillula has the strongly curved palp distinctly divided into two sub-equal segments, the first tapering, the second cylindrical. The maxilla differs a good deal in the outline of the scaphognathite from Bouvier's figure. The endopodite has a brush of fine setæ externally, its inner edge is beset with short spinules, and there are three large hooked spines at the distal end. The scaphognathite is fringed with long setæ.

The first maxillipeds have the first joint in the endopodite more distinct than Bouvier indicates, and the number of setæ on the first segment is much greater. The third maxilliped reaches the end of the antennal peduncle.

In the chelipeds the fine denticulate crest is present on both fingers, not only on the immovable one as Bouvier states. The second pair extend to the middle of the carpus of the third maxilliped, and the third pair a little beyond.

The telson has the dorsal surface scabrous with minute spines and each lateral margin has a row of slightly larger spines, instead of only three.

The gill-formula (ascertained by dissecting both sides of one specimen) differs from that given by Bouvier (1908, p. 91) in there being only two gills besides the podobranch on the somite of the second maxilliped. The number of the gills on this somite is therefore the same as that found by Bouvier in the post-larval "*Grimaldiella*"-stage of *Funchalia*, although I am inclined to think that the upper of the two gills on the body-wall is a pleurobranch rather than an arthrobranch.

The thelycum (Fig. 8) differs a little from that described and figured by Bouvier. The "saillie en croissant" between the posterior legs is represented by a low convex boss with a group of granules (or very short spinules) in the middle. The depression between this boss and the angular prominence of the penultimate segment has its floor traversed by a median longitudinal ridge separating a pair of deep pits. On each side of the depression is a high longitudinal wall between the bases of the last two pairs of legs.

PENÆOPSIS MONOCEROS (*Fabr.*).

Metapeneus monoceros, Alcock, Cat. Crust. Ind. Mus. III, Peneus, p. 18, pl. iii, figs. 7-7c, 1906.

Penæopsis monoceros, de Man, Siboga Exp. Decapoda, pt. i, p. 55, 1911; Stebbing, Ann. S. Afr. Mus. XV, p. 70, 1915.

Occurrence.—Station 386, off Natal, 38 fath., trawled, 3 ♀, 1 ♂.

Remarks.—The specimens are in close general agreement with the descriptions of Alcock and de Man, but the petasma of the male agrees better with Alcock's figure than with those of Kishinouye and de Man.

PENÆOPSIS PHILIPPI (*Spence Bate*).

Penæopsis philippii, Calman, Ann. Mag. Nat. Hist. (9)XII, p. 536, 1923 (with synonymy).

Occurrence.—Station 184, off Natal, 191 fath., trawled, 3 ♂, 1 ♀.

Remarks.—I have discussed elsewhere the characters and synonymy of this species. In the female specimen now recorded, the outline of the thelycum resembles that shown in Fig. 1 B of the paper quoted, but the longitudinal and transverse grooves are almost entirely obliterated.

PENÆUS SEMISULCATUS, *De Haan*.

Peneus monodon, Alcock, Cat. Crust. Ind. Mus. III, Peneus, p. 8, pl. i, figs. 1-1b, 1906.

Penæus semisulcatus, de Man, Siboga Exp. Decapoda, pt. i, p. 97, 1911; Stebbing, Ann. S. Afr. Mus. XV, p. 69, 1915; *id.*, Ann. Durban Mus. I, p. 441, pl. xxii, 1917.

Occurrence.—Station 386, off Natal, 38 fath., trawled, 1 ♀.

ACANTHEPHYRA PURPUREA, *A. Milne-Edwards*.

A. purpurea, Kemp, Fisheries, Ireland, Sci. Invest. I (1906) p. 4, pl. i, pl. ii, figs. 1-3, 1905.

A. batei, Stebbing, Mar. Invest. S. Afr. IV, Crust., pt. iii, p. 107, pl. xxivb, 1905.

A. purpurea and *A. multispina*, Stephensen, Danish Oceanogr. Exp. 1908-1910, II, Decapoda Macrura, p. 44, 1923.

Occurrence.—Station 87, off Cape, 1,014 fath., closing net, about 40 sp.

Station 277, off Natal, 820 fath., trawl, 2 sp.

Station 357, off Cape, 900 fath., trawl, 3 sp.

Station 523, off Cape, 1,800 fath., trawl, 1 sp.

Station 535, off Cape, 1,500 fath., trawl, 1 sp.

Remarks.—Sund has not yet published in full his reasons for separating the "var. *multispina*" of Coutière as a distinct species. Stephensen accepts the separation but only mentions characters which have already been discussed in detail by Kemp. Kemp's tabulation of the characters of a large number of specimens fails to reveal any obvious correlation

between the characters which Stephensen regards as distinctive. The specimens of the present collection support Kemp's opinion, for they all have the spine on the fourth abdominal somite which Stephensen says is never found in *A. purpurea*, while, on the other hand, only a few of them have more than five pairs of dorsal spines on the telson. Only in two specimens is the telson longer than the uropods, and while one of these has 10-9 spines on the telson the other has only four pairs. Stephensen's tables suggest the possible existence of more or less vaguely defined local races, but, unless some new characters can be brought forward, the establishment of a distinct species for the more spiny-tailed of these cannot be justified. If it were, as de Man and others have pointed out, Spence Bate's name *A. acanthitelsonis* has, by a long way, priority over Coutière's *A. multispina*.

ACANTHEPHYRA DEBILIS, *A. M.*-Edw.

Acanthephyra debilis, Kemp, Fisheries, Ireland, Sci. Invest. I (1906)

p. 16, pl. ii, figs. 4-7, 1905.

Systellaspis debilis, Coutière, Bull. Mus. Ocean. Monaco, XLVIII, p. 5, fig. 2, 1905.

A. debilis, Lenz and Strunck, Deutsche Südpolar Exped. XV (Zool. VII), p. 327, 1914.

S. debilis, var. *indica*, de Man, Siboga Exped. Decapoda, pt. iv, p. 51, pl. vi, figs. 11-11f, 1920.

Occurrence.—Station 77, off Cape, 755 fath., trawl, 1 ♂.

Station 84, off Cape, 500 fath. (sounding 790 fath.), young fish trawl, 1 sp.

Station 87, off Cape, 1,014 fath., closing net, 1 ♀, ovig.

Station 173, off Natal, 760 fath., trawl, 1 ♂.

Station 535, off Cape, 1,500 fath., trawl, 1 ♀ ovig.

Remarks.—A specimen of 40 mm. total length resembles the young stage described by Coutière as *S. bouvieri*. The larger specimens appear to agree better with the Atlantic specimens on which Kemp's description was based than with de Man's "var. *indica*," but the small differences of proportion by which the latter is distinguished demand a direct comparison of specimens.

The fourteen points which Coutière (l.c.) gives as distinguishing the genus *Systellaspis* from *Acanthephyra* are not all of equal value, and some of his statements are incorrect. The endopod of the first maxilliped of *A. purpurea*, as Kemp has stated, consists of three segments like that of the present species, and I am unable to appreciate the differences which Coutière finds in the maxillæ. Many of the other characters are of no more than specific value. The differences in the terminal segment of the second maxilliped and in the epipodite of the fourth pair of legs might be regarded as reinforcing the presence of luminous organs and the large size of the eggs, but until these distinctions have been verified over a greater range of species I follow Kemp placing all the species under *Acanthephyra*.

ACANTHEPHYRA STYLOROSTRATIS (*Spence Bate*).

Bentheocaris stylostratis, Spence Bate, Rep. Crustacea Macrura, "Challenger," p. 726, pl. cxxiii, fig. 4, 1888; (*stylirostratus*) Coutière, Bull. Inst. Oceanogr. Monaco, No. 104, p. 10, fig. 2, 1907; (*stylostris*) Lenz and Strunck, Deutsche Südpolar Exp. XV (Zool. VII), p. 325, 1914.

Occurrence.—Station 173, off Natal, 760 fath., trawl, 1♂, ovigerous.

Remarks.—No ovigerous specimen of *Bentheocaris* has hitherto been recorded. Only one of the two type specimens of *B. stylostratis* remains in the "Challenger" collection. It is in fragments, but the presence of an *appendix masculina* equal in length to the *appendix interna* on the second pleopods shows that, as Spence Bate doubtfully stated, it may be regarded as an adult male. The agreement between it and the Natal specimen, in all characters in which they can be compared, leaves no doubt that they belong to the same species. It seems quite possible that *B. exucns* represents a younger stage of the same species, but the small size and bad condition of the holotype prevent a close comparison.

The Natal specimen is 48 mm. in total length; the carapace and rostrum (excluding spines) together measure 13 mm. and the sixth somite of the abdomen 8.5 mm. There are eight teeth on the rostrum, those in front spiniform, deflexed as in Coutière's fig. 2a. The carapace is keeled nearly to its hind margin, the keel not interrupted by the cervical groove, which is not set quite so far back as in Spence Bate's figure. The sixth abdominal somite has a small tooth posteriorly, as it has also in the holotype. The ocular peduncle is somewhat flattened from above downwards and exceeds the diameter of the cornea.

The first segment of the antennular peduncle is relatively shorter than in Coutière's figure, little exceeding the stylocerite, and the second and third are subequal. The antennal scale is much narrowed at the tip, where it has a very small external tooth. The carpus of the first peræopods has a deep rounded notch, defined distally by a narrow hooked process, on the inner and anterior side. I have not found any trace of the "sense-organ" observed by Lenz and Strunck on the carpus of the second pair. The armature of the telson tip agrees with Coutière's figure.

The branchial formula agrees with that given by Kemp for *Acanthephyra* (Fisheries, Ireland, Sci. Invest., I (1910) p. 56), 1908, except that I have failed to find any trace of an epipod on the penultimate legs.

The endopodite of the first maxillipeds has a small distal segment, as in *Acanthephyra*, and, as in that genus, the distal endites of the maxilla are narrow and project well beyond the basal endite.

The eggs measure about .93 x .7 mm.

I am unable to find a single character by which to distinguish *Bentheocaris* from *Acanthephyra* unless it be the form and armature of the rostrum, and in that respect I cannot regard the difference between the present species and *Acanthephyra cucullata*, Faxon, as great enough to justify maintaining the genus *Bentheocaris*.

HYMENODORA GLACIALIS (*Buchholz*).

H. glacialis, G. O. Sars, Norw. N. Atlantic Exp. Crustacea I, p. 37, pl. iv, 1885; Kemp, Fisheries Ireland Sci. Invest. 1908, 1, p. 72, figs. 1-3, 1910; Lenz and Strunck, Deutsche Südpolar Exp. XV (Zool. VII), p. 331, 1914; Stephensen, Danish Oceanogr. Exp. 1908-1910, II, Decapoda Macrura, p. 59, 1923.

Occurrence.—Station 87, off Cape, 1014 fath., closing net, 4 sp.

Station 535, off Cape, 1,500 fath., trawled, 1 sp.

Remarks.—The five specimens are small and much damaged. All have more or less acuminate rostrum and three of them on dissection were found to have a minute bifid vestige of a podobranch on the second maxilliped. They thus present the characters of *H. gracilis*, Smith, which was united with *H. glacialis* by Faxon and by Kemp, but has been again separated by Stephensen. The latter assigns to *H. gracilis* an area of distribution to the south of that occupied by *H. glacialis*, but only gives as distinctive the two characters mentioned above. That these two characters are constantly associated appears unlikely and indeed a "Challenger" specimen from the Canaries identified as *H. mollicutis*, Sp. Bate, has a very abbreviated rostrum and a podobranch on the second maxilliped like that found in the South African specimens.

NEMATOCARCINUS LANCEOPES, *Spence Bate*.

N. lanceopes, Spence Bate, Rep. Crustacea Macrura "Challenger," p. 804, pl. cxxxii, 1888; Stebbing, Trans. Roy. Soc. Edinburgh, L, p. 298, pl. xxxii b, 1914; *id.*, Ann. S. African Mus. XV, p. 44, 1914.

Occurrence.—Station 84, off Cape, 500 fath. (sounding 790 fath.), young fish trawl, 3 young specimens.

Station 343, off Cape, 470 fath., trawl, 19♀, 1♂.

Station 354, off Cape, 626 fath., trawl, 16♀, 2♂.

Station 517, off Cape, 600 fath., trawl, 6♀.

Station 522, off Cape, 1,200 fath., trawl, 9♀, 2♂.

Remarks.—I follow Stebbing in using the name *N. lanceopes* for the species with long rostrum which is abundant (Gilchrist records 1,900 specimens at Station 522) in the deeper waters off the Cape, but I do not venture to give a synonymy of the species. The "Challenger" types of many species are no longer in a condition to allow Spence Bate's descriptions to be confirmed, corrected or supplemented.

The largest female measures about 160 mm. in total length and one of the few males reaches 120 mm. The rostrum is not perfect in any specimen, but when it appears to be nearly complete it is always longer than the carapace. In a large specimen the ratio is 1 : 1.4. It bears very numerous teeth above, in a continuous series, crowded at the base, becoming widely spaced towards the tip, and four or five teeth below. The telson may be a little shorter to a little longer than the outer plates of the uropods. The first peræopods extend beyond the antennal scale by from one quarter to nearly the whole length of the chela ; the carpus is a little more than three times as long as the chela. In only a very few of the specimens are any of the posterior legs attached. In two cases the penultimate legs when extended forward have the carpus clear of the antennal scale, the propodus less than one-twelfth of the carpus, and a little shorter than the dactylus, which is slender and hardly at all undulated. In one specimen the last legs have the carpus not clear of the antennal scale, the propodus about one-twentieth of the carpus and more than twice as long as the dactylus, which is flattened, triangular, and about two-thirds as wide as it is long.

Many of the females carry eggs, which measure from 0.8 x 0.6 mm. to 1.0 x 0.75 mm. approximately.

STYLODACTYLUS BIMAXILLARIS, *Spence Bate.*

- S. bimaxillaris*, Spence Bate, Rep. Crust. Macrura, "Challenger," p. 855, pl. cxxxviii, fig. 3, 1888.
S. serratus, Stebbing, Ann. S. Afr. Mus., XV, p. 51, pl. lxxvi, 1914; (*nec* A. Milne-Edwards).

Occurrence.—Station 77, off Cape, 755 fath., trawl, 1 sp.

Remarks.—The single specimen is a young one, measuring only about 22 mm. in total length, while Stebbing records specimens of 52 and 75 mm. It presents no conspicuous difference from Stebbing's figures except for the presence of a minute tooth on the mid-dorsal line of the carapace near the hinder margin. The antennal scale is about equal in length to the carapace measured from the orbit. I am indebted to Dr. Stanley Kemp for the synonymy given above, which is taken from his unpublished notes on the genus.

CHLOROTOCUS CRASSICORNIS (*A. Costa*).

- C. crassicornis*, Stebbing, Ann. S. Afr. Mus. XV, p. 42, pl. lxxv, 1914.

Occurrence.—Station 33, off Cape, 150 fath., trawl, 1 ♂, 1 ♀.
 Station 97, off Natal, 205 fath., trawl, 3 ♀.

Remarks.—The specimens differ in no obvious way from Stebbing's account or from the earlier descriptions which he quotes. They also agree closely with a Mediterranean specimen in the Norman collection. The largest, a female from Station 97, measures about 78 mm. in total length.

The type of *C. incertus*, Spence Bate, is not in the Museum collection, and Stebbing's question whether it is identical with *C. crassicornis* or belongs to a different genus must remain unanswered.

PLESIONIKA MARTIA (*A.M.E.*)

Plesionika martia, Kemp, Fisheries Ireland Sci. Invest., 1908, I, p. 93, pl. xii, figs. 1-4, 1910; Stebbing, Ann. S. Afr. Mus. VI, p. 392, 1910.

Occurrence.—Station 125, off Natal, 270 fath., trawl, 1 ♀.

Station 174, off Natal, 260 fath., trawl, 2 ♂, 1 ♀.

Remarks.—The largest specimen, a male, measures about 108 mm. in total length.

MERHIPPOLYTE AGULHASENSIS (*Spence Bate.*)

M. agulhasensis, Spence Bate, Rep. Crust. Macrura, "Challenger," p. 619, pl. cx, fig. 4, 1888; Stebbing, Mar. Invest. S. Afr. IV, p. 103, 1905; Calman, Ann. Mag. Nat. Hist. (7) XVII, p. 32, 1906.

Occurrence.—Station 174, off Natal, 260 faths., trawl, 1 ♀.

Remarks.—The single specimen, an ovigerous female about 58 mm. in total length, agrees closely with the syntypes of the species.

AEGEON LACAZEI, (*GOURRET.*)

Aegeon lacazei, Kemp, Fisheries, Ireland, Sci. Invest., 1908, p. 156, pl. xxii, figs. 1-5, 1910.

Occurrence.—Station 97, off Natal, 205 fath., trawl, 1 ♀.

Remarks.—The specimen, 32 mm. in length, agrees very closely with Kemp's description and figures and also with an Irish specimen identified by him. The teeth of the median crest of the carapace are, however, subequal, and the number of teeth on the second lateral carina (6-7) does not differ from that found in some specimens of *A. cataphractus*. The oblique row of tubercles found in the last-named species between the median and first lateral carinae (Kemp, Rec. Ind. Mus. XII, p. 376, 1916) is absent, but the single or double tubercle between the first and second lateral carinae in *A. cataphractus* is represented by a small sharp tooth.

The specimen from Senegambia referred to *A. cataphractus* by Miers certainly belongs to that species, and since Stebbing's record from the Cape (Mar. Invest. S. Afr., Crustacea, p. 50, 1900,) refers to shallow water (40 fathoms) it is unlikely that there can have been any confusion with *A. lacazei*.

POLYCHELES DEMANI, *Stebbing.*

Polycheles beaumontii (?), Stebbing, Ann. S. Afr. Mus. VI, p. 25, 1908. *P. demani*, Stebbing, op. cit. XVII, p. 28, pl. xcii, 1917.

Occurrence.—Station 526, off Cape, 1,400 fath., trawled, 1 ♀, 1 ♂.

Remarks.—Selbie, de Man and Stebbing are agreed that this species is to be separated from *P. granulatus* (including *P. beaumontii*), but do not make clear what characters they regard as distinctive. Selbie calls attention to the presence in *P. demani* of two spines on the basal segment of the antennule. Our specimens have only one spine in this position, as in *P. granulatus*. On the other hand they have, like all Stebbing's specimens, four instead of three teeth on the middle division of the lateral edge of the carapace. The posterior division has 23 or more teeth diminishing to granules behind; Stebbing's specimens had 18 to 21, while *P. granulatus* has 12 to 16.

From the fact that Stebbing does not refer, in his later paper, to his record of two small specimens of *P. granulatus* (Ann. S. Afr. Mus. XV, p. 11, 1914) it may perhaps be inferred that he does not wish to press for the inclusion of that species alongside of the allied *P. demani* in the Cape fauna.

POLYCHELES TYPHLOPS, Heller.

Polycheles typhlops, Selbie, Fisheries, Ireland, Sci. Invest. 1914, p. 12 pl. 1, figs. 1-13, 1914; de Man, Siboga Monogr. XXXIXa2, Decapoda, pt. iii, p. 24, 1916; Bouvier, Res. Camp. Sci. Monaco, Fasc. L, p. 36, pl. ii, figs. 1-6, 1917.

Occurrence.—Station 125, off Natal, 270 fath., trawl, 1 ♀.

Remarks.—The specimen, an ovigerous female, measures 110 mm. in total length and is thus larger than any specimen of this species recorded from the Atlantic, although it is exceeded by de Man's specimen of 113 mm. from the Bali Sea.

STEREOMASTIS SCULPTA (S. I. Smith).

Polycheles sculptus, Stebbing, South African Crust., Pt. II, Mar. Invest. S. Afr., p. 36, 1902; Selbie, Fisheries, Ireland, Sci. Invest. 1914, I, p. 18, pl. ii, figs. 1-9, 1914; Bouvier, Rés. Camp. Sci. Monaco, Fasc. L, Crust. Décapodes, p. 51, pl. iii, fig. 1, 1917.

Stereomastis sculpta, de Man, Siboga Monogr. XXXIXa2, Decapoda, pt. iii, p. 8, 1916.

Occurrence.—Station 86, off Cape, 537 fath., trawl, 1 ♂.
Station 518, off Cape, 600 fath., trawl, 1 ♀.

Remarks.—Stebbing records this widely-ranging species from off the Natal coast and it is now recorded from off South-west Africa. The female measures 128 mm. in length, the male 96 mm.

ERYONEICUS-STAGE (= ERYONEICUS FAXONI, Bouvier).

E. faxoni, Selbie, Fisheries, Ireland, Sci. Invest., 1914, I, p. 29, pl. iv, figs. 1-5, 1914; Sund, Nature, June 3, 1915, p. 372; Bouvier, Rés. Camp. Sci. Monaco, L, p. 78, pl. iv, figs. 14-15, pl. v, figs. 13-16, 1917.

Occurrence.—Station 85, off Cape, 790 faths., closing net.
1 ♀.

Remarks.—The specimen is 37 mm. in total length and it agrees, except in some trifling details of the spinulation of the carapace, with the description given by Selbie. I see no reason for dissenting from Sund's conclusion that *E. faxoni* is a post-larval stage of *S. sculpta*.

STEREOMASTIS NANA (*S. I. Smith*).

- Pentacheles nanus*, *S. I. Smith*, Rep. Comm. Fisheries for 1882, Washington, p. 359, 1884; *id.*, Rep. for 1885, p. 47, pl. vii, figs. 1, 1a, 1886.
Polycheles nanus, Stebbing, Ann. S. Afr. Mus. VI, p. 27, 1905.
Polycheles grimaldii, Bouvier, Bull. Mus. Oceanogr. Monaco, XXVIII, p. 4, 1905; *id.*, Res. Camp. Sci. Monaco, L, p. 52, pl. iii, figs. 2-4, 1917.
Polycheles nanus, var. *grimaldii*, Selbie, Fisheries, Ireland, Sci. Invest. 1914, I p. 21, pl. i, figs. 14-15, 1914.
Stereomastis grimaldii and *S. nana*, de Man, Siboga Monogr. xxxix a2, Decapoda, pt. iii, p. 4 (*cf.* p. 20), 1916.
Stereomastis nanus, Stebbing, Ann. S. Afr. Mus. XVII, p. 30, 1917.

Occurrence.—Station 522, off Cape, 1,200 fath., trawled, 2 ♂, 1 ♀.

Station 542, off Cape, 580 fath., trawled, 1 ♂, 1 ♀.

Remarks.—All the specimens have a distinct spine at the inner angle of the orbit and therefore belong to Bouvier's *P. grimaldii*, which I agree with Selbie in regarding as not more than a variety of *S. nana* and which may even be identical with the typical form of that species. Judging from the remarks of de Man (*op. cit.* p. 20) it is very likely that *S. andamanensis*, Alcock, should be added to the synonymy.

STEREOMASTIS SUHMI (*Spence Bate*). (Plate III, Fig. 9).

- Pentacheles suhmi*, Spence Bate, Ann. Mag. Nat. Hist. (5) II, p. 278, 1878.
Stereomastis suhmi, Spence Bate, "Challenger" Rep. Macrura, p. 154, pl. xv, figs. 3 and 4, 1888; Sund, Ann. Mag. Nat. Hist. (9) VI, p. 223, 1920.

Occurrence.—Station 522, off Cape, 1,200 fath., trawled, 1 ♂, 1 ♀.

Remarks.—This species does not appear to have been recorded since the "Challenger" obtained it to the west of Patagonia at comparatively slight depths (160-245 fathoms). The specimens now recorded are of small size (total length 36 mm.) and have the integument soft, as if from a recent moult. They resemble closely the holotype (from "Challenger," Station 305B) and paratypes (from Station 311). In all the "Challenger" specimens, as Sund has pointed out, the formula for the spines of the median row is 2, 1, 1, 2, 2, 1, c, 2, 2, 2, 2. In each of the South African specimens, however, there is, in front of the single spine preceding the cervical groove, a blunt-topped spine or very tall papilla, and, in front of the pair of spines on the hind margin of the carapace, another papilla, somewhat lower (Fig. 9). These blunt spines

or papillæ, of which traces can be perceived, more or less distinctly, on several of the type specimens, are of great interest for comparison with the specimen of *Eryoneicus* described below. The marginal spines are 5, 2, 8 on both sides of one specimen, 5, 2, 9 and 5, 3, 8 in the other. Three spines in the middle division are found in several of the type specimens, only on one side. The supralateral or branchial carinæ have 8-8 spines in one specimen, 6-8 in the other.

ERYONEICUS-STAGE (Plate IV, FIG. 10).

Occurrence.—Station 85, off Cape, 790 fath., closing net, 1 sp.

Total length 26 mm. The carapace is sub-globular, widest across the branchial regions, narrower in front, beset with fine hairs more numerous anteriorly. The rostrum is double, there is a strong spine at the inner angle of the rostral sinus, and the antero-lateral spine is large. The median dorsal spines (including the double rostrum) are arranged as follows: 2, 1, 1, 2, 2, *1*, 1, *c*, 2, 2, 2, *1*, 2. The numbers in italic indicate the position of two blunt spines or tall papillæ. The marginal carinæ have 5, 2, 9 and 5, 2, 10 spines on the two sides. The branchial carinæ have 7 spines. The upper submarginal carina has about six denticles in its anterior third and ends in a large antennal spine. There is a very prominent lower submarginal carina with 15 to 17 spines, most of them very large but diminishing to small tubercles in front and behind. In addition to the spines or spiniform tubercles on these carinæ there are numerous others on the dorsal surface, the most conspicuous being a line of four or five running back from the orbit, a group of six or seven on each side of the gastric region, a line of four behind the cervical groove, and a group of seven on each side between the median row and the branchial carina.

The median dorsal process on each of the first five abdominal somites is more or less distinctly tridentate, the anterior tooth obtuse. On the sixth somite there is a posterior spine with a double row of denticles in front, and on the base of the telson is a large curved spine. There are two lateral spines on each side of somites 2-6. The pleura are all pointed below, the fifth with a small denticle behind. The telson has six or seven pairs of lateral spines and no marked dorsal carinæ.

The eyestalk has a small blunt spine in front. The basal segment of the antennular peduncle has two spines. The scale has no teeth on its inner edge. The outer flagellum is less than half as long as the inner. The antennal scale is about as long as the peduncle, the renal tubercle a little shorter.

In the chelipeds the merus has one (right) or two (left) teeth about the middle of the hinder edge and one at the distal end. The second peræopods have the merus with two spines beyond the middle and two at the distal end; the carpus

has one proximal and two distal spines. The fifth peræopods have the propodus very slightly produced alongside the dactylus.

The first pleopods are slender styles apparently of two segments but not expanded distally. An appendix interna is present on the remaining pleopods.

Remarks.—The form described above differs from all the "species" of *Eryoneicus* hitherto described, notably in the spine-formula of the median ridge of the carapace; this formula, however, after omission of the two blunt spines, which, according to Sund, are lost in passing to the adult form, agrees exactly with that of *Stereomastis suhmi*, a species which is recorded above for the first time from the Cape Seas. This coincidence, together with the agreement in number of spines on the lateral and branchial carinæ, gives additional support to Sund's view that the species of *Eryoneicus* are immature stages of other genera of Eryonidæ; and this support becomes all but conclusive when it is added that the youngest specimens of *S. suhmi* possess the remains of the blunt spines in their proper position, completing the agreement with the dorsal spine-formula of the *Eryoneicus*.

PANULIRUS BÜRGERI (*de Haan.*)

Palinurus bürgeri, De Haan, Crust. Faun. Japon. p. 159, pls. xliii and xliv, fig. 1, 1841.

Panulirus bürgeri, Stebbing, Ann. S. Afr. Mus. VI, p. 34, 1908; Gravel, Ann. Inst. Oceanogr. Paris, III, fasc. IV, p. 32, pl. 1, fig. 6, 1911.

Occurrence.—Station 438, off Natal, 34 fath., trawled, 1 ♂, 2 ♀.

Remarks.—These specimens appear to be among those recorded in Dr. Gilchrist's report under the name *Palinurus ornatus*.

PALINURUS GILCHRISTI, *Stebbing.*

P. gilchristi, Stebbing, Mar. Invest. S. Afr., Crustacea (I), p. 31, pl. i, 1900; Selbie, Fisheries, Ireland, Sci. Invest., 1914, I, p. 44, 1914.

Occurrence.—Station 102, off Natal, 158 fath., trawled, 1 ♂, 1 ♀.

NEPHROPSIS STEWARTI, *Wood Mason.*

N. stewarti, Alcock, Cat. Indian Deep-Sea Crust., p. 159, 1901; *id.*, Illust. Zool. Investigator, Crust., pl. xxvii, figs. 1, 1a; de Man, Siboga Monogr. XXXIXa 2, Decapoda, pt. iii, p. 112, pl. iii, fig. 17, 1916.

Occurrence.—Station 115, off Natal, 230 fath., trawled, 1 ♀.

Remarks.—The specimen, 113 mm. in total length, with antennal flagella about 240 mm. long, agrees minutely with a specimen determined by Alcock. There can be no question

of confusion with the very different *N. atlantica* already recorded from Natal seas by Stebbing (Mar. Invest. S. Afr. II, p. 34), 1902.

NEPHROPS ANDAMANICUS, *Wood-Mason*.

- N. andamanicus*, J. Wood-Mason, Illustr. Zool. "Investigator," pt. I, Crust., pl. iv, 1892, pt. II, pl. viii, fig. 5, 1894; Alcock, Ann. Mag. Nat. Hist. (6) XIII, p. 226, 1894; de Man, Siboga Exp., Decapoda pt. III, p. 99, pl. iii, fig. 15, 1916.
N. thomsoni, var. *andamanica*, Alcock, Cat. Indian Deep-Sea Crust. Macr. and Anom., p. 153, 1901.

Occurrence.—Station 99, off Natal, 220 fath., trawled, 1 ♂, 1 ♀.

Station 115, off Natal, 230 fath., trawled, 2 ♂.

Remarks.—The largest specimen, a female from Station 99, is 175 mm. in length. The species has hitherto been known only from the Andaman Sea and the Bali Sea, so that the present record greatly extends its known range.

EXPLANATION OF PLATES, FIGURES.

Plate I.

- Fig. 1. *Gennadas capensis*, sp.n., Antennal Scale.
 „ 2. *Gennadas capensis*, sp.n. One half of Petasma seen from in front.
 „ 3. *Gennadas gilchristi*, sp.n. Antennal Scale.
 „ 4. *Gennadas gilchristi*, sp.n. One half of Petasma seen from in front.

Plate II.

- „ 5. *Funchalia woodwardi*. Female, from the side.

Plates III.

- „ 6. *Funchalia woodwardi*. Mandible, with palp. (a) Portion of cutting edge further enlarged.
 „ 7. *Funchalia woodwardi*. Oral region, seen from below.
 „ 8. *Funchalia woodwardi*. Thelycum.
 „ 9. *Stereomastis suhmi*. Carapace of young specimen, seen from the side.

Plate IV.

- „ 10. *Eryoneicus*-stage of *Stereomastis suhmi*, from the side.

NOTE ON SPECIMENS OF THE GENUS *SERGESTES*

By H. J. HANSEN, Copenhagen.

The material comprises five species, four of which are known from the North Atlantic and have been described and figured in a recent paper on the genus, viz., H. J. Hansen: Crustacés décapodes (Sergestides) provenant des Campagnes des yachts "Hirondelle" et "Princesse Alice" (1885-1915), in: Résultats des Campagnes scientifiques . . . par Albert Ier, Prince Souv. de Monaco, Fasc. LXIV, 1922. The fifth species is a very interesting form, of which only a single specimen, taken off the south-eastern part of the Cape Colony, was known.

SERGESTES ARCTICUS, *Kröyer*.

1922. *Sergestes arcticus*, H. J. Hansen, *Sergestides*, op. cit. p. 62, pl. i, figs. 1 and 2, pl. iii, figs. 3a-3s.

Occurrence.—Taken off Cape of Good Hope at two places, viz., Station 84, 500 fathoms (mid-water, over 790 fathoms), three males and three females. Station 357, 900 fathoms, one male and two females.

Remarks.—The specimens are of rather moderate size; the males are adult, and their petasma does not exhibit any difference from that of North Atlantic specimens.

SERGESTES GRANDIS, *Sund*.

1922. *Sergestes grandis*, H. J. Hansen, *Sergestides*, op. cit. p. 92, pl. v, figs. 3a-3n.

Occurrence.—This species has been secured at four stations: Off Cape of Good Hope, Station 49, 270 fath.; one very large female, 84 mm. long. Telson possesses three pairs of nearly rudimentary spines on the distal part, while at most two pairs were observed on the Monaco specimens.

Off Cape of Good Hope, Station 535, 1,500 fath.; one immature female.

Off Natal Coast, Station 277, 820 fath.; one immature female, 48 mm. long and rather mutilated.

Off Cape of Good Hope, Station 87, 1,017 fath.; four very young specimens, 21-22 mm. long, belong probably to this species.

SERGESTES CRASSUS, *H.J.H.*

(*S. splendens*, *Sund*.)

1922. *Sergestes crassus*, H. J. Hansen, *Sergestides*, op. cit. p. 98, pl. v, figs. 4a-4l.

Occurrence.—Taken at two stations, both off Cape of Good Hope: Station 357, 900 fath., one female, 36 mm. long.

Station 87, 1,014 fath., one large male.

The male is 41 mm. long, thus a little larger than any other specimen hitherto recorded, and some minor features may be noted. The terminal tooth on the rostrum is rudimentary. Exopod of uropods with 17 or 18 dark dots in the submarginal line. The petasma differs from that described and figured in the work quoted in some particulars; its processus ventralis is even a little shorter than lobus connectens; lobus terminalis has a quite small triangular protuberance at the middle of its inner margin where the process is bent, and this protuberance is certainly a rudimentary lobus inermis wanting in the Monaco specimens; finally, lobus armatus has not one but two extremely large hooks on the side of the distal portion.

SERGESTES GLORIOSUS, Stebb.

1905. *Sergestes gloriosus*, Stebbing, South African Crustacea, Pt. III, in Marine Invest. of South Africa, vol. iv, p. 84, pls. xxii-xxiii.

Occurrence.—Off Natal Coast, Station 174, 260 fath., one female.

This species was established on a single male, 50 mm. long, taken off Sandy Point, near Great Kei River, Transkei Land (the south-eastern portion of the Cape Colony), 1,463 m. Stebbing's description and many figures are very satisfactory (excepting his figure of the petasma); the species is somewhat similar to *S. crassus* and *S. splendens*, but differs in several features, above all in possessing a very large number of luminous organs already pointed out by Stebbing. As only one specimen was known, a partial redescription based on the single female and written with reference to descriptions and figures of other forms in the Monaco work may be given here.

The carapace has the gastro-hepatic groove deep on the sides, but indistinct above, while the cervical groove is distinct both dorsally and on the sides. Rostrum shaped nearly as, though a little shorter than, in *S. splendens*, a little longer than deep, with the terminal, acute, straight tooth proportionately long and slender, and originating much nearer to the upper than to the lower margin. Eyes and their stalks as in *S. splendens* (Monaco Rep., pl. vii, fig. 2b); antennule nearly as in *S. splendens*, with third joint conspicuously compressed and lower flagellum distinctly longer than third peduncular joint. (According to Stebbing's figure the lower flagellum in the male differs widely from that in *S. splendens*, being rather similar to the shape found in *S. robustus* (Monaco Rep., pl. vi, fig. 2e).) Antennal squama tapers considerably towards the end, though distinctly less than in *S. crassus*; its terminal margin is feebly rounded, the tooth is well developed and reaches beyond that margin.

Third maxilliped considerably shorter than third pair of legs; its dactylus is much more slender than in *S. crassus*, the distal half shows about three secondary articulations, and the lower margin has three very long bristles, while in *S. crassus* only two such bristles and no articulations are found (Monaco Rep., pl. v, fig. 4 d). Chelæ on second and third pairs of legs normally developed with both fingers slender, equal in length, and no long plumose setæ are found. Third leg a little more than half as long as the body. Fourth leg, when stretched forwards, reaches nearly to the front end of the eyes. Fifth leg a little more than half as long as the fourth, and its joints agree as to their relative length and breadth nearly with *S. robustus* (Monaco Rep., pl. vi, fig. 2h). Second branchia above third leg about three-fifths as high as the first, which is very high and considerably higher than the first branchia above fourth leg, and the last-named branchia is rather little higher than the second above the same leg.

Exopod of uropods somewhat more than four times as long as broad, and the glabrous portion occupies a little more than two-thirds of the outer margin, which has the tooth well developed.

The distribution of the luminous organs is very characteristic for this species ; on some places they are much more numerous than in *S. challengeri* or *S. splendens*, while on other parts their number seems to be lower, but I cannot do much more than confirm Stebbing's statements ; if a tolerably full account should have been given, it would have been necessary to undertake a somewhat detailed dissection of the single specimen, in reality to sacrifice it. The reason is that many organs are much more difficult to point out with certainty than is the case in the three other luminous species examined by me. Many organs, especially several on the lower surface of cephalothorax, and on sixth abdominal segment, are large and very convex, consequently easily observed ; but the organs differ exceedingly not only in size but also in the degree of their convexity, as many small organs are very flatly vaulted, with their surface slightly or scarcely raised above that of the surrounding skin, and therefore difficult to discover. (The histological study of the organs is to be performed by some future investigator ; perhaps some of the small organs may then be seen to have a somewhat less complicated structure than in *S. challengeri*.)

Then the enumeration of the observed organs. In the row on the inner side of the carapace at the upper border of the branchial cavity I found eight organs (Stebbing has seven) ; in the long row near the lower margin of the carapace I found, as Stebbing, 18 organs, but of the three organs placed higher upwards and more in advance I could only discern two. On the lower side of the three posterior thoracic segments the arrangement of the organs is mainly as in *S. splendens* (Monaco Rep., pl. vii, fig. 2g), but they are seemingly a little less numerous ; the organs on the five anterior abdominal segments could not be counted with certainty. Sixth abdominal segment has five large organs in the ventral median line, and besides at each lateral lower margin a row of about nine minute organs. The eye-stalk below at the eye with a single organ ; the antennular peduncle as usual with an organ near the end of third joint, but the four organs mentioned by Stebbing as placed on first joint I have been unable to see. On the lower side of the antennal squama a row with 12 organs, three or four of which quite small. Second maxilliped has one organ at the base of meros, one organ at the distal end of carpus and of propodus. Third maxilliped with one organ at the end of meros, carpus and propodus. First leg has one organ at the base of ischium, one on carpus near its end. Third leg has two organs on ischium, 10 organs (8 + 2) on meros, as drawn by Stebbing, but on the following joints no

organ could be detected. Fifth leg with one organ on the inner side of coxa, on ischium one organ near the base and one near the end, on meros one organ near the end of the lower margin. The basal joint of each pleopod either with two terminal organs closely set, or with a single organ. The basal joint of the uropod has two organs on the lower part of the inner side; the exopod has on the distal part of its proximal half and somewhat removed from the hairy margin a row with four or five organs; furthermore along the middle of its distal part about from the marginal tooth four well-developed organs. (The appendages, etc., not mentioned have not been investigated.)

The body measures 45 mm. in length, third maxilliped 18 mm., third leg 24 mm., fourth leg 15.5 mm., fifth leg 8.5 mm.

S. gloriosus is instantly and easily separated from every other species of the genus by the high number of conspicuous luminous organs on the antennal squama, on the meros of third legs and on the exopod of the uropods.

SERGESTES ARMATUS, Kr.

1922. *Sergestes armatus*, H. J. Hansen, *Sergestides*, op. cit. p. 174. pl. x, figs. 6a-6k.

Occurrence.—Taken at two stations of Cape off Good Hope: Station 87, in closing net, one immature specimen. Station 77, 755 fath., one female.

It differs only from the description and figures in the Monaco work in having the upper margin of the distal half of the rostrum less concave than the lower one.

(Issued 18th June, 1925.)

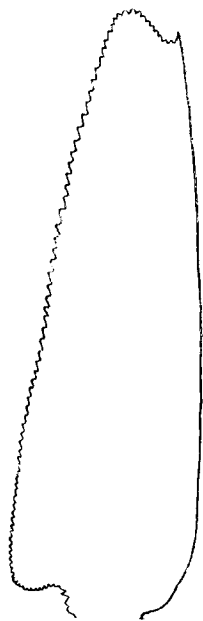


FIG. 1.

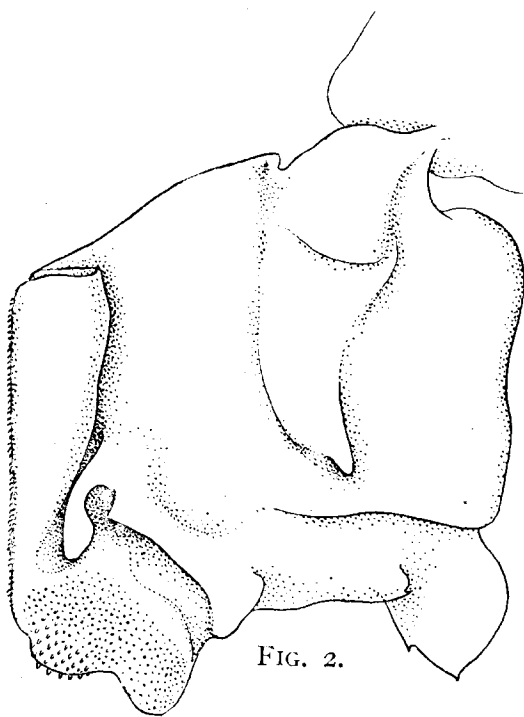


FIG. 2.

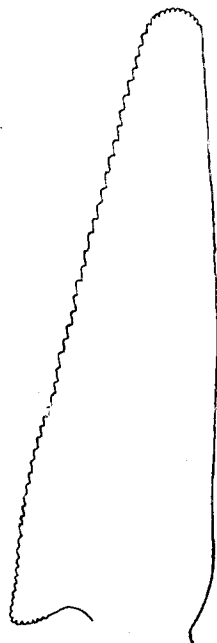


FIG. 3.

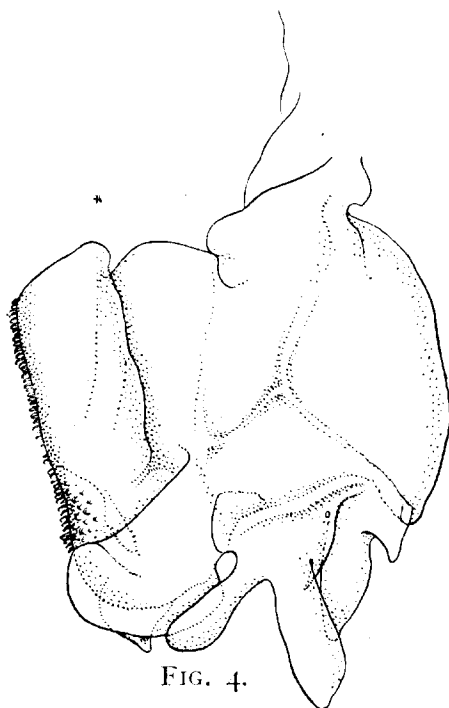


FIG. 4.

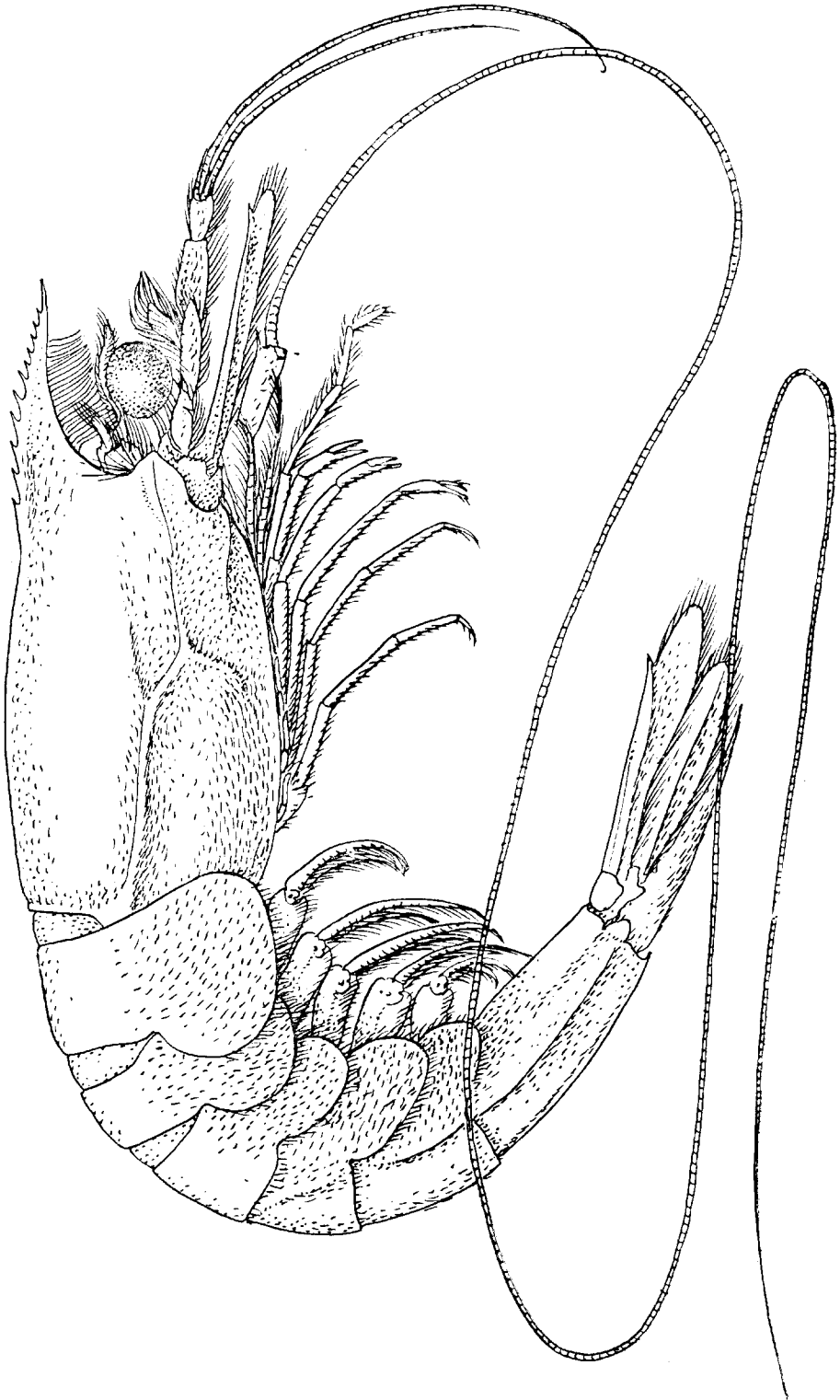


FIG. 5.

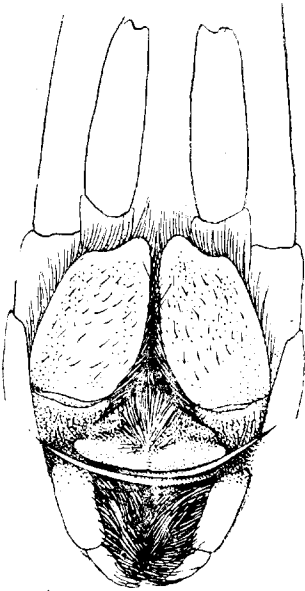


FIG. 7.

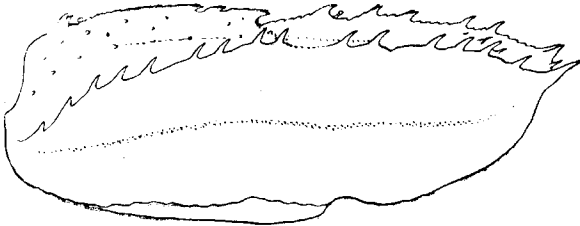


FIG. 9.

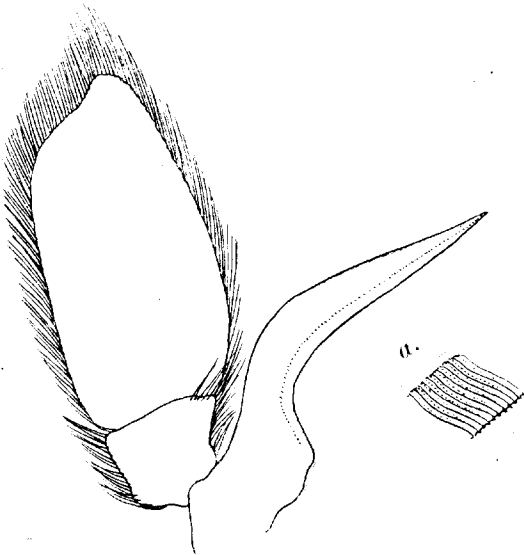


FIG. 6.

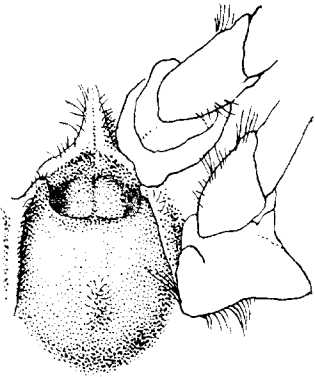


FIG. 8.

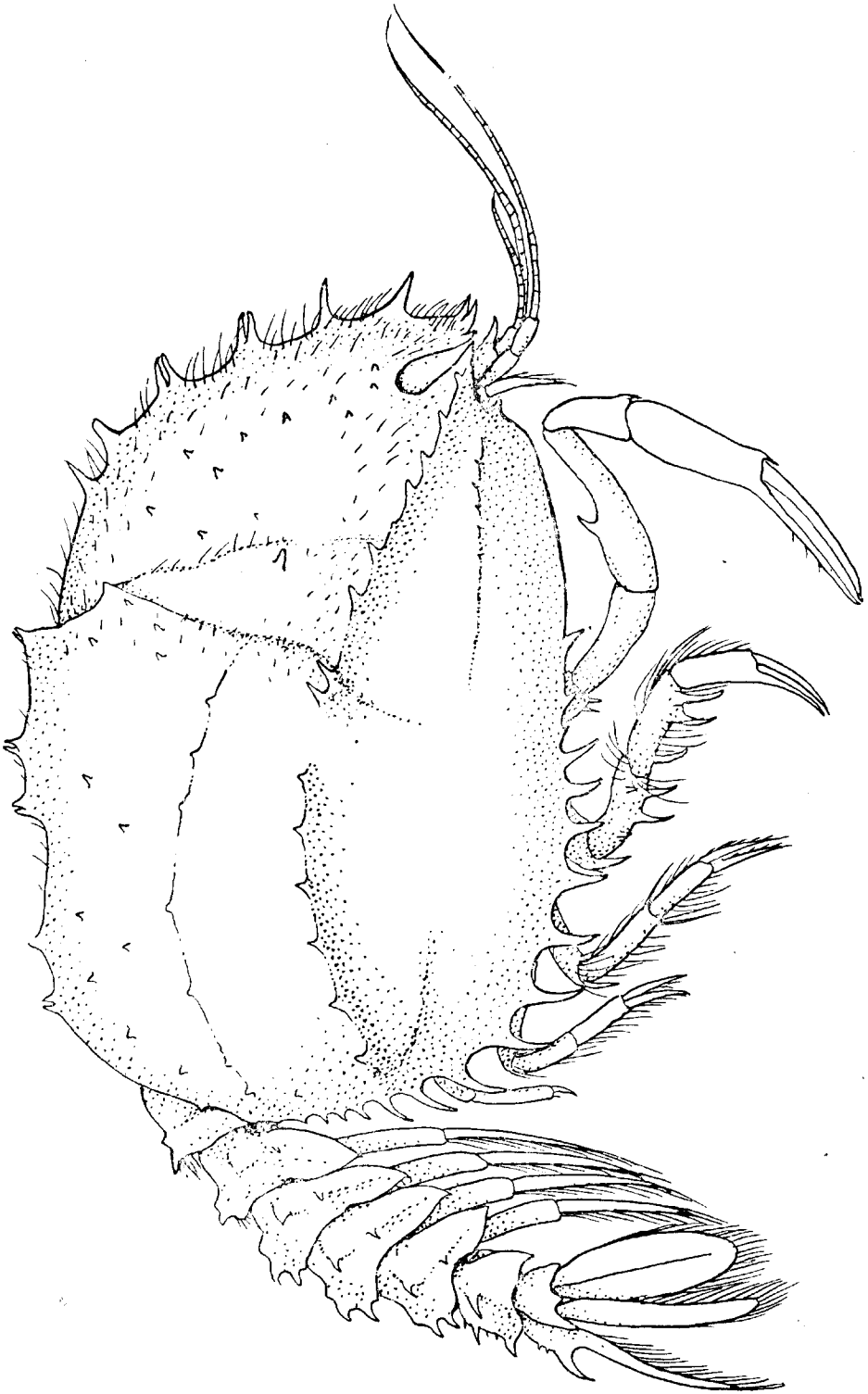


FIG. 10.