

Uropod tapering, inner margin straight, outer evenly convex, setose ramus very small, tipped with a spine and setules; the presence or absence of a second, concealed, ramus could not be determined owing to the impossibility of removing the dirt.

*Length*: ♂ 5.5 mm., ♀ 6.25 mm.; *breadth*, ♂ 2.5 mm., ♀ 3 mm.

*Colour*: In spirit dirty pinkish, eyes reddish.

*Locality*: Walker Point (near Knysna) NE. by N.  $\frac{1}{2}$  N., distant 7 miles. 47 fathoms. ♂♂, ovigerous ♀♀ and juv.; Knysna Heads N., distant 10 miles. 52 fathoms. ♂♂, ♀♀ and juv.; Cape Seal W. by N.  $\frac{1}{2}$  W., distant 7 miles. 39 fathoms. 1 ♀; Agulhas Bank (without more exact locality, depth or date). 1 ♂, 5 ♀♀. s.s. "Pieter Faure." 11/19/00, 2/7/02 and 20/4/06. (S.A.M., Nos. A3863, A4116, A4188 and A4189 respectively).

#### FAMILY ASTACILLIDAE.

For references see Barnard, Ann. S.A. Mus. vol. 10, pt. 7, p. 206, 1914, and add:

1913. Richardson, 2me Exp. Antarc. franç. Isopodes, p. 14.

It is with great regret that, on the vexed question of the number of marsupial plates in the members of this family, I find myself in opposition to Prof. Kochler. This author (1911, Bull. Inst. oc. Monaco, No. 214) has stated that in all the species examined by him the number of pairs of marsupial plates is *constantly three*. Amongst these species was *Astacilla longicornis* (Sow.).

*A. longicornis* is a common species at Plymouth, and is found both on Hydroids and among the spines of *Echinus esculentus*. I have recently examined nearly 50 female specimens of this species in various stages and in every case I have been able to find *four* pairs of marsupial plates. In the immature nonovigerous stage the pair on the 1st segment are quite as clearly defined as in the ovigerous stage. This pair does not increase in size so much as the 2nd and 3rd pairs and does not take any part in the formation of the actual brood chamber. The two plates overlie the "vibratory plates" of the maxillipeds, and, like these, evidently help to aërate the brood chamber.

In the nonovigerous specimen of *A. mediterranea* mentioned below all 4 pairs of plates are very distinctly seen. They have not reached their full size yet, and the 1st pair embrace the vibratory plates instead of overlapping them.

In this latter specimen the 1st-3rd pairs are very easy to observe (without any dissection), because they are in an early stage of development. They are more sac-like than the fully developed plates and

contain a large amount of coagulated granular matter. At a later stage, as seen in *A. longicornis*, this granular matter becomes greatly reduced and is restricted to the basal and central portion of the plate, which has become very much thinner and is surrounded by a perfectly transparent border. In fact, in the 1st plate of *A. longicornis* by far the greater portion of the plate is transparent. Consequently, I believe, it is due to this transparency and the fact that the plate lies flat against the ventral surface that this 1st pair of plates has been overlooked.

Possibly also the method of preservation may account for it. At any rate, Koehler's statement must be regarded as incorrect.

In *Arcturella corniger* (Stebb.) there are also definitely four pairs of marsupial plates, as I have previously recorded in the description of *A. hirsutus*, which proves to be a synonym of *corniger* (see below). But in the species of *Arcturella* described below I believe there are truly only three pairs of plates present.\*

On a further point also I am obliged to differ from the said author.

The genus *Arcturopsis* was founded to receive certain forms which were closely allied to *Arcturella*, but were said to differ in the presence of a ventral process on the 3rd (or in one species on the 5th) peraeon segment in the ♂. This process was developed to a varying degree, and was stated to occur in no other Astacillid ("il ne se rencontre chez aucun autre Arcturidé"). When describing *Arcturopsis hirsutus* in 1914, I placed it in this genus on account of a small tubercle on the 3rd segment in the ♂, which, though not developed to any such size as in Koehler's species, was evidently homologous.

On revising, however, all the species of Astacillids at my command for the present paper, I found an exactly similar process on the 3rd segment in *Arcturella danmonensis* (Stebb.) and in *Astacilla longicornis*. I then applied to Prof. G. O. Sars to know if such a process was present in the type-species of the genus, *Arcturella dilatata* Sars. Prof. Sars kindly examined his specimens and corroborated my belief that *A. dilatata* did possess a process, albeit only "small, somewhat conical, anteriorly pointing" (Sars. in litt. 5/8/16). He also confirmed my observation of its presence in *A. longicornis*.

Dr. Calman, to whom also I mentioned the matter, kindly examined some species in the British Museum collection with the result that he

\* Note to p. 191 in Hansen, Dan. Ingolf. Exp., iii, 5, 1916. The presence of a 5th pair of marsupial plates in *Arcturus baffini* is rather astonishing in view of the strongly prehensile nature of the 5th peracopods and the position assumed by the body. Hansen found 5 pairs also in two species of *Pleuroprion*; but this is less remarkable as this genus is more Idoteid in shape.

confirmed Sars' report of the presence of a process in *A. dilatata* and also in *Arcturus baffini*; "but it is so small in the latter case that it can hardly be regarded as of systematic importance" (Calman in litt. 31/7/16). Calman states that it is absent in *Antarcturus antarcticus* and *meridionalis*. It is also absent in the specimens I described in 1914 as the male of *Antarcturus kladophoros* Stebb., in *Astacilla bacillus* n. sp. and in the only two of the new species assigned to *Arcturella* of which the male is known.

It seems, therefore, that no great importance can be attached to the presence or absence of such a process, and that it cannot be used to delimit the genera in this family. But its presence in *Arcturella dilatata* renders unnecessary the genus *Arcturoopsis*, which must therefore sink into synonymy.

But Koehler described one species in which the process was on the fifth segment—namely, *A. melitensis*; he did not, however, think that a new genus was necessary for this species and so placed it in *Arcturoopsis*. On the contrary, I think he might well have instituted another genus for it, and I propose here, since *Arcturoopsis*, void ab initio, cannot be used, the name—

#### ARCTOPSIS n.g.

Like *Arcturella* Sars, but with a ventral process on the fifth peraeon segment in the male.

One species: *A. melitensis* (Koehler) 1911.

#### GEN. ASTACILLA Cordiner.

1795. *Astacilla* Cordiner, Singular Subjects of Nat. Hist. sect. Astacillae.  
 1893. „ Stebbing, Hist. Crust. p. 370.  
 1897. „ Sars, Crust. Norw. vol. 2, p. 87.  
 1901. „ Ohlin, Svenska Exp. Magellan, vol. 2, p. 266.  
 1905. „ Stebbing in Herdman's Ceylon Pearl Fish. Suppl. Rep. 23, p. 46.  
 1905. „ Richardson, Bull. U.S. Nat. Mus. No. 54, p. 323.  
 1911. „ Koehler, Bull. Inst. oc. Monaco, No. 214, pp. 1, 44, etc.  
 1914. „ Vanhöffen, Deutsche Südpol. Exp. vol. 15, pt. 4, p. 523.

#### ASTACILLA BACILLUS n. sp.

Body perfectly smooth, non-granular, nonsetose. Limits of head and peraeon segment 1 scarcely visible. Eyes horizontally pear-

shaped, narrowing posteriorly. Antero-lateral angles of 1st peraeon segment subacute. Peraeon segments 2 and 3 subequal. Peraeon segment 4 in ♂ exceedingly elongate and slender, a little over half the total length (11 mm.), in ♀ moderately slender, a little less than half the total length (4 mm.), the antero-lateral angles slightly projecting. Segment 5 larger and deeper than segments 6 and 7, which are subequal. No ventral process on either 3rd or 5th segment in ♂.

Pleon longer than last 3 peraeon segments together, composed of 2 short segments in advance of the telson, which has an angular tooth on the lateral margin and a subacute apex.

Antenna 1, 2nd and 3rd joints both shorter than 1st, flagellum longer than peduncle.

Antenna 2, flagellum 2-jointed, with terminal unguis, lower margin with one row of denticles situate on inner side.

Peraeopod 1 geniculate between 2nd and 3rd joints, 3rd and 4th joints subequal, 5th equal to 3rd plus 4th, 6th a little shorter than 5th, 7th short without unguis but tipped with setae, 5th and 6th densely setose.

Peraeopods 2-4 increasing in length, projecting straight in front, not geniculate, 4th and 5th joints subequal, 6th a little longer, all three with long plumose setae.

Three pairs of marsupial plates. The inset-piece of that on the 4th segment can here scarcely be called an "inset" piece for it is equal in length to  $\frac{1}{4}$  of the total length of the plate, subtriangular in shape, and separated from the main portion by a slightly angular suture, nonsetose. The plate is probably not fully developed, but any further development would probably affect only the transverse width and not the relative lengths of the anterior and posterior margins.

Male appendage on 1st pleon segment narrow-pyriform, tapering to an acute apex.

Pleopod 1, peduncle with 4 hooked spines on middle of inner margin, rami subequal, not modified in ♂.

Pleopod 2 in ♂, stylet half as long again as ramus, stout as far as apex of ramus and then narrowing rapidly to the deeply bifurcate apex.

Uropod, concealed ramus with 2 apical setae.

*Length*: ♂ 20 mm., ♀ 10 mm.; *breadth*: ♂ 1 mm., ♀ 1 mm.

*Colour*: In spirit pale yellowish, eyes reddish.

*Locality*: Walker Point, NE. by N.  $\frac{1}{2}$  N., distant 7 miles (off Knysna). 47 fathoms. 1 nonovigerous ♀; O'Neil Peak, NNW.  $\frac{1}{4}$  W.,



distant 8 miles (Zululand). 55 fathoms. 1 ♂. s.s. "Pieter Faure." 11/10/00 and 28/2/01. (S.A.M. Nos. A3862 and A4129.)

This species is named after the extraordinarily slender form of the male. I see no reason to doubt that the male and female are conspecific.

The structure of the marsupial plate on the 4th segment is quite different from that of *A. longicornis*, *deshayesii* or *mediterranea* as figured by Koehler.

#### ASTACILLA MEDITERRANEA Koehler.

1911. *Astacilla mediterranea* Koehler, l.c., p. 44, figs. 25-29.

The single female agrees so well with Koehler's description that I think there can be no doubt as to the specific identity. In one or two details there is a slight difference, and in one point a comparison is not possible because Koehler does not mention it. A future comparison of South African specimens with the types may therefore possibly lead to the former being separated as a *variety*, though scarcely I think as a new species.

In the first place there are scarcely any setules developed on the tubercles, in which connection see the remarks on the variability of a similar feature in *Arcturella corniger* infra. The tubercles on the head and 1st peraeon segment curve gently forwards. The tubercle on the 3rd peraeon segment is much smaller than in Koehler's figure, and there is in addition a similar, though even smaller, tubercle on the 2nd segment; both these tubercles curve backwards and are merely the slightly more developed forms of the granules or "squamules" which are distributed generally over the whole surface.

The median tubercle on the 4th segment is not symmetrical in profile as in Koehler's figure, but has a more gradual anterior, a steeper and more abrupt posterior, slope. Of the posterior median tubercle (anterior to the one on the posterior margin) only one is developed, and that immediately in front of and almost contiguous with the large one on the posterior margin. On either side of this latter tubercle, *i. e.* on the upper postero-lateral angles of the segment, is a small conical process which may correspond with that which Koehler describes as on the *inferior* angle.

Secondly, the point on which Koehler is silent: the lateral margin of the 4th segment is slightly turned out horizontally instead of continuing in the same plane as the rest of the segment, forming a very shallow groove which is quite smooth and free from granules. On the margin itself, however, is a very regular row of granules, and

a further similar row runs along the extreme upper margin of the side-plate.

Assuming that these two rows are absent in the Mediterranean form, this feature and the conical processes on the posterior margin would seem to be a valid reason for giving a varietal name to the South African form.

Eyes subtrigonal rather than oval.

Flagellum of antenna 2-3-jointed; 3rd joint very small, without any row of denticles along the lower margin. In Koehler's specimens the flagellum was serrulate.

Four pairs of marsupial plates, that on the 1st segment very distinct and almost as large as those on segments 2 and 3, which have probably not reached their full development, that on segment 4 also not fully developed since in the anterior part they scarcely meet in the middle line, but posteriorly they are fused in the middle line so that the presence of an inset-piece is not determinable.

The specimen contains several irregular masses of yolk-granules representing maturing ova, and shows in the appendages the new skin developing under the old, so that the next moult will see the full development of the marsupial plates.

*Length*: 7.5 mm.; *breadth*: 1 mm.

*Colour*: In spirit yellowish, eyes reddish.

*Locality*: Umkomaas River, NW. by W.  $\frac{1}{2}$  W., distant 5 miles. 40 fathoms. 1 nonovigerous ♀ on the Gorgonacean *Villogorgia mauritiensis* Ridley. s.s. "Pieter Faure." 31/12/00. (S.A.M. No. A4144.)

*Geogr. Distribution*: Villefranche, Mediterranean (Koehler).

#### GEN. ARCTURELLA Sars.

1897. *Arcturella* Sars, Crust. Norw. vol. 2, p. 92.

1904. ,, Norman. Ann. Mag. Nat. Hist. (7), vol. 16, p. 448.

1908. ,, Stebbing, S. A. Crust. pt. 4, p. 51.

1911. ,, Koehler, l.c. pp. 4, 39.

1911. *Arctuopsis* id. *ibid.* p. 8.

Reasons have already been given for merging *Arctuopsis* in the earlier *Arcturella*. There seems to be no essential difference between them unless one considers the relative lengths of the 4th segment in the male; in *A. dilatata* and *danmonensis* it is not longer than the rest of the body posterior to it, though it varies somewhat, being much shorter in the former, but in the latter only a little shorter, or even, in one Plymouth specimen I have seen, equal to the rest of the body

behind it. In Koehler's species of *Arcturopsis*, on the other hand, the 4th segment is greatly elongate, exceeding in length the rest of the body behind it. Opinions may differ as to this being of generic importance, but it seems scarcely necessary to consider it so, for there always remains the possibility of discovering transitional forms. In fact *lineata* and *corniger* are examples, the former having the 4th segment equal to, the latter a little longer than, the posterior portion of the body.

Sars' definition must be slightly modified; flagellum of antenna 2 1-3-jointed, with 2 rows of denticles on the lower surface; 3rd peraeon segment in male with (typically), but sometimes without, a ventral process, when present more or less strongly developed; outer ramus of pleopod I in male not modified.

In the course of studying the specimens belonging to this genus, I have been confronted in one case with a difficulty similar to that which arose in the case of the genus *Cymodoce*, namely that of correlating the male and female. The facts were as follows:

A ♂ and ♀ were taken from a bottle, P.F. No. 15817, the contents of which were all dredged on the same day and in the same spot. These were the only Astacillids taken in that haul, and would be regarded as conspecific under the usual working hypothesis and unless evidence to the contrary were forthcoming.

In fact this ♂ agrees perfectly in structure with the ♂♂ here assigned to *lineata* which were taken in association with the ♀♀ entirely different from the ♀ from bottle 15817. Since then it is better to presume that the sexes are similar rather than dissimilar, even in a family in which sexual dimorphism is a common phenomenon, the following morphological reason points against the ♂ and ♀ from bottle 15817 being conspecific; the ornamentation of the 4th peraeon segment in the ♂♂ and ♀♀ of *lineata*, taken in the same haul, consists in both cases of 2 mediodorsal tubercles.

#### *Key to the South African Species of Arcturella.*

a. Width of 4th peraeon segment in ♀ less than length, in ♂ very much less. Body in both sexes subcylindrical.

Flagellum of antenna 2, 2- or 3-jointed.

- i. A small ventral process on 3rd segment in ♂. Body in ♀ normally hirsute and strongly tuberculate . . . *corniger* (Stebb.).
- ii. No ventral process. Body in ♀ glabrous and feebly tuberculate . . . *lineata* (Stebb.).

B. Width of 4th segment in ♀ greater than length. Body in both sexes depressed. Flagellum of antenna 2 1-jointed.

i. Segment 4 in ♀ tuberculate . . . . . *pustulata* n. sp.

ii. Segment 4 in ♀ not tuberculate.

a. Outer margin of 2nd joint of antenna  
2 entire. Peraeopod 5 (in ♀ at least)  
with 2nd joint longer than all the other  
joints together . . . . . *longipes* n. sp.

b. Outer margin of 2nd joint of antenna  
2 notched. Peraeopod 5 with 2nd joint  
shorter than all the rest together . . . . . *brevipes* n. sp.

ARCTURELLA CORNIGER (Stebb.).

1873. *Arcturus corniger* Stebbing, Ann. Mag. Nat. Hist. (4), vol. 12,  
p. 96 (♀).

1908. *Arcturella* (?), id. l.c. p. 51.

1913. *Aantarcturnus ornatus* Tattersall, Tr. Roy. Soc. Edinb. vol. 49,  
pt. 4, p. 889, pl., fig. 5 (♀).

1914. *Arcturus* (?) *corniger* Barnard, Ann. S.A. Mus. vol. 10, pt. 7,  
p. 207.

1914. *Arcturoopsis hirsutus* id. ibid. p. 207, pl. 19A (♂ ♀).

At the time I described *A. hirsutus* I was not aware of the publication of Tattersall's paper, and in comparing the species with Stebbing's *corniger* I pointed out certain characters which then seemed to me to distinguish the two species. Further examples have since been discovered among the "Pieter Faure" collections which enables me to establish the above synonymy.

In the first place a comparison of the figures of *ornatus* and *hirsutus* leaves no doubt that they are conspecific.

Secondly, the new material shows the extreme variability of the dorsal tubercles and setae on the 4th peraeon segment of the ♀, thus affording a series uniting all three forms.

Setae in ♀ seem to be normally present, though varying in quantity, but frequently the body is perfectly glabrous. The anterior median tubercle is not as large in any of my specimens (except one from Sebastian Bluff) as in Stebbing's example, but is usually present, though absent in the specimens described as *hirsutus*. The apices of all the tubercles vary from pointed to blunt. The three posterior tubercles show the greatest amount of variation. They may be low, rounded-topped knobs, or moderately high blunt tubercles or high spini-form projections. This last form is shown in the figure of *hirsutus*,

but may reach an even greater development; *ornatus* shows a very moderate development of tubercles. Or again, the two tubercles on the posterior margin may coalesce to form a rounded transverse ridge which occasionally develops a third (median) tubercle between the two normal ones.

The tubercle on the 1st segment is usually more prominent than those on the 2nd and 3rd segments.

In the specimen from Sebastian Bluff the two posterior tubercles on the head are equal in height to the length of the head, but normally all 4 tubercles are not at all prominent.

The tubercles on the 4th marsupial plate vary from 2 to 7.

The flagellum of antenna 2 in both sexes has 2 rows of denticles on the under surface, not only the one on the inner margin as in my original description. Tattersall could not see any in his specimen of *ornatus*, but I think they must have been present; they are rather difficult to make out sometimes, especially the row on the *outer* inferior margin. The suture between the 2nd and 3rd joints is also very obscure sometimes, the third joint appearing to consist merely of the apical tooth or unguis.

The male appendage, which I described as situate on the 7th peraeon segment, is really on the 1st pleon segment.

Of the variety *subglaber* no further examples have come to light. Nor have I found any transitional forms between this and the typical form, so that I still keep it as a variety.

*Additional Localities:* Bakkoven Rock NW. by W., distant 2 miles (False Bay). 24 fathoms. 2 ♂♂, 3 ♀♀; Walker Point (near Knysna). NE. by N.  $\frac{1}{2}$  N., distant 7 miles. 47 fathoms. 10 ♂♂, 3 ♀♀; Sebastian Bluff W. by N.  $\frac{3}{4}$  N., distant 6 miles. 28 fathoms. 1 ♀. s.s. "Pieter Faure." 11/11/02, 11 10/00 and 5/7/00. Also several ♂♂ and ♀♀ from the previously recorded locality off Robben Island.

#### ARCTURELLA LINEATA (Stebb.).

1873. *Arcturus lineatus* Stebbing, Ann. Mag. Nat. Hist. (4), vol. 12, p. 97, pl. 3A, fig. 3 (♂).

1875. .. .. id. *ibid.* (4), vol. 15, p. 187.

1914. .. (?) .. Barnard, Ann. S.A. Mus. vol. 10, pt. 7, p. 207.

Body glabrous, minutely granular in ♂, subcylindrical. Head not broader than long, antero-lateral processes rounded with a point on outer margin near apex, surface smooth. Peraeon segments 2 and 3 slightly widening in ♀; segment 4 much longer than wide, in ♂ 18:8,

in ♀ 12:8, in ♂ coffin-shaped, with a small medio-dorsal tubercle in the anterior half and another near the posterior margin, the latter hook-shaped and pointed backwards, some granules larger than the rest along the lateral margins, in ♀ slightly wider anteriorly than posteriorly, sides nearly straight, a low rounded medio-dorsal tubercle in the anterior half and another on the posterior margin, the posterior margin itself somewhat thickened and elevated; segments 5 and 6 with rounded side-plates only partly visible in dorsal view, segment 5 in ♂ with a small median tubercle on both anterior and posterior margins, segment 6 in ♂ with one on the posterior margin only, segment 7 with subacute side-plates.

Pleon segments 1-3 slightly widening, but 3 not laterally projecting, its posterior margin distinctly trilobed, telson tapering to a truncate apex.

Antenna 2, 2nd joint toothed on outer margin, 3rd and 4th in adult ♂ tuberculate on inner lower surfaces, 1 or 2 tubercles also on 5th, this latter joint in ♀ with very minute denticles on lower inner margin; flagellum 2-jointed, with 2 rows of small denticles on lower surface.

Peraeopods 2-4 relatively long.

Peraeopod 5, 2nd joint scarcely equal to width of segment 4 and shorter than all the other joints together.

Marsupial plates, three pairs, inset piece of that on 4th segment extending along whole posterior margin, setulose.

Male appendage on pleon segment 1 apically blunt.

Pleopod 2, male stylet half as long again as ramus, rather stout, apex deeply bifurcate in adult, acute in immature specimens.

Concealed ramus of uropod with 3 setae.

*Length*: ♂ 11 mm., ♀ 9 mm.; *breadth*: ♂ and ♀ 1.5 mm.

*Colour*: In spirit, largest specimen yellowish, eyes reddish; other specimens pinkish-brown or whitish, covered with minute dark pigment-specks, eyes reddish or black.

*Locality*: False Bay. 1 juv. ♀ on *Gorgonia flamma*; (?) Agulhas Bank. 1 ovigerous ♀ and 2 juv. ♀♀ on *Gorgonia albicans*. (L. J. Irvine.) 1915; Algoa Bay. 20 fathoms. 1 ♂; 34° 19' S., 25° 52' E. 100 fathoms. 1 ♂, 2 juv. ♂♂, 3 ovigerous and 1 juv. ♀♀; False Bay. 22 fathoms. 1 ♂. s.s. "Pieter Faure." 12/12 98, 1/11/98 and 30/10/02. (S.A.M. Nos. A3072, A4140, A4141, A4142 and A4059 respectively.)

Stebbing received his specimen from Port Elizabeth.

In this species there is some variation, albeit slight, in the development of the dorsal tubercles, especially on segments 5 and 6 in ♂;

in some specimens these are quite distinct and pointed, in others blunt and very indistinct.

The ♂ of this species closely resembles in general appearance that of *A. corniger*, but may be easily distinguished by the absence of any ventral process on the 3rd peraeon segment and by the hook-like shape of the posterior tubercle on the 4th segment.

ARCTURELLA PUSTULATA n. sp.

(Plate XVI. Fig. 24.)

Female.—Body glabrous, moderately depressed. Head wider (across the eyes) than long, antero-lateral angles subacute, with a minute point in the middle of outer margin, front margin strongly concave, dorsal surface quite smooth. Eyes large, oval. Peraeon segment 1 without visible suture separating it from the head; segments 2 and 3 gradually widening; segments 1–3 quite smooth; segment 4 wider (across the anterior margin) than long, lateral margins not greatly expanded, nearly straight, converging posteriorly, smooth except for the tubercles in the posterior half, which are arranged thus: 2 in each of the postero-lateral angles, a small one immediately in front of a larger one, a little in front of these 2 large submedian tubercles, the extreme postero-lateral angles also bluntly tubercular; side-plate on segment 4 quadrangular.

The relative development of the tubercles, however, is subject to some variation as in *corniger*. The 10 mm. long ovigerous ♀ No. A4145 has only very faint traces of the 2 submedian tubercles, and the smaller postero-lateral ones are entirely absent, whereas the pair of large ones is strongly developed, being at least  $\frac{1}{2}$  mm. in height.

Young specimens up to 7 mm. are quite smooth dorsally. A specimen 8 mm. long shows the 2 submedian tubercles and the 2 large postero-lateral ones; another also 8 mm. long shows only the 4 postero-lateral tubercles.

The tubercles are low and rounded; even when strongly developed they are apically blunt.

Segment 5 longer than either 6 or 7; side-plates on these 3 segments pendulous, not completely visible in dorsal view.

Pleon with the first 3 segments very slightly wider than the telson, the 3rd not laterally prominent, all the sutures very indistinct, telson without any lateral teeth or projections, apex subacute, shallowly notched.

Antenna 2, 2nd joint with strong tooth on outer margin, 5th with a row of very minute denticles along lower inner margin, flagellum of

a single joint, with 2 rows of denticles along the lower margin, that on inner side containing a larger tooth about half-way along, a large stout tooth on the lower margin at base of the terminal unguis.

Peraeopods 2-4 relatively long, apex of 5th joint of peraeopod 4 nearly reaching apex of antero-lateral angle of head.

Peraeopod 5, 2nd joint  $\frac{2}{3}$  length of segment 4, shorter than all the other joints together.

Three pairs of marsupial plates, that on 4th segment with a setulose inset-piece extending nearly the whole length of the posterior margin.

Concealed ramus of uropod with 5 unequal setae.

*Length*: Oviparous ♀ 8.25-10 mm.; *breadth*: 2.25 mm.

*Colour*: In spirit yellowish or pinkish, eyes dark reddish.

*Locality*: Unkomaas River NW. by W.  $\frac{1}{2}$  W., distant 5 miles. 40 fathoms. 1 oviparous ♀ on the Gorgonacean *Villogorgia mauritiensis* Ridley; Durnford Point NE. by E., distant 9 miles. 13 fathoms. 12 juv. ♀♀. s.s. "Pieter Faure." 31/12/00 and 8/2/01. Natal coast. 6 fathoms. 1 oviparous ♀, 3 juv. "on coral." (H. W. Bell-Marley.) May, 1917. (S.A.M. Nos. A4145, A4143 and A4567.)

ARCTURELLA LONGIPES n. sp.

(Plate XVI. Figs. 25, 26.)

Body glabrous, minutely shagreened, greatly depressed, especially in ♀. Head, together with peraeon segment 1, as wide as long, the lateral projections not produced beyond the antero-lateral point, dorsal surface with 2 small acute tubercles between the eyes in ♂, smooth in ♀. Eyes large, oval. Peraeon segment 1 with moderately distinct suture separating it from head; segments 2 and 3 widening gradually in ♀, segments 1-3 apparently each with a small median tubercle in ♂, but these portions rather bruised, smooth in ♀; segment 4 longer than broad (10:8) in ♂, broader than long in ♀ (width equal to combined length of segments 3 and 4), in ♂ oblong with equal posterior and anterior margins and nearly straight sides, smooth except for one median hook-like tubercle near the posterior margin, directed backwards, in ♀ anterior margin greater than posterior, sides slightly sinuous, entirely smooth; side-plate of segment 4 in ♀ projecting forwards as an acute point; segment 5 not greatly larger than 6 or 7, 5 and 6 with rounded side-plates completely visible in dorsal view, 7 with subacute postero-lateral angles, all 3 segments smooth in both sexes.

Pleon with first 3 segments widening gradually, 3rd projecting



laterally beyond telson, which tapers to a narrow truncate apex, without lateral teeth, dorsal surface smooth.

Antenna 2, 2nd joint with an entire straight outer margin, lower margins of 3rd–5th joints not tuberculate in ♂, flagellum of a single joint with terminal unguis, lower margin with 2 rows of denticles, with a slightly larger denticle at the base of the unguis in ♀ only.

Peraeopods 2–4 relatively long, especially in ♀, 5th joint reaching the lateral process of head.

Peraeopod 5, 2nd joint in ♀ equal to length of segment 4, longer than all the other joints together, in ♂ lost; peraeopods 5–7 with a small setiferous elevation in the middle of hind margin of 2nd joint, most marked on peraeopods 6 and 7, especially in ♂.

Three pairs of marsupial plates, that on 4th segment with setulose inset-piece extending nearly the whole length of posterior margin.

Pleopods 1 and 2 and male appendage mutilated.

Concealed ramus of uropod with 3 setae in ♂, 3–4 in ♀.

*Length*: ♂ 10 mm., ♀ 9 mm.; *breadth*: ♂ 2 mm., ♀ 2.5 mm.

*Colour*: In spirit yellowish, eyes reddish or black.

*Locality*: Table Bay, 22 fathoms. 1 somewhat bruised and mutilated ♂; Cape St. Francis NE., distant 29 miles. 75 fathoms. 1 ovigerous ♀. s.s. "Pieter Faure." 5/3/00 and 19/2/02. (S.A.M. Nos. A3830 and A4058.)

This species is easily distinguished from the other species by the unnotched 2nd joint of antenna 2, the 2nd joints of peraeopods 5–7 and the laterally projecting 3rd pleon segment, also the acute side-plate on segment 4 in the ♀.

#### ARCTURELLA BREVIPES n. sp.

(Plate XVI. Fig. 27.)

Female.—Body glabrous, very faintly shagreened, greatly depressed. Head wider than long, lateral processes rounded, with a small point on outer margin near the apex, dorsal surface smooth. Eyes large, oval. Peraeon segment 1 with very indistinct suture separating it from head; segments 2 and 3 gradually widening; segment 4 much wider than long, width across anterior margin being equal to length of segments 1–4 together, narrower posteriorly, sides distinctly sinuous, surface smooth; segments 5 and 6 with rounded side-plates; segment 7 with subacute side-plates; all the segments smooth.

Pleon segments 1–3 very slightly wider than telson, 3rd not projecting laterally, telson tapering to a subacute truncate apex.

Antenna 2, 2nd joint toothed on outer margin, 5th joint smooth, flagellum of a single joint, its lower margin with 2 rows of denticles and a larger tooth at base of unguis.

Peraeopods 2-4 short, 6th joint (not 5th) of peraeopod 4 reaching beyond eyes.

Peraeopod 5, 2nd joint about  $\frac{2}{3}$  length of segment 4, but shorter than the other joints together.

Three pairs of marsupial plates, that on 4th segment with setulose inset-piece extending nearly whole length of posterior margin.

Concealed ramus of uropod with 4 setae.

Length: 9 mm.; breadth: 3 mm.

Colour: In spirit yellowish, eyes reddish.

Locality: ? Agulhas Bank. 3 ovigerous and numerous juv. ♀♀ on *Gorgonia albicans* (J. L. Irvine). 1915; False Bay. 22 fathoms. 1 ovigerous ♀. s.s. "Pieter Faure." 30/10/02. (S.A.M. Nos. A3884 and A4139.)

This species is named in allusion to the most easily noticeable difference between it and the preceding species.

#### GEN. NEOARCTURUS Brnd.

1914. *Neoarcturus* Barnard, Ann. S.A. Mus. vol. 10, pt. 7, p. 213.

The discovery of the female shows that this genus is remarkably close to *Arcturus*, differing only in the composition of the pleon and the 3-jointed flagellum of antenna 2.

#### NEOARCTURUS OUDOPS Brnd.

1914. *Neoarcturus oudops* Barnard, l.c. p. 214, pls. 18c and 19b.

The original description was based on a single male and is confirmed by an examination of the present specimens except in one point: the male appendage was stated to be on the 7th peraeon segment, whereas really it is on the 1st pleon segment.

The female differs in no way from the male except in being broader across peraeon segments 2-4; segment 4 is not longer than the others. The sculpturing is the same, but more prominent than in the male, especially the lateral tubercles on the posterior ridges.

Maxilliped like that of ♂, without vibratory plate.

Peraeopod 2, 2nd joint a little longer than 4th joint.

Three pairs of marsupial plates. Side-plates on segments 2-4 produced backwards and downwards as acute processes supporting the marsupial plates.

Pleopod 1, peduncle with two hooked spines on inner margin and

several denticles on outer, outer ramus a little longer than peduncle, elongate-ovate, apex blunt, inner ramus as long as peduncle and half the width of outer ramus, narrow, apex subacute, apices and outer margin of both rami setose.

Pleopod 2, rami subequal, elongate-oblong, apices rounded-truncate, setose.

*Locality*: Cape Point N. 89° E., distant 36 miles. 700 fathoms. Several ♂♂ and ♀♀ with embryos. s.s. "Pieter Faure." 20/8/03. (S.A.M., No. A4070.)

Although not remarked upon in my original description, this species bears an extraordinary resemblance to *Arcturus myops* Beddard (1886, *Challeng. Rep.* vol. 17, p. 100, pl. 22, figs. 5-8, pl. 25, fig. 8) from 700 fathoms off New Zealand. The two species agree in having only low rounded elevations, unpigmented and unfacetted, in place of eyes and in the sculpturing, but are easily distinguished by the shape of the telson.

## FAMILY STENETRIIDÆ.

1905. *Stenetriidae* Hansen, *Proc. Zool. Soc. Lond.* 1904, vol. 2, pt. 2, p. 315.

### GEN. STENETRIUM Haswell.

1881. *Stenetrium* Haswell, *Proc. Linn. Soc. N.S.W.* vol. 5, p. 478.  
 1905.     ,,     Hansen, *l.c.* pp. 303, 316.  
 1906.     ,,     Nobili, *Mem. Ac. R. Torino*, ser. 2, vol. 57, p. 414.  
 1914.     ,,     Barnard, *Ann. S.A. Mus.* vol. 10, pt. 7, p. 217.  
 1914.     ,,     Vanhöffen, *D. Südpolar Exp.* vol. 15, pt. 4, p. 546.

Up to the present time only one species of this genus has been known from South Africa—*S. crassimanus* Brnrd. Four additional species are described below, so that the genus is now as well represented in South Africa as in the West Indies.

Moreover, in examining these latter species, I have become aware of a character which is common to all five species, although I had overlooked its presence in *crassimanus*—namely, a median longitudinal ventral keel on all the peraeon segments in both sexes. There is no mention of such a keel in the descriptions of any of the other species, but it would be scarcely correct to presume its absence, for it may not have been considered important enough for the diagnosis of the species. In the South African species, however, there are slight differences which are enough to separate the species without referring to other characters.

The four species here described are named after four Portuguese navigators famous in early Cape history.

STENETRIUM DAGAMA n. sp.

(Plate XVI. Figs. 28 and 29.)

Body with a few long scattered hairs, chiefly on the lateral portions. Antero-lateral angles of head acute, not incurved, rostrum broader than long, antero-lateral angles rounded-quadrangle, anterior margin straight. Eyes narrow oblong, curved.

First peraeon segment scarcely longer than second, its antero-lateral angles fairly prominently produced, acute. Ventral keel raised into a rather high process on segments 1-4, acute on 1st, rounded on 2-4, keel not so high on segments 5-7, the posterior angles acute, denticiform. The anterior processes are not so strong in the female, but otherwise the keel is similar.

Pleon about as broad as long, lateral margin with only one tooth, distal margin obscurely trilobed, the median lobe more prominent, subacute.

First antenna. 1st joint largest, 2nd shorter than 3rd, flagellum composed of ca. 15 joints indistinctly separated.

Second antenna. outer apex of 1st joint acute, but not produced or denticiform, with 2-3 setae, 3rd joint longer than 1st plus 2nd, scale broadly ovate, apically setose, 4th very short, 6th a trifle longer than 5th, flagellum longer than peduncle, with many indistinctly separated joints.

Mouth-parts as described for *crassimanus*; upper lip distally feebly emarginate, spine-row with 8 serrate spines in left mandible, ca. 18 in right, 2nd joint of maxilliped not so long, 6th less abruptly narrower than 5th, epipod reaching to middle of 5th, inner plate with 5 coupling-hooks.

First peraeopod ♂, all joints densely clothed with long setae, 3rd and 4th joints strongly produced anteriorly, the apices, however, not very acute, 5th not produced, 6th subtriangular, greatest width equal to length; hind margins scarcely more than  $\frac{1}{2}$  length of palm, which is crenulate, with 2 more distinct teeth near the hinge and a fringe of regularly spaced spinules; a large stout spine on the rounded defining angle, finger as long as palm, inner margin regularly spinose. In ♀ similar but smaller.

Second to seventh peraeopods as in *crassimanus*.

First pleopod ♂, peduncle with 2-3 setae at base of each ramus, rami narrow, thrice as long as broad, with marginal setae only and

without the parallel sculpturing found in the other species. Operculum in ♀ tapering to a bifid apex. The other pleopods as in *crassimanus*.

Uropod, outer ramus a trifle shorter than inner, both rami with long simple setae.

*Length*: 7.5 mm.; *breadth*: 2.25 mm.

*Colour*: In spirit yellowish-white, eyes brownish.

*Locality*: Vasco da Gama Peak N. 71° E., distant 18 miles (off Cape Point). 230 fathoms. 4 ♂♂, 6 ♀♀ (with ova and embryos) among the outer spicules of an Hexactinellid sponge (*Pheronema*); Table Mountain S. by E.  $\frac{3}{4}$  E., distant 58 miles. 190 fathoms. 2 ♂♂ amongst siliceous sponges. s.s. "Pieter Faure." 4/5/00 and 3/4/02. (S.A.M. Nos. A2855 and A4075.)

In the key given by Hansen (l.c. p. 316) this species comes under B.a.β.; the form of the first peraeopod is somewhat similar to that of *siamense* Hansen, but the absence of lateral projections of the head in this latter species offers a ready mark of distinction.

#### STENETRIUM DALMEIDA n. sp.

Body nearly smooth, glabrous except for a few isolated setae on the pleon and the antero-lateral angles of the peraeon segments. Head with the antero-lateral angles acutely produced, not incurved, rostrum broader than long, antero-lateral angles quadrate, anterior margin straight. Eyes narrow oblong, curved.

Peraeon segments 1-4 subequal, each with a shallow transverse groove across the middle, antero-lateral angles of 1-3 acutely produced, of 4 quadrate. Ventral keel obsolete on all the segments except 3 and 4, where it forms a blunt process, and on 7, where it forms a backwardly directed spine on the posterior margin.

Pleon very little longer than broad, lateral margin with only one tooth, distal margin arcuate with a fairly prominent acute median lobe.

Antenna 1, 1st joint largest, 2nd shortest, 3rd a little longer than 2nd but more slender, flagellum of 12 joints.

Antenna 2, 1st joint acutely but not strongly produced on outer apex, scale on 3rd ovate, apically setose, 6th a little longer than 5th, flagellum longer than peduncle, multiarticulate.

Mouth-parts normal.

Peraeopod 1 in ♂, 3rd and 4th joints strongly and very acutely produced on outer apex, 5th not produced, 6th sub-triangular, a little broader than long, palm a little oblique with one strong acute tooth in the centre and another near the linge (both teeth lacking in the smaller ♂, 5 mm. long), one small spine on the defining angle, finger

matching palm, lower margin of 5th and 6th moderately setose; the right limb in the largest specimen is smaller and less developed than the left one, having been perhaps regenerated. In ♀ 3rd and 4th joints apically produced, 5th not produced, 6th longer than broad, palm transverse, shorter than hind margin, setose, defining angle a right angle but rounded, with one strong spine, finger matching palm, spinulose.

Pleopod 1, peduncle without setae, outer margins of the rami evenly convex, length of the rami a little more than twice as long as wide, with surface sculpturing but only marginal setae.

Opeculum in ♀ tapering to a subacute entire apex.

Uropods lost.

Length: 7.5 mm.; breadth: 2 mm.

Colour: In spirit pinkish, eyes dark red.

Locality: Lion's Head SE.  $\frac{1}{4}$  E., distant 50 miles (off Cape Peninsula). 230 fathoms. 2 ♂♂; Cape Point NE.  $\frac{1}{4}$  N., distant 18 miles. 135 fathoms. 1 nonovigerous ♀. s.s. "Pietri Faure." 2/4/02 and 27/2.02. (S.A.M. Nos. A4013 and A4121.)

This species is superficially very close to *S. dagama*, but is distinguished by the difference in the ventral keels, the 1st joint of antenna 2, armature of the palm of peraeopod 1, the absence of the dense covering of setae and the very acute apices of the 3rd and 4th joints of the same peraeopod. The 1st peraeopod in the ♀ is also quite different in the two species, on the presumption that the limb in the single ♀ specimen of the present species has reached its full development.

STENETRIUM DIAZI n. sp.

(Plate XVI. Figs. 30-32.)

Body with a few long scattered setae, chiefly on the lateral portions. Antero-lateral angles of head acute, not incurved, teeth forming the inner angles of the sockets for the second antennae somewhat blunt, rostrum broader than long, antero-lateral angles subacute, anterior margin slightly concave. Eyes reniform.

First peraeon segment longer than 2nd, the antero-lateral angles produced forwards to the level of the eyes, acute. Keel on segments 1-4 low, rounded, in each segment surmounted by a small acute denticle, keel on segments 5-7 with the posterior angles in each segment acutely produced.

Pleon about as broad as long, lateral margin with a single tooth, distal margin obscurely trilobed (as in *occidentale* Hansen).

First antenna, 1st joint largest, 2nd and 3rd subequal, each equal to  $\frac{1}{2}$  the 1st. flagellum with 10 indistinctly separated joints.

Second antenna, 1st joint acutely produced to end of 2nd, apex with a denticle and 4 setae, 3rd rather longer than 1st plus 2nd, scale of equal width throughout, 4th very short, 6th a trifle longer than 5th, flagellum longer than peduncle, with many joints.

Mouth-parts as in *crassimanus*; upper lip distally feebly emarginate, spine-row with 6 spines in left mandible, 14 in right, 6th joint of maxilliped less abruptly narrower than 5th, inner plate with 6 coupling-hooks.

First pereopod ♂ elongate, 2nd joint longer than 3rd-5th together, anterior margin with a strong laminar tooth at base in the adult, 3rd anteriorly produced to middle of 4th, 4th likewise produced nearly to end of 5th, 5th not produced, 6th as long as 2nd, oblong, widening very slightly distally, inferior margin slightly sinuous, palm short, transverse, with 2 strong, closely apposed, apically blunt teeth, a smaller tooth near the hinge, defining tooth very strong, apically subacute, palm and hind margin laminar and thinner than rest of joint, as in *crassimanus*, finger projecting beyond defining tooth, inner margin with a few simple spinules, outer margin setose, inferior margins of 4th-6th joints densely setose.

First pereopod ♀ shorter, 2nd joint without basal tooth, 3rd-5th joints as in male, 6th not longer than 3rd plus 4th, oblong, widening distally, width  $\frac{2}{3}$  length, inferior margin straight, palm slightly convex, transverse, nearly as long as inferior margin, with one small tooth in middle, and a series of spinules, defining angle rounded, with one strong spine, finger matching palm, inner margin with serrate spinules, inferior margins of 4th-6th joints densely setose.

Second to seventh pereopods as in *crassimanus*.

First pleopod ♂, peduncle with one pair of small setae, rami broader than in *crassimanus*, widening for  $\frac{2}{3}$  length, then strongly contracting, outer margin thus angular, with surface sculpturing but with marginal setae only. Operculum in ♀ tapering to a bifid apex.

Rest of the pleopods normal.

Uropod, outer ramus shorter than inner, both with long simple setae.

*Length*: ♂ 6 mm., ♀ 5 mm.; *breadth*: ♂ 1.5 mm., ♀ 1.25 mm.

*Colour*: Creamy-white, eyes black.

*Locality*: Buffel's Bay (False Bay), 1 3/15. (K.H.B.) 2 ♂♂, 3 ♀♀ (1 ovigerous), 4 juv. (S.A.M. No. A3309.)

This species comes under A.a. in Hansen's key and is most closely allied to *crassimanus* Brund.

STENETRIUM SALDANIA n. sp.

(Plate XVI. Figs 33 and 34.)

Body with a very few setae on the lateral portions only. A low, broad, rounded dorsal ridge runs throughout the pereon and pleon, most noticeable on the latter but nowhere prominent. Antero-lateral angles of head prominent, acute, not incurved, teeth forming the inner angles of the sockets of the 2nd antenna prominent, acute; rostrum very prominent, longer than broad, tapering to an acute point in ♂, subacute in ♀. Eyes reniform. First segment of pereon scarcely longer than 2nd, antero-lateral angles fairly prominently produced, acute. Keel on segments 1-4 rather high, with the anterior angles dentiform and subacute, posterior apices of keel on segments 5-7 acute, dentiform, that on segment 7 being very prominent, curved backwards, spiniform.

Pleon distinctly longer than broad, lateral margin with a single tooth, distal margin obscurely trilobed.

First antenna, 1st joint largest, 2nd and 3rd subequal, flagellum of 12 indistinctly separated joints.

Second antenna, outer apex of 1st joint acute, but not produced or dentiform, 3rd equal to 1st plus 2nd, scale obovate, apically setose, distal peduncular joints and flagellum lost in both specimens.

Mouth-parts as in *crassimanus*; upper lip distally feebly emarginate, spine-row with 6 spines in left mandible, 12 in right, maxilliped with 6th joint half width of 5th, inner plate with 5 coupling-hooks, epipod reaching to end of 5th joint.

First pereopod ♂ stout, 2nd joint subequal to 3rd-5th together, 3rd and 4th acutely produced but not strongly anteriorly, 5th not produced, 6th only a little longer than greatest width, which is across the nearly transverse palm, palm a little shorter than hind margin, straight, with one pointed denticle in middle and a series of stout serrulate spines, the rounded defining angle with one long stout serrulate spine, finger matching palm, inner margin with serrulate spines, 4th-6th joints moderately setose, inferior margin of 6th rather densely setose. In ♀ similar but smaller and weaker, palm without a denticle.

Second to seventh pereopods as in *crassimanus*.

First pleopod ♂ intermediate between that of *crassimanus* and that of *diazi*, outer margin moderately angular, with surface sculpturing and marginal setae only. Operculum in ♀ tapering to a bifid apex.

Rest of the pleopods as in *crassimanus*.

Uropods lost in both specimens.



*Length*: ♂ 6 mm., ♀ 5 mm.; *breadth*: ♂ 1.75 mm., ♀ 1.5 mm.

*Colour*: In spirit whitish, eyes reddish.

*Locality*: Cape St. Blaize N. by E., distant 73 miles. 125 fathoms. 1 ♂ and 1 nonovigerous ♀; Cape Point NE.  $\frac{1}{4}$  N., distant 18 miles. 135 fathoms. 1 ♀. s.s. "Pieter Faure." 21/12/99. (S.A.M. Nos. A3826 and A4120.)

This species also comes under B.a.β. in Hansen's key, and as regards the first peraeopod might form a separate group with *dagama*. The shape of the rostrum, however, is so different from that of any other species in the genus, excepting *crassimanus*, and, to a lesser degree, *chiltoni* Stebb., that it stands quite apart.

#### STENETRIUM CRASSIMANUS Brnd.

1914. *Stenetrium crassimanus* Barnard, Ann. S.A. Mus. vol. 10, pt. 7, p. 217, pl. 20A.

The ventral keel on the peraeon is slighter than in the 3 species just described. In segments 1 and 2 in ♂ it is raised into a spiniform forwardly directed process, in ♀ only feebly raised, in segments 5-7 the posterior apices are feebly dentiform in both sexes.

The inner plate of the maxilliped was originally stated to have only 3 coupling-hooks; on re-examination of the mounted specimen, however, I find there are 5.

### FAMILY JAERIDAE.

1910. *Jaeridae* Stebbing, J. Linn. Soc. Lond. vol. 31, p. 224 (references).

#### GEN. JANIRA Leach.

1814. *Janira* Leach, Edinb. Encycl. vol. 7, p. 434.

1914. „ Barnard, Ann. S.A. Mus. vol. 10, pt. 7, p. 219 (references), and pt. 11, p. 436.

#### JANIRA ANGUSTA n. sp.

(Plate XVII. Figs. 1-3.)

Male.—Body dorsally smooth, margins with several stiff, moderately long setae, becoming more numerous on the pleon. Head about as broad as long, antero-lateral angles subquadrate, lateral margins entire, anterior margin slightly sinuous with a minute median point. Eyes rather small, ovate, set within the lateral margins, facets few in number.

Peraeon segment 1 longest, antero-lateral angles acute, 2nd segment similar but with the antero-lateral angles not so much produced and

less acute, 3rd and 4th with antero-lateral angles rounded. Posterior 3 segments well distinguished from the anterior ones, the 7th longest, the postero-lateral angles rounded.

Pleon longer than 7th pereaeon segment, longer than broad, oval, slightly tapering distally, lateral margins entire.

Antenna 1 reaching nearly to end of 4th joint of antenna 2. 1st joint largest, 2nd and 3rd together equal to 1st, but not so stout, flagellum 4-jointed, not distinguishable from peduncle.

Antenna 2, 3rd joint with distinct scale, 4th-6th joints subequal, 6th indistinguishable from flagellum, which consists of ca. 18 indistinctly separated joints and is equal to 4th-6th peduncular joints together.

Upper lip rather long, apically rounded.

Lower lip with rather broad lobes, inner apical angles setulose.

Mandibles, cutting-edge 4-dentate, secondary cutting-edge not visible, spine-row apparently absent in left, in right with ca. 8 spines, palp with the 3 joints subequal, 3rd curved and spinulose along inner margin.

Maxillae 1 and 2 as in *J. capensis* Brurd.

Maxilliped, 2nd joint twice as long as broad, 4th and 5th broad, 6th and 7th much narrower than 5th, inner plate with two coupling-hooks, epipod reaching to end of 4th joint, narrow-lanceolate, outer margin angular.

Pereopod 1 stout, 2nd joint flask-shaped, 4th shorter than 3rd, 5th oval, enlarged, palm and hind margin subequal, defining angle obtuse and blunt, palm with 6 stout spines, 6th (finger) equal to palm, stout, inner margin straight, unarmed, 7th short, biunguiculate.

Pereopods 2-7 similar to one another, normal (as in *J. maculosa* Leech, but rather stouter than in Sars' figures in Crust. Norw. vol. 2, pl. 40), triunguiculate.

Pleopod 1, peduncle narrowing rapidly from base, thence divided into two divergent branches as long as basal portion, rounded and setose apically. There is no distinction between the basal and distal portions and no suture to indicate the limits of peduncle and ramus (if present).

Pleopod 2 ovate, apically subacute, ramus arising near apex, penial filament longer than peduncle.

Rami of the other pleopods narrow.

Uropod equal to the greatest width of the pleon, outer ramus shorter and narrower than inner, apically acute, inner ramus apically rounded.

*Length* : 3 mm. ; *breadth* : 5 mm.

*Colour* : White, eyes black.

*Locality:* Buffel's Bay (False Bay). 1/3/15. (K.H.B.) 1 ♂. Low-tide. (S.A.M. No. A3372.)

The chief peculiarities of this species are in the 1st pleopods and the 1st peraeopods, the latter bearing at first sight a strong likeness to the gnathopod of an Amphipod.

GEN. HAPLONISCUS Rich.

1908. *Haplomisus* Richardson, Proc. U.S. Nat. Mus. vol. 35 [1909], p. 75.

1914. .. Vanhöffen, Deutsch. Südpol. Exp. xv, 4, p. 557.

1916. .. Hansen, Dan Ingolf Exp. iii, 5, p. 28.

This genus was instituted to receive a species from the Arctic ocean described by Sars as *Nannomisus bicuspis* but which differed in several respects from the type-species, *N. oblongus*. At the same time Miss Richardson added two new species from deep water off the Atlantic coast of N. America.

There is one interesting feature in this genus which has not been commented upon by either Sars or Miss Richardson, namely, the structure of the telson. The lateral portions of the ventral surface have grown over and completely fused, if one may so express it, so as to form a chamber containing the 3rd-5th pleopods.

This chamber in the species described below is spacious owing to the high vaulting of the ventral surface; in the other species it is impossible to tell from the figures whether this surface is vaulted or not.

A somewhat similar chamber, containing the 2 pairs of maxillae and the mandibles, is formed by the sides of the head and closed in by the maxillipeds with their epipods, leaving a small aperture in front through which the food can enter.

The structure of the telson and probably also of the "buccal" chamber may be interpreted as an adaptation to habitat. All the species of the genus live at great depths, and although the nature of the bottom is not recorded in the case of the previously known species, it may be assumed to be a fine mud as in the case of the present species. Contrary to expectation there are no plumose straining setae round the edges of the operculum. There are a few widely spaced simple setae on the outer margin of pleopod 2 in ♂, and on the operculum in ♀. The anal opening is quite separate from the branchial chamber.

HAPLONISCUS DIMEROCERAS n. sp.

(Plate XVII. Figs. 4-7.)

Body nearly parallel-sided, whole of the dorsal and sternal surfaces minutely and closely pitted. Head about twice as broad as long,

anterior margin nearly straight, with a slight median point, side margins straight or very slightly emarginate in ♂, with the antero-lateral angles rounded but prominent, in ♀ gently convex without prominent antero-lateral angles.

Peraeon segments 1-4 short but gradually increasing in length, antero- and postero-lateral angles of the side plates rounded-quadrate; segment 5 equal to 4 in length, segments 6 and 7 decreasing in length, antero-lateral angles of side-plates on 5 rounded-quadrate, on 6 and 7 rounded, postero-lateral angles on all three segments acute.

Pleon a little narrower at base than peraeon segment 7, about as long as broad in ♂, a little shorter in ♀, narrowing very slightly posteriorly; side margins concave and sinuous in ♂, slightly convex in ♀, apex rounded, postero-lateral angles strongly acute and produced in ♂, nearly equal to  $\frac{1}{2}$  length of telson, in ♀ acutely produced but very little beyond the rounded apex. Upper surface in both sexes with 2 minute submedian tubercles in the middle.

The ventral surface of peraeon segments 1-4 in ♂ is moderately convex, of segments 5-7 and of the pleon strongly vaulted; in the ♀ the pleon is vaulted but all the peraeon segments are concave so as to accommodate the developing embryos.

Antenna 1. 1st joint stout, ovate, 2nd as long as 1st but very slender, more so in ♂ than ♀, 3rd  $\frac{1}{3}$  in ♂, in ♀  $\frac{1}{2}$  length of 2nd and equally slender, flagellum slender, nearly as long as peduncle, composed of 5 nearly equal joints in ♂, in ♀ of 1 stout and 2 long joints, the apical joint setose.

Antenna 2, peduncle stout, longer and stouter in ♂ than ♀, 3rd joint longer than 1st plus 2nd, with a stout spiniform upstanding dorsal projection at base, 4th short, 5th longer than 4th but shorter than 3rd, 6th equal to 3rd and ending in a narrow subacute point, the suture between 5th and 6th clear but the joints not freely moveable on one another, flagellum inserted before the apex of 6th, extremely slender, not quite as long as 5th plus 6th peduncular joints, composed of 8 setiferous joints.

Mouth-parts as figured by Sars for *H. bicuspis* (Norweg. N. Atlant. Exp. 14, p. 122, pl. 10, 1885), only the mandibular palp a little more slender.

Epistome prominent, triangular, the projecting anterior subacute apex visible from above.

Peraeopods as in *H. bicuspis*, similar to one another, but becoming longer and more slender posteriorly.

Three pairs of marsupial plates attached to segments 2-4, large, without marginal setae.

Pleopod 1 in ♂, the two peduncles closely united throughout their length but with a distinct suture, rami distinct, slightly diverging, apically rounded, a small tooth on outer margin.

Operculum in ♀ broader than long, evenly rounded, margin sparsely setose, surface scabrous.

Pleopod 2 in ♂, peduncle ovate, tapering to a subacute apex, inner margin nearly straight, minutely serrulate distally, inner ramus (stylet) geniculate, 1st joint short, 2nd reaching to apex of peduncle, swelling out in middle, apically blunt.

The other pleopods as figured for *H. bicuspis*.

Uropod uniaarticulate, setose.

Length: 2.5 mm.; breadth: 1 mm.

Colour: In spirit chalky white.

Locality: Cape Point, N. 89° E., distant 36 miles. 700 fathoms. Bottom green mud. Several ♂♂ and ovigerous ♀♀. s.s. "Pieter Faure." 20/8 03. (S.A.M. No. A4069.)

The specific name referring to the marked difference between the peduncle and flagellum of antenna 2, sharply distinguished from all the other species by antenna 2.

In this species the degree to which the postero-lateral angles of the pleon are produced differs in the two sexes, the ♀ resembling *H. bicuspis* (of which only the ♀ is known), the ♂ resembling *H. retrospinis*. Of the latter both sexes are known but there is no sexual difference.

## FAMILY MUNNIDAE.

1882. *Munnidae* Sars, Vidensk. Forh. Christ. No. 18, p. 17.  
 1897. .. G. O. Sars, Crust. Norw. vol. 2, p. 105.  
 1905. .. Richardson, Bull. U.S. Nat. Mus. No. 54, p. 479.

### GEN. PARAMUNNA Sars.

1866. *Paramunna* G. O. Sars, Beretn. Zool. Reise ved. Kyst. Christ. p. 31.  
 1897. .. id. l.c. vol. 2, p. 111.  
 1910. .. Stebbing, Gen. Cat. S.A. Crust. p. 435.

Stebbing in 1910 described *P. laevifrons* from South Africa, thereby reducing the character of the bilobed head, which Sars regarded as of generic value, to specific value. Tattersall had in 1905 (Fish. Irel. Sci. Inv. 1904, 2, p. 18) instituted the genus *Metamuana* to include a form also without frontal lobes, but which possessed certain features akin to *Pleurogonium* Sars. As he did not dissect out the mandibles

it is uncertain whether *Metomunna* should be regarded as closer to *Paramunna* or *Pleurogonium*. One cannot help feeling that *Metomunna* has a very short 3-jointed palp, and is not really distinct from *Paramunna*. The serrate pleon is very like that of *P. bilobata* Sars, whereas both *laecifrons* and the following species have an entire margined pleon.

PARAMUNNA CONCAVIFRONS n. sp.

(Plate XVII. Figs. 8, 9.)

Head broadly produced in front, anterior margin concave. Eyes situate on the pedunculate lateral portions, rather small. Peraeon oval, gradually decreasing in width posteriorly, the lateral portions of all the segments rounded. Pleon oval, lateral margins entire, apex shallowly bifid.

Antenna 1 6-jointed, the 3rd peduncular joint scarcely distinguishable from the flagellar joints.

Antenna 2, 3rd joint subequal to 5th, 4th small, 5th and 6th elongate, 6th a little longer than 5th, flagellum 10-jointed.

Upper lip rounded distally.

Mandibles, molar prominent, palp very small, 3-jointed.

Maxilla 1, inner plate with 2 setae.

Peraeopod 1 stout, inner apex of 5th joint blunt but prominent, setose, 6th ovate, finger not overlapping apex of 5th, with a prominent accessory unguis.

The other peraeopods fairly slender, 6th joint longest, finger biunguiculate.

Operculum of ♀ pear-shaped, apex truncate.

The pleopods and uropods were not satisfactorily dissected out.

Length: 1-1.5 mm.; breadth: ♂ .5 mm., ♀ .75 mm.

Colour: White with peraeon segments 1-4 greyish-brown, eyes black.

Locality: Mouille Point near Cape Town, November, 1913. 1 juv., and 26 2 14, 1 ♂, 1 ovigerous ♀, 1 juv. (K.H.B.); Durban. July, 1915, 1 nonovigerous ♀. (H. W. Bell-Marley.) (S.A.M. Nos. A3080, A3090 and A3838.)

GEN. KUPHOMUNNA Brnd.

1914. *Kuphomunna* Barnard, Ann. S. A. Mus. vol. 10, pt. 11, p. 438.

KUPHOMUNNA ROSTRATA Brnd.

1914. *Kuphomunna rostrata* Barnard, l.c. p. 438, pl. 38c (♂).

Since the first description of this species, based on a single ♂ much overgrown with extraneous matter, further specimens have come to light, including the ♀.

Male.—The front margin of the head is really more produced than in the original figure. The rostrate process appears to be the epistome.

Female.—Head of the same shape as in ♂. The epistome not nearly so produced as in ♂, but projecting slightly beyond the front margin of head, simply rounded.

Peraeon segment 1 not enlarged as in ♂, in fact, scarcely as long as segment 2.

Mouth-parts as in ♂. The absence of the mandibular palp was omitted in the diagnosis of the genus.

Peraeopod 1 less stout than in the ♂. 4th joint not apically produced, 5th not much broader than base of 6th, without spines.

Operculum longer than broad, somewhat pyriform, apex truncate.

The other peraeopods, the pleopods and uropods as in ♂.

Length: ♀ 1.75 mm.; breadth: 1 mm.

Colour: White, mottled dorsally with grey.

Locality: Buffel's Bay (False Bay). 28.9.13 and 1.3.15. (K.H.B.)  
1 ♂, 5 ovigerous ♀♀ and 1 juv. ♀. (S.A.M. Nos. A2543 and A3308.)

## FAMILY DESMOSOMIDAE.

1893. *Munnopsidae* (part) Stebbing, Hist. Crust. p. 383.

1897. *Desmosomidæ* Sars, Crust. Norw. vol. 2, p. 118.

1908. .. Richardson, Proc. U.S. Nat. Mus. vol. 35 [1909],  
p. 81.

1911. .. id. Bull. Mus. d'Hist. Nat. Paris, 1911, No. 7,  
p. 530.

### GEN. ? EUGERDA Mein.

1890. *Eugerda* Meinert, Crust. Malacostr. Cruise of the "Hauch,"  
p. 194.

1897. .. Sars, l.c. pp. 127, 252.

Two mutilated specimens are in the collection, but as they both lack the 1st peraeopods and the uropods it is impossible to ascertain with certainty whether they should be assigned to this genus or to *Desmosoma* Sars. From the character of the 1st peraeon segment

I have decided to place them in this genus but not to assign any specific name, merely giving the following brief description.

Head large, ovoid, not much produced in front. Peraeon segment 1 narrower than head and very short; segments 2 and 3 longer and about as wide as head; segment 4 a little narrower, posterior margin strongly convex, *i. e.* the postero-lateral angles are absent; segments 5 and 6 much narrower than 4, longer than broad, oblong; segment 7 apparently very short and appearing more like a short 1st pleon segment, but it is exactly in this region that the specimens are most mutilated. Side-plates on segments 1-4 acutely but shortly produced. Pleon ovate, apex broadly rounded. Antenna 1, 1st joint oblong, rest of antenna consisting of 4 slender joints, the proximal one inserted apically into 1st. Epipod of maxilliped narrow-lanceolate, apex acute, sides nearly straight. Pleopod 1 in ♂, peduncle not tapering, lateral margin slightly emarginate, apex subacute, ramus distinct, inserted obliquely, apex truncate and setulose. Operculum in ♀ oval, longer than broad. Pleopod 2 in ♂, peduncle nearly semicircular, apex acute, stylet reaching to apex, distal half very slender.

*Length*: 3.25 mm.; *breadth*: .75 mm.

*Colour*: In spirit whitish.

*Locality*: Cape Point N. 89° E., distant 36 miles. 700 fathoms. 1 ♂, 1 ♀. *s.s.* "Pieter Faure." 20 8.03. (S.A.M. No. A4067.)

#### GEN. MACROSTYLIS Sars.

1864. *Macrostylis* G. O. Sars. Vidensk. Selsk. Forh. Christ. 1863.

1886.     ,,     Beddard. *Challeng. Rep.* vol. 17, p. 173.

1890. *Vana* Meinert. *Crust. Malacostr. Cruise of the "Hauch,"* vol. 3, p. 195.

1897. *Macrostylis* Sars, *Crust. Norw.* vol. 2, pp. 120, 250.

1916.     ,,     Hansen, *Dan. Ingolf Exp.* iii, 5, p. 75.

#### MACROSTYLIS SPINICEPS, n. sp.

(Plate XVII. Figs. 10-12.)

Male.—Body smooth, glabrous. Head broader than long, anterior margin not greatly produced, straight, postero-lateral angles acutely produced. Peraeon segments 1 and 2 subequal, postero-lateral angles of 1 acute, of 2 subacute; segment 3 longer, especially at the sides, postero-lateral angles acutely produced; segments 4-7 sharply marked off from the anterior segments, gradually decreasing in width, 4 shortest, 5 and 6 subequal, postero-lateral angles of each produced into acute



spiniform processes. All the segments with a medio-ventral, straight, spiniform process.

Pleon a little longer than broad, lateral margins convex proximally, concave distally, with a few minute setules, postero-lateral angles quadrate, distal margin very slightly produced.

Antenna 1 rather more developed than usual in the genus, stout, the 3 peduncular joints not differing greatly in size, flagellum 2-jointed, 1st shorter, 2nd longer than any of the peduncular joints, both joints with apical tufts of long filamentous sensory setae.

Antenna 2, first 3 joints short, 4th long and slender, 5th a little shorter than 4th, flagellum very slender, a little longer than 4th joint, ca. 10-jointed.

Mouth-parts normal, as figured by Sars for *M. spinifera*. (Crust. Norw. vol. 2, pl. 51.)

Pereopod 1 as in *spinifera*, but 5th joint subequal to 3rd and 7th only half length of 6th.

Pereopod 2 as in *spinifera*, but 3rd and 4th joints with setae on lower apices, 5th slender and equal to 3rd.

Pereopod 3 similar to that of *M. longiremis* (Mein.) (Sars, l.c. Suppl. pl. 2), but 5th joint narrower in proportion to width of 4th, the armature of the joints the same.

Pereopod 4 as in *longiremis* but 5th joint relatively narrower.

Pereopods 5 and 6 as in *spinifera*.

Pereopod 7 as in *spinifera* but 5th joint  $\frac{1}{2}$  as long again as 2nd, 6th  $\frac{1}{4}$  as long again as 2nd, 7th plus unguis  $\frac{1}{2}$  length of 6th.

Pleopod 1 in ♂, peduncles indurated, narrow, tapering slightly to subacute apices, rami narrow, projecting beyond apices of peduncles, slightly expanding, apices rounded and setulose.

Pleopod 2 in ♂, peduncle indurated, narrow, slightly curved, the inner margin being concave, outer margin distally serrulate, with a plumose seta arising from each notch, stylet reaching to, but not beyond, apex of peduncle, basal joint stout, 2nd joint proximally stout then narrowing rapidly to a fine point, outer ramus apparently absent.

Uropods lost.

Length: 3 mm.; breadth: 75 mm.

Colour: In spirit chalky white.

Locality: Cape Point N. 89° E., distant 36 miles. 700 fathoms. 1 ♂. s.s. "Pieter Faure." 20 8.03. (S.A.M. No. A4132.)

This species is easily distinguished from the other three species of the genus by the spiniform processes of the head and the greater development of the 1st antennae.

GEN. RHABDOMESUS Rich.

1886. *Ischaosoma* (part) Beddard, Challeng. Rep. vol. 17, p. 39.  
1908. *Rhabdomesus* Richardson, Proc. U.S. Nat. Mus. vol. 35 [1909],  
p. 81.  
1914. .. Vanhöffen, Deutsche Südpol. Exp. vol. 15, pt. 4,  
p. 560.

The "Challenger" obtained two species of this interesting genus in the Southern oceans: *R. bacillus* (Bedd.) from 1800 fathoms off Melbourne and *R. bacilloides* (Bedd.) from 1450 fathoms off Valparaiso. There was only one specimen of each species and both were fragmentary. Great interest therefore attaches to the two specimens in the "Pieter Faure" Collection, not only because they are from a new locality but mainly because they are complete except for the long and extremely slender pereopods and 2nd antennae. A description of the mouth-parts can therefore be given and Beddard's description of the pleopods confirmed.

The only example since obtained is *R. inermis*, taken by the "Gauss" in the Antarctic Ocean.

RHABDOMESUS BACILLOPSIS n. sp.

(Plate XVII. Fig. 13.)

Male.—Body very elongate, glabrous. Head broader than long, somewhat immersed in the 1st pereaeon segment, anterior margin slightly convex. Pereaeon segment 1 shorter than 2, its lateral parts directed forwards and embracing the base of the head. Segments 2 and 3 subequal, the lateral portions prominent and rounded. Segment 4 anteriorly similar to 3, the posterior portion much narrowed, elongate, cylindrical, the whole segment a little longer than segments 1-3 together. Segment 5 longer than 4, anteriorly narrow and cylindrical, posteriorly widening, the lateral portions directed backwards. Segments 6 and 7 subequal, a little shorter than 2 or 3. All the segments, including 7, bear on the lateral portion a strong spiniform projection which is curved forwards on the anterior 4 segments, backwards on the 3 posterior ones.

Pleon segment 1 very short and narrower than segment 2, which is shield-like, ovate, apically rounded.

Antenna 1 reaching back to 3rd pereaeon segment, basal joint somewhat triangular, followed by one very slender, elongate and strongly indurated joint, flagellum still more slender, shorter than the preceding long joint, 4-jointed, ending in 2 long unequal setae.

Antenna 2 broken off at the 3rd joint in both specimens.

Mandible, cutting-edge 4-dentate, secondary cutting-edge bidentate, spine-row with 6 spines, molar prominent, palp absent.

Lower lip with the lobes ovate, somewhat incurved, apices rounded, with a tuft of setae.

Maxillae 1 and 2 normal.

Maxilliped, 2nd joint longest, 3rd rather narrow, 4th and 5th broader than 3rd, 6th much narrower than 5th, not strongly lobed internally, 7th narrower than 6th, inner plate with 2 coupling-hooks; epipod reaching to base of 5th, ovate, apex subacute, outer margin straight, angular near the base.

Peraeopods all broken off at the 2nd joint in both specimens; the 2nd joint of all the peraeopods is elongate and very slender.

Pleopod 1 in ♂ strongly indurated, very similar to Beddard's figure of that of *bacilloides*, but apices of peduncles and rami not prominent.

Pleopod 2 in ♂ as in Beddard's figure of that of *bacilloides*, but the stylet apically not tapering so gradually, more abruptly acute.

Uropod 2-jointed. 1st joint short, 2nd a little more than twice length of 1st, tipped with 2 setae.

*Length*: 7 mm.; *breadth* across broadest part: 75 mm.; across narrow part: 25 mm.

*Colour*: In spirit porcelain white.

*Locality*: Cape Point N. 89° E., distant 36 miles. 700 fathoms. Bottom green mud. 2 ♂♂. s.s. "Pieter Faure." 20/8/03. (S.A.M. No. A4066.)

#### ILYCHTHONOS n. g.

Body moderately elongate. Head nearly globular, not excavate for the insertion of the antennae. Peraeon segment 1 not very short, not embracing the head; segments 4 and 5 not elongate, not much narrower than 3. Pleon consisting of one segment only. Antenna 1 short. Only the basal joints of antenna 2 known. Mouth-parts normal: mandibular palp reduced and feeble, 3rd joint minute, unarmed, molar well developed; 6th joint of maxilliped not lobed internally. Peraeopods 1-4 slender, increasing length, 5th joint in peraeopods 3 and 4 elongate; peraeopods 5-7 a little stouter, moderately spinose. First pleopods in ♂ with peduncles fused basally, rami indistinct. Operculum in ♀ ovate, keeled, apically cleft. Pleopod 2 in ♂ with stylet rather stout, reaching a little beyond apex of peduncle. Uropod uniramous.

This genus is near to the typical genus *Desmosoma*, but differs in having a well-developed molar but a reduced palp on the mandible.

The apically-cleft operculum in the ♀ is unique, also the fused basal portions of the 1st pleopods in ♂.

Perhaps congeneric with *Syneurycope* Hansen, 1916.

ILYCHTHONOS CAPENSIS n. sp.

(Plate XVII. Figs. 14-16.)

Body smooth, glabrous. Head strongly convex in profile, in dorsal view nearly circular, a little broader than long, lateral portions not developed, frontal margin not produced but declivous between the bases of 1st antennae. Peraeon segment 1 a little broader than head, a little more than twice as broad as long, not embracing head; segment 2 a little longer and wider, not twice as broad as long; segments 3 and 4 subequal, posterior margins shorter than anterior margins; antero-lateral angles of all 4 anterior segments rounded; segments 5-7 together not nearly as long as the 4 anterior ones together, segment 5 longer at the sides than dorsally, 6 of equal length throughout, 7 longer dorsally than at the sides, its posterior margin straight. Side-plates on segments 1-4 not very distinct.

Pleon of a single segment, at least without visible suture between the short basal and the longer distal portions, the latter broad proximally, contracting suddenly to a much narrower distal part which is apically subacute.

Antenna 1, 1st joint moderately stout, conical, 2nd inserted apically, a little longer than 1st, 3rd a little longer than 2nd, flagellum equal to 2nd plus 3rd, with ca. 12 indistinctly separated joints.

Only the basal joints of antenna 2 remaining, 1st joint with a spine on lower outer apex.

Upper lip rounded, minutely setulose.

Lower lip, inner apices of lobes quadrate, with a rather strong tuft of setules.

Mandible, cutting-edge 4-5 dentate, secondary cutting-edge bifid, spine-row with 3 fimbriate spines, molar well developed, palp small, unarmed, 1st joint shorter than 2nd, 3rd minute, indistinctly separated from 2nd, tipped with 1 setule.

Maxillae 1 and 2 normal.

Maxilliped, 2nd joint longest, 4th and 5th broad, inner distal margin of 5th with 3 denticles, 6th and 7th small but well developed, 6th not lobed internally, epipod very large, reaching to 5th joint, nearly twice width of maxilliped, ovate, apex narrowly rounded, outer margin angular.

Peraeopods 1-4 slender, increasing in length posteriorly, very feebly

armed, especially peracopods 3 and 4, in these latter 5th joint very elongate and slender.

Peraeopods 5-7 a little stouter than the anterior ones, slightly decreasing in length posteriorly, 5th and 6th joints with moderately numerous outstanding spines, inner apex of 6th joint in peracopod 7 with 1 spine almost as long as the 7th joint plus unguis.

First pleopods in ♂, peduncles narrow, apparently set on a completely fused basal portion, apices truncate, rami not distinct.

Operculum in ♀ ovate, apex cleft for  $\frac{1}{4}$  its length, keel moderately strong and extending as far as the cleft, outer distal margins with plumose setae.

Pleopod 2 in ♂, peduncle narrow-ovate, apex subacute, outer distal margin with plumose setae, stylet rather stout, straight, reaching a little beyond apex of peduncle, outer ramus small.

Uropod uniramous, 2-jointed, the joints subequal, both tipped with setae.

*Length*: 5 mm.; *breadth*: 1 mm.

*Colour*: In spirit chalky white.

*Locality*: Cape Point N. 89° E., distant 36 miles. 700 fathoms. 2 ♂♂, 4 nonovigerous ♀♀. s.s. "Pieter Faure." 20/8/03. (S.A.M. No. A4030.)

## FAMILY MUNNOPSISIDAE.

For references see Barnard, Ann. S.A. Mus. vol. 10, pt. 7, p. 225, and add:

1914. Vanhöffen, Deutsche Südpol. Exp. vol. 15, pt. 4, p. 582.

### GEN. PSEUDOMUNNOPSIS Hansen.

1916. *Pseudomunnopsis* Hansen, Dan. Ingolf Exp. iii, 5, p. 160.

#### PSEUDOMUNNOPSIS BEDDARDI (Tatt.).

(Plate XVII. Figs. 17, 18.)

1905. *Munnopsoides beddardi* Tattersall, Fish. Irel. Sci. Invest. 1904, ii, p. 26, pl. 6, figs. 1-8.

1916. *Pseudomunnopsis* ,, Hansen l.c. pp. 10, 160, pl. 14, figs. 3a-m.

Body glabrous. Head about as broad as long, strongly convex in profile, anterior margin slightly convex. Peraeon segment 1 curving forwards laterally, embracing the basal part of the head, shorter and narrower than segment 2, segments 2-4 subequal in length, 4 a little narrower than 3, all 4 segments with a transverse ridge both on the

posterior and on the anterior margin, the anterior one more prominent than the posterior, especially medianly, and in one ♀ specimen produced into an acute median tooth on segments 1-3; the presence of these teeth is evidently a variable feature but cannot be called discontinuous, as the greater prominence of the ridge in the medio-dorsal line shows clearly how such teeth can be developed. Peraeon segment 5 nearly equal to segments 1-4 together, 6 and 7 very short. Side-plates on segments 1-4 only.

Pleon a little longer than peraeon segment 5, narrow-ovate, widest in the middle, apex bluntly rounded.

Antenna 1 reaching in ♂ to end of 4th, in ♀ to beginning of 3rd peraeon segment, 1st joint stout, conical, apex blunt, 2nd inserted before apex of 1st, only  $\frac{1}{2}$  width of 1st at the place where 2nd is inserted, 3rd  $\frac{1}{2}$  width and  $\frac{1}{2}$  length of second, flagellum longer than peduncle, 9-jointed in ♀, 1st joint very short, 2nd twice as long as any of the following, in ♂ with a short 1st joint and a long 2nd joint, composed of a large number of partly fused joints.

Only the basal joints of antenna 2 remaining.

Mandible conical, tapering to a subacute, feebly bifid apex, molar, spine-row and palp entirely absent.

Maxillae 1 and 2 as figured for *beddardi* Tattersall (l.c. p. 26, pl. 6).

Maxilliped, 2nd joint longest, 3rd very short, 4th broad, inner margin concave, inner apex acute, slightly produced, 5th as broad as but scarcely  $\frac{1}{2}$  as long as 4th, inner margin sinuous, inner apex acute, slightly produced, 6th and 7th very slender, 7th a little longer than 6th, epipod reaching to apex of 4th joint, ovate-lanceolate, inner plate with 2 coupling-hooks (termed "sensory processes" in the description of *beddardi*).

Peraeopod 1 short, 2nd joint longest, nearly equal to 3rd-5th together, 4th shortest, broader than long, 5th equal to 3rd, somewhat ovate, inner margin convex, with 3 spine-setae distally, 6th as long as but only  $\frac{1}{2}$  width of 5th, 7th scarcely  $\frac{1}{2}$  length of 6th.

Peraeopods 2-4 except the 2nd joints, lost in all the specimens.

Peraeopods 5-7 very slender, 2nd and 3rd joints subequal, 4th very short, 5th a little longer than 3rd, apparently without any setae, 6th subequal to 3rd, narrow-ovate, widened slightly distally, setae on one margin only, 7th absent.

Pleopod 1 in ♂ reaching to apex of pleon, peduncles contiguous throughout their entire length, fused but with distinct suture, very narrow, widening slightly before the blunt apex, ramus very small, inserted obliquely on inner apex.

Operculum in ♀ reaching to apex of pleon, nearly circular when flattened out, but in the natural position folded longitudinally, roof-like.

Pleopod 2 in ♂ reaching to apex of pleon, peduncles large, semi-circular, fused along the straight inner margins but with distinct suture, in natural position folded longitudinally, roof-like, slightly diverging distally where the short, geniculate, apically subacute inner rami (stylets) are inserted, the rami not projecting beyond the apices of the peduncles.

Uropod slender, uniramous, 2nd joint a little longer than 1st.

*Length*: ♂ 3.5 mm., ♀ 4 mm.; *breadth*: across anterior part of body ♂ 1 mm., ♀ 1.25 mm. Another ♀ measures 5.5 × 1.5 mm. and the anterior half of another (ovigerous) ♀ measures 2 × 2 mm.

*Colour*: In spirit pinkish-white.

*Locality*: Cape Point N. 89° E., distant 36 miles. 700 fathoms. Bottom green mud. 2 ♂♂, 3 ♀♀, 2 fragments. s.s. "Pieter Faure." 20/8/03. (S.A.M. No. A4068.)

*Geogr. Distribution*: W. coast of Ireland, 199–382 fathoms (Tattersall); Davis Strait, 1435 fathoms and Faroe Is., 463–515 fathoms (Hansen).

#### GEN. ILYARACHNA Sars.

1863. *Mesostenus* G. O. Sars, Chr. Vid. Selsk. Forh. 1863, p. 211  
(nom. preocc.).
1870. *Ilyarachna* id. Christ. Fjord. Dybvands Fauna, 1869, p. 44.
1886. .. Beddard, *Challeng. Rep.* vol. 17, p. 76.
1896. .. Bonnier, *Ann. Univ. Lyons*, vol. 26, p. 608.
- 1897–8 .. Sars, *Crust. Norw.* vol. 2, p. 134.
1901. .. Ohlin, *Bih. Sv. Vet. Akad.* vol. 26, pt. 4, No. 12,  
p. 37.
1905. .. Tattersall, *Fish. Irel. Sci. Inv.* 1904, ii, p. 28.
1911. .. Richardson, *Bull. Mus. d'Hist. Nat. Paris*, 1911,  
No. 7, p. 533.
- 1914 .. Vanhöffen, *Deutsche Südpol. Exp.* vol. 15, pt. 4,  
p. 591.

#### ILYARACHNA AFFINIS n. sp.

Body smooth, glabrous. Head broader than long, with a transverse ridge on both anterior and posterior margin. Peraeon segments 1–3 subequal, 4 longer distally, its anterior margin curved forwards, antero-lateral angles, especially those of segment 2, acute, segments

5-7 narrower than 4, gradually decreasing in width, 5 shortest dorsally, 6 shortest laterally, 7 of equal width throughout, all the segments with transverse ridges marking the anterior and posterior margins, the anterior ones on segments 1-3 very faintly denticulate in two of the specimens; side-plates distinct on first 4 segments.

Pleon a little longer than 6th and 7th pereaeon segments together, only a little narrower at base than 7th segment, basal margin straight with a transverse ridge, narrowing to a subacute apex, lateral margins straight except for a slight convexity above the insertion of the uropods.

Antenna 1, 1st joint subtriangular, outer apex subacutely produced, with 2 spines, outer margin with 2 spines near base and 1 in middle, inner margin with 3 spines just before insertion of 2nd joint, 3rd more slender than 2nd and a little longer, flagellum about equal to 2nd plus 3rd joints, 6-jointed, 1st joint shortest.

Only the basal joints of antenna 2 remaining.

Mouth-parts as figured by Sars for *I. longicornis* (1897, l.c. pl. 59).

Pereaeopod 1 also as in *longicornis*. All the other pereaeopods lost.

Operculum in ♀ ovate-lanceolate, with a strong and sharp median longitudinal keel reaching almost to the subacute apex.

Uropods lost.

*Length*: 5 mm.; *breadth*: 1.75 mm.

*Colour*: In spirit pinkish-white.

*Locality*: Cape Point N. 89° E., distant 36 miles. 700 fathoms. 4 nonovigerous ♀♀. s.s. "Pieter Faure." 20 8'03. (S.A.M. No. A4065.)

Very close to *longicornis* from the N. Atlantic, but distinguished by having the *outer* angle of the 1st joint of 1st antenna produced instead of the *inner*, and by the 5th pereaeon segment being very distinctly narrower than 4th (thereby distinguished also from *plunketti* Tattersall, l.c. p. 28, pl. 7\*), with straight or very slightly emarginate, instead of convex, sides. The denticulation on the anterior margins of the first 3 segments is a variable feature (cf. Ohlin's remarks on *hirticeps* and *denticulata* in l.c. supra, p. 36).

#### ILYARACHNA CRASSICEPS n. sp.

Body smooth, glabrous. Head broader than long, the lateral portions not very pendulous, no transverse ridges on anterior or posterior margins. Pereaeon segment 1 narrower than head, very short; segment 2 longer and wider, both 1 and 2 laterally obtuse; segment 3 with acute antero-lateral angles; segment 4 longer than 3.

\* But see Hansen, l.c. 1916, p. 122.



lateral angles rounded-quadrate; segment 5 at base distinctly narrower than 4, widening distally, postero-lateral angles rounded, posterior margin concave: segment 6 of the same length laterally as dorsally, the posterior margin therefore concave, slightly narrower than 5; segment 7 slightly narrower than 6, posterior margin straight or very slightly trilobed, segment therefore longer dorsally than laterally. No transverse ridges on any of the segments. Side-plates on anterior segments not very distinct.

Pleon as broad basally as 7th pereaeon segment, about as broad as long, lateral margins straight, apex obtuse.

Antenna 1, 1st joint stout, neither outer nor inner apex produced, the other joints lost.

Only the 3 basal joints of antenna 2 remaining.

All the pereopods, except the 2nd joints, lost.

Pleopod 1 in ♂ narrow, apex of peduncle acute, ramus distinct, very narrow, projecting slightly beyond apex of peduncle, tipped with setules.

Operculum in ♀ with a sharp keel extending nearly to apex, denticulate in profile and setose like the rest of the surface.

Pleopod 2 in ♂, peduncle ovate, inner margin straight, apex acute, stylet reaching to apex of peduncle, the distal quarter of its length very fine.

*Length*: 2.75 mm.; *breadth*: 1.25 mm.

*Colour*: In spirit pinkish-white.

*Locality*: Cape Point N. 89° E., distant 36 miles. 700 fathoms. 1 ♂, 1 nonovigerous ♀. s.s. "Pieter Faure." 20 8/03. (S.A.M. No. A4133.)

#### GEN. EURYCOPE Sars.

1864. *Eurycope* G. O. Sars, Chr. Vid. Selsk. Forh. 1863, p. 208.  
 1886.     "     Beddard, Challeng. Rep. vol. 17, p. 58.  
 1896.     "     Bonnier, Ann. Univ. Lyons, vol. 26, p. 596.  
 1897.     "     Hansen, Bull. Mus. Comp. Zool. Harv. vol. 31, no. 5,  
           p. 96.  
 1897-8.   "     Sars, Crust. Norw. vol. 2, p. 144.  
 1901.     "     Ohlin, Bih. Sv. Vet. Akad. vol. 26, pt. 4, no. 12,  
           p. 34.  
 1905.     "     Tattersall, Fish. Irel. Sci. Inv. 1904, II, p. 30.  
 1905.     "     Richardson, Bull. U.S. Nat. Mus. no. 54, p. 490.  
 1908.     "     id. Proc. U.S. Nat. Mus. vol. 34, p. 67.  
 1908.     "     id. ibid. vol. 35 [1909], p. 84.  
 1910.     "     id. ibid. vol. 37, p. 120.

1911. *Eurycope* Richardson, Bull. Mus. d'Hist. Nat. Paris, 1911,  
no. 7, p. 532.  
1914. „ Vanhöffen, Deutsche Südpol. Exp. vol. 15, pt. 4,  
p. 586.  
1916. „ Hansen, Dan. Ingolf Exp. iii, 5, p. 137.

*EURYCOPE SULCIFRONS* n. sp.

(Plate XVII. Figs. 22, 23.)

Body smooth, glabrous. Head short laterally but strongly produced forwards in a moderately broad process, which is apically rounded and dorsally shallowly grooved, a low rounded tubercle in the middle of the head. Peraeon segments 1-4 increasing gradually in width and length, laterally rounded, with rounded side-plates; segments 5-7 decreasing in width posteriorly, 5 longest at the sides, 6 longest dorsally, the anterior margin rather strongly convex, 7 of equal width throughout and about equal to the greatest length of 5, antero- and postero-lateral angles rounded. Pleon as broad as long, antero-lateral angles quadrate, apex rounded.

Antenna 1, 1st joint apically rounded, scarcely produced, 3rd nearly equal to 2nd, flagellum incomplete but at least 14-jointed.

Only the basal joints of antenna 2 remaining.

Maxilliped, 4th joint broader than long, outer apex shortly and acutely produced, 5th broader than long, greatest length on inner margin, which is distally cut into small shallow notches each with a setule, outer margin very short, outer apex acute, 6th strongly lobed internally, epipod reaching to middle of 5th joint, lanceolate, a little more than twice as long as broad, apex acute, outer margin scarcely angular, concentric sculpturing faint.

Peraeopods 1-4 lost. Peraeopods 5-7, 5th joint very strongly expanded, 6th also broadly ovate, not twice as long as broad, 7th  $\frac{1}{2}$  width of 6th, straight, narrow-ovate.

Pleopod I in ♂, peduncle widest basally, tapering with slightly sinuous margins lateral to a blunt apex bearing a few setules, rami not distinct. Operculum in ♀ nearly circular.

Pleopod 2 in ♂, peduncle semicircular, inner margin slightly concave, stylet inserted about the middle, basal part of 2nd joint rather stout, distal part abruptly narrower, outer ramus between stylet and apex of peduncle.

Uropods lost.

*Length*: 4 mm.; *breadth*: 1.5 mm.

*Colour*: In spirit dirty pinkish.

*Locality:* Cape Point N. 89° E., distant 36 miles. 700 fathoms. Bottom green mud. 1 ♂, 9 ♀ ♀, some ovigerous. s.s. "Pieter Faure." 20/8/03. (S.A.M. No. A4063.)

In the shape of the head and the body this species is close to *E. parva* Bonnier (i.e. p. 600, pl. 33, fig. 4). The 5th and 6th peraeon segments, however, are not fused dorsally, segments 1-4 are not produced anteriorly and the 1st and 2nd pleopods differ in shape.

EURYCOPE QUADRATA n. sp.

(Plate XVII. Figs. 20, 21.)

Body smooth, glabrous. Head moderately long, shortly produced in front in a quadrangular process broader than long. Peraeon segments 1-4 subequal, increasing in width, side-plates directed forwards, acute; segments 5-7 decreasing in width, 5 and 6 subequal in length and of equal length throughout, 7 nearly as long as 5 and 6 together, antero-lateral angles of all three acutely, but shortly, produced forwards, postero-lateral angles rounded. Pleon as broad as long, antero-lateral angles acute, apex rounded.

Antenna 1, 1st joint apically rounded, not produced, the other joints lost.

Antenna 2, all except the basal joints lost.

Maxilliped, 4th and following joints in all the specimens broken off, epipod similar to that of *E. cornuta* (figured by Sars, i.e. pl. 64), apically acute, outer margin strongly produced in a blunt process, with the margin on either side concave, concentric sculpturing on epipod and 2nd joint strongly marked.

Peraeopods 1-7 all lost.

Pleopod 1 in ♂, peduncles of nearly the same width throughout, lateral margins sinuous, apices narrow acute, rami distinct, apically subacute with a few setules.

Pleopod 2 in ♂, peduncle subtriangular, inner margins straight, outer strongly angular near base, apex truncate, stylet inserted about middle of inner margin, tapering gradually, outer ramus broad, inserted on the truncate apex of peduncle.

Uropods lost.

*Length:* 4 mm.; *breadth:* 1.75 mm.

*Colour:* In spirit dirty pinkish.

*Locality:* Cape Point N. 89° E., distant 36 miles. 700 fathoms. Bottom green mud. 9 specimens, some mutilated. s.s. "Pieter Faure." 20/8/03. (S.A.M. No. A4062.)

This species is close to *E. complanata* Bonnier (1896, i.e. p. 601,

pl. 34, fig. 1), but has a more elongate pleon and a less produced and blunter median process on the head. The epipod of the maxilliped and the 2nd pleopod are very much alike in the two species.

*EURYCOPE FUSIFORMIS* n. sp.

(Plate XVII. Fig. 19.)

Female.—Body widest in the middle, tapering towards both ends, smooth, glabrous. Head strongly emarginate in front, lateral portions not developed. Peraeon segment I wider than head, segments 1–4 increasing gradually in width, antero-lateral angles of 1 and 2 quadrate, of 3 and 4 shortly acute; segment 5 widest of all, longer laterally than dorsally, antero-lateral angles rounded-quadrate, posterior margin concave; segment 6 of same length laterally as dorsally, posterior margin concave; segment 7 longer dorsally than laterally, posterior margin straight; segments 5–7 closely united, with nearly straight and even lateral margins, narrowing gradually posteriorly. Transverse ridges not developed. Side-plates distinct only on segments 3 and 4. Pleon at base as broad as peraeon segment 7, almost an equilateral triangle in shape, lateral margins slightly convex, apex subacute.

Antenna 1, 1st joint stout, 2nd short and much narrower, 3rd very slender, flagellum at least 5-jointed, 1st very short.

Antenna 2, except the basal joints, lost.

Mandibular palp with 3rd joint falciform.

Epipod of maxilliped broad, the inner margin and the proximal portion of outer margin subparallel, the distal portion of outer margin bevelled off straight or very slightly concave to the subacute apex.

All the peraeopods lost.

Operculum with a broad strong keel extending to apex.

*Length*: 3.5 mm.; *breadth*: 1.5 mm.

*Colour*: In spirit pinkish-white.

*Locality*: Cape Point N. 89° E., distant 36 miles, 700 fathoms. 3 nonovigerous ♀ ♀. s.s. "Pieter Faure." 20 8/03. (S.A.M. No. A4134.)

This species is in general appearance like *Ilyarachna plunketti* Tattersall (l.c. p. 28, pl. 7), but differs in having the anterior margin of 7th peraeon segment strongly convex and the pleon shorter relatively to its length—two features which bring it very close to *I. abyssorum* Rich. (Bull. Mus. d'Hist. Nat. Paris, 1911, no. 7, p. 533). Both species are without lateral developments of the head, but the latter species has no palp to the mandible and a distinctly biramous uropod.

The only features by which the generic position of the present specimens can be determined are the mandibular palp and the epipod of the maxilliped. Both of these are of the type found in *Eurycope*.

## EPICARIDEA.

This tribe has hitherto been poorly represented in the fauna list of South African Crustacea. Stebbing in the General Catalogue, 1910, records only two species. In 1914 were added:

*Liriopsis* sp., from Durban, by Brady (Ann. Durban Mus. vol. 1, pt. 1, p. 7, pl. 3, figs. 9-15).

*Hemiarthrus nematocarciini* by Stebbing (Ann. S.A. Mus. vol. 15, pt. 1, p. 47, fig.).

*Zomophryxus quinquedens* by Barnard (ibid. vol. 10, pt. 7, p. 228, pl. 22).

Together with the species recorded below the number of the South African *Epicaridea* now totals 11.

With regard to the explanation of Brady's figures of *Liriopsis*, it may be remarked that, presumably by misprint, fig. 12 is labelled "first foot," whereas its structure shows it to be either the 6th or 7th; fig. 14 labelled as "second foot?" may be either the 1st or 2nd.

## FAMILY BOPYRIDAE.

1905. *Bopyridae* Richardson, Bull. U.S. Nat. Mus. no. 54, p. 498.

1908. .. Stebbing, S.A. Crust. pt. 4, p. 56.

1910. .. id. Tr. Linn. Soc. Lond. Zool. vol. 14, pt. 1, p. 111.

The separation of the two genera *Pseudione* and *Palaegyge* according to the presence or absence of warts on the pleopods of the female proposed by Giard and Bonnier and accepted by Stebbing (Hist. Crust. 1893, p. 410), is not recognised by Sars (Crust. Norw. vol. 2, p. 202). It would seem, however, to be a useful division though somewhat arbitrary, and moreover it can be correlated with the habitat: the species of *Palaegyge* occur on the *Caridea*, the species of *Pseudione* on the *Anomala* and *Thalassinida*.

### GEN. PALAEGYGE Giard & Bonn.

1888. *Palaegyge* Giard & Bonnier, Bull. Sci. Fr. Belg. vol. 19, p. 68  
(sep. copy, pp. 3, 7, 11).

1890. .. id. ibid. vol. 22, p. 384.

1892. .. Weber, Zool. Ergebn. vol. 2, p. 557.

1893. *Palaegyge*, Stebbing, Hist. Crust. p. 410.  
1900.     ..     Bonnier, Trav. Stat. Zool. Wimereux, vol. 8, p. 332.  
1910.     ..     Horst, Notes from Leyden Mus. vol. 32, No. 1, p. 67.  
1912.     ..     Richardson, Proc. U.S. Nat. Mus. vol. 42, p. 521.

*PALÆGYGE PLESIONIKÆ* n. sp.

(Plate XVII. Figs. 24, 25.)

Female.—Head a little wider than long, anterior margin straight or slightly concave, “limbe posterior” entire, each of its exterior angles produced into a rather stout, curved process. Ovarian bosses on first 4 peraeon segments: epimera not conspicuous, not developed as lamellae on the last 3 segments. Pleon of 6 distinct segments, the last entire; pleurae entire, not greatly developed, not concealing the outer rami of pleopods.

Antenna 1 3-jointed, basal joint stout, completely separated from its fellow by the triangular frontal plate, with apical tuft of setae.

Antenna 2 7-jointed, basal joint stout, distal 2 joints minute, with apical tuft of setae.

Maxilliped divided into two portions by an oblique suture, anterior portion quadrangular, postero-exterior angle produced backwards into a long curved process, palp rather large, strongly setose, posterior portion subtriangular, antero-interior angle produced.

The five pairs of marsupial plates overlap in the centre. First pair with the distal lobe produced backwards in a blunt process. The margin of the overlapping ridge has three small indentations. The hind margins of all the pairs, except the first, fringed with setae, those on the 5th being strong and conspicuous.

Pleopods increasing successively in length and diminishing in thickness posteriorly, the outer rami larger than the inner, both smooth.

Uropods slightly curved, tapering, with blunt apices.

Male.—Lanceolate in outline, head broader than long, anterior margin evenly rounded, eyes small but distinct. Peraeon segments all distinct, laterally rounded. Pleon segments also distinct, the lateral portions directed backwards, the 6th segment triangular, with a few short spines on postero-external angles.

Antenna 1 3-jointed, basal joint large, not contiguous with its fellow, with apical tuft of setae.

Antenna 2 7-jointed, basal joint not very enlarged, 6th and 7th minute, with apical tuft of setae.

Pleopods rudimentary, lobe-like projections on 1st-5th pleon segments.

*Length*: ♀ 15 mm., ♂ 4 mm.; *breadth*: ♀ 9 mm.: ♂ 1.5 mm.

*Colour*: In spirit pale yellowish.

*Locality*: Table Mountain N. 79° E., distant 40 miles. 250 fathoms. 3 ♀♀, 1 ♂; Cape Point NE.  $\frac{3}{4}$  E., distant 29 miles. 470 fathoms. 1 ♀, 1 ♂. s.s. "Pieter Faure." 18/4/00 and 11/6/03. (S.A.M. Nos. A2274 and A2275.)

*Host*: *Plesionika martia* (M. Edw.). In the branchial cavities, both right and left, chiefly the former, the males are attached sometimes to the pleopods of the female, head hindermost, sometimes transversely across the middle of the brood-pouch.

In this species the uropods in the ♀ are more developed than appears usual in this genus according to definition. Moreover, the species hitherto described have all been taken from members of the family *Palaemonidae*, whereas the host of the present species belongs to the *Pandalidae*.

#### GEN. PSEUDIONE KOSM.

1881. *Pseudione* Kossmann, Zeitsch. Wiss. Zool. vol. 35, p. 663.  
 1890. .. Giard and Bonnier, l.c. p. 377.  
 1893. .. Stebbing, l.c. pp. 410, 411.  
 1897. .. Hansen, Bull. Mus. Comp. Zool. Harv. vol. 31, No. 5,  
     p. 118.  
 1898. .. Sars, Crust. Norw. vol. 2, p. 200.  
 1898. .. Calman, Ann. N.Y. Ac. Sci. vol. 11, No. 13, p. 274.  
 1900. .. Bonnier, l.c. p. 292.  
 1904. .. Richardson, Proc. U.S. Nat. Mus. vol. 27, pp. 78, 83.  
 1905. .. id. Bull. U.S. Nat. Mus. No. 54, p. 522.  
 1910. .. id. Wash. Bur. Fish. Doc. 736, p. 37.

#### PSEUDIONE MUNIDAE n. sp.

(Plate XVII. Figs. 26, 27.)

Female.—Head a little wider than long, anterior margin slightly convex, crenulate, "limbe posterior" with hind margin and lateral processes crenulate. Ovarian bosses on first 4 segments. Epimera inconspicuous, antero-lateral angle acutely produced on anterior segments, lateral margin irregularly indented on the posterior segments. Pleon of 6 distinct segments, 6th minute and embraced by 5th, ventral surfaces crossed by longitudinal rugae, pleura developed as lamellae, but not concealing the pleopods, entire, covered with rounded warts.

Antenna 1 3-jointed, basal joint not greatly expanded, not contiguous with its fellow.

Antenna 2 4-jointed, basal joint not greatly expanded.

A pair of large tubes as described by Calman in *P. giardi*.

Maxilliped, anterior portion produced both backwards and forwards on the outside, posterior portion triangular, its antero-interior angle not produced, no palp.

Peraeopods with 3rd joint bulbous, exterior angle of palm produced into a rounded setose lobe on which the curved finger closes.

The 5 pairs of marsupial plates overlap in the centre. The first pair with a blunt posterior process on the distal lobe, no overlapping ridge. Hind margin of the 4th pair minutely setulose, of the 5th strongly setose.

Pleopods lanceolate, becoming slightly shorter posteriorly, outer and inner rami subequal, with small warts, chiefly on the anterior pairs.

Uropods lanceolate with acute apices.

Male.—Lanceolate in outline, head broader than long, anterior margin rounded. Peraeon segments distinct, laterally narrowed, subangular. Pleon abruptly narrower than peraeon, all 6 segments distinct, 6th segment broader than long, hind margin emarginate, postero-lateral angles without setae.

Antenna 1 3-jointed; antenna 2 4-jointed; the basal joints not expanded.

Peraeopods with 3rd joint not bulbous, palm oblique.

Pleopods—there are obscure indications of lobe-like processes on the first 3 segments and possibly on the 4th also.

*Length*: ♀ 9 mm., ♂ 4 mm.; *breadth*: ♀ 6 mm., ♂ 1.5 mm.

*Colour*: In spirit yellowish-white.

*Locality*: Off Buffalo River, East London. 300 fathoms. ♂♂ and ♀♀. s.s. "Pieter Faure." 16/4/01 and 24/4/01. (S.A.M. Nos. A269 and A2273.)

*Host*: *Munida sancti-pauli* Henderson. In the branchial cavity.

Distinguished from *P. crenulata* Sars 1898 by the acute epimera and the rounded pleura in the ♀. The ♂ bears most resemblance to that of *P. giardi* Calman 1898.

#### PSEUDIONE CRENULATA Sars.

1898. *Pseudione crenulata* Sars, Crust. Norw. vol. 2, p. 203, pl. 86, fig. 1.

1900. .. .. Bonnier, Trav. Stat. Wimereux, vol. 8, p. 303.



Female.—Head only very faintly crenulate, “limbe posterieur” with margin entire, the lateral processes not crenulate. Eyes not distinguishable. Ovarian bosses on segments 1-4. Maxilliped with inner distal angle of anterior part not so much produced as in Sars’ figure, without any indication of a palp. First marsupial plate without posterior process on distal lobe, overlapping ridge well developed; posterior margin of plates 2 and 3 setulose, of 4 and 5 strongly setose.

In other respects corresponding with Sars’ description.

*Length*: ♀ 5 mm., ♂ 2 mm.; *breadth*: ♀ 3.5 mm., ♂ 1.5 mm.

*Colour*: In spirit dull pinkish.

*Locality*: Off Port Shepstone, Natal. 24 fathoms. s.s. “Pieter Faure.” (S.A.M. No. A4860.)

*Host*: *Galathea dispersa* Bate. In the branchial cavity.

*Geogr. Distribution*: Coast of Norway. On *Munida rugosa* and *teuimana*. (Sars.)

#### PARAGIGANTIONE n. g.

Female.—Body oval, asymmetrical. Epimera well defined, extending the whole length of the segment, not expanded. Pleon segments distinct. Pleura hiding the pleopods but not expanded, entire. Maxilliped similar to that of *Gigantione*, without palp. All 7 pairs of peraeopods developed. Pleopods biramous, entire, inner ramus larger than outer. Uropods biramous, rami subequal, ovate, not pedunculate.

Male.—Peraeon and pleon segments distinct. A median ventral papilla on peraeon segments 1-6. Pleopods present on segments 1-5, lobe-like. Uropods lamellate, uniramous, ovate.

Parasitic in the branchial cavity.

This genus differs from *Gigantione* in having in the ♀ non-pedunculate uropods, the segments not expanded and the pleopods not fimbriate or fringed. No mention is made of the ventral papillae of the ♂ in any species of *Gigantione*, so that their absence may be reckoned as a characteristic of the genus.

The only other genus in which the ♀ has biramous uropods and the pleon segments of the ♂ are distinct is *Aporobopyroides* Nobili 1906, but in this genus the 5th and 6th pleon segments of the ♂ are fused dorsally and ventrally and there are no pleopods or uropods. The ♂ of *Urobopyrus* Richardson 1904 is unknown.

#### PARAGIGANTIONE PAPILLOSA n. sp.

(Plate XVII. Figs. 28, 29.)

Female.—Head broader than long, anterior margin slightly convex.

“limbe posterieur” entire, the curved process at exterior angle strong. Ovarian bosses absent or not yet developed. Epimera conspicuous, extending whole length of segments. Pleon of 6 distinct segments, pleura entire, only the 4th and 5th strongly produced as lamellae, 5th segment embracing 6th, which is broader than long.

Antenna 1 3-jointed, 1st and 2nd joints stout, 3rd minute, tipped with setae.

Antenna 2 5-jointed, 1st and 2nd joints stout, 3rd and 4th elongate, 5th minute, tipped with setae.

Maxilliped, anterior portion quadrangular, exterior angle rounded, margins setose, posterior portion more semicircular than triangular, inner apical angle acute, ending in a small spine, inner margin setose, palp absent.

Only the first pair of marsupial plates meet in the centre; the others apparently are not fully developed. First pair with the 2 lobes subtriangular and about equal in size, overlapping ridge entire and smooth. Inner and hind margins of 2nd-5th pairs and inner margin of the distal lobe of 1st pair setose.

Pleopods probably not fully developed, inner ramus broadly lanceolate with acute apex, larger than outer ramus, which is quadrate, with the postero-exterior angle a little produced.

Uropods biramous, attached to the lateral angles of 6th pleon segment, rami subequal, ovate, apical margins finely setulose.

Male.—Nearly parallel-sided, anterior margin of head convex. Peraeon segments all distinct, laterally somewhat pointed, 1st with the median ventral papilla pointed, segments 2-6 with the papilla rounded, with a small pit in the middle. Pleon segments all distinct, pleura developed as blunt lamellae, the 5th segment embracing 6th, which is as broad as long, ovate and cleft nearly to the base.

Pleopods on segments 1-5 lobe-like.

Uropods lamellate, uniramous, obovate, extending a little beyond apex of 6th segment, apical margins finely setose.

Length: ♀ 7.5 mm., ♂ 3 mm.; breadth: ♀ 4 mm., ♂ 1 mm.

Colour: In spirit yellowish-white.

Locality: Off Buffalo River, East London. 300 fathoms. 1 ♂ and ♀. s.s. “Pieter Faure.” 24/4/01. (S.A.M. No. A2277.)

Host: *Munida sancti-pauli* Henderson. In the branchial cavity.

GEN. HEMIARTHURUS Giard & Bonn.

1843. *Phryxus* Rathke, Nova Acta Ac. Leop.-Carol. Naturae Curios.  
p. 40.

1887. *Hemiarthrus* Giard & Bonnier (date quoted from Stebbing).  
 1893.        ..        Stebbing, Hist. Crust. p. 417.  
 1898. *Phryxus* Sars, Crust. Norw. vol. 2, p. 214.

HEMIARTHURUS NEMATOCARCINI Stebb.

1914. *Hemiarthrus nematocarcini* Stebbing, Ann. S.A. Mus. vol. 15,  
 pt. 1, p. 47, fig.

The only further remarks necessary concerning this species is that the pleon of the ♀ is subacute and entire. This character distinguishes the species easily from *H. abdominalis* (Kröyer).

FAMILY CYPRONISCIDAE.

1889. *Cyproniscidae* Giard & Bonnier, Trav. Stat. Wimereux,  
 Bopyrieus, p. 221.

GEN. CYPRONISCUS. KOSSM.

1884. *Cyproniscus* Kossmann, SB. K. Ak. Wiss. Berlin. Hft. 22,  
 p. 460.  
 1902.        ..        Stebbing, S.A. Crust. pt. 2, p. 75.

CYPRONISCUS CROSSOPHORI Stebb.

1901. *Cyproniscus crossophori* Stebbing, Knowledge, vol. 24, p. 100.  
 1902.        ..        ..        id. l.c. p. 76, pl. 15B.

Three specimens of the host *Crossophorus africanus* Stebb., from the "Pieter Faure" collection, have been examined for this parasite. In one 2 immature ♀♀ and 3 larvae were found, in another 3 larvae, and in the third 1 adult ♀.

The adult ♀ is symmetrical, flat on the side apposed to the host, convex on the outer side, anterior end narrower than the posterior, shaped therefore like half a pear. About 10 segments are indicated by shallow grooves. No attachment cord was found, the parasite appearing to be quite free in the incubatory pouch of the host. Length: 6.25 mm.; breadth and depth: both 3 mm.

The immature ♀♀ measure ca. 2 × 1.5 mm. and show indications of 7-9 segments. Head with a rudimentary oral cone, and on each side of this a short antenna-like process, which is constricted near the end so as to appear 2-jointed, but there is no suture.

The larvae range from 1-2.25 mm. in length and agree with Stebbing's description. The largest are probably functional ♂♂.

All three hosts were females.

*Locality*: Lion's Head SE.  $\frac{1}{4}$  E., distant 50 miles. 230 fathoms. 1 adult ♀; South Head E. by S.  $\frac{1}{3}$  S., distant 25 miles. 190 fathoms. 2 immature ♀♀ and 6 larvae. (Both localities off the Cape Peninsula.) s.s. "Pieter Faure." 2/4/02 and 3/4/02. (S.A.M. Nos. A4165 and A4166.)

## FAMILY CABIROPSIDAE.

1895. *Cabiropsidae* Giard & Bonnier, Bull. Sci. Fr. vol. 25, pp. 421, 441, 443.

As Stebbing has done in the case of the *Cyprioniscidae*, I keep this family separate for the sake of convenience, although Sars regards it as a part of the *Cryptoniscidae*.

### GEN. CLYPEONISCUS Giard & Bonn.

1895. *Clypeoniscus* Giard & Bonnier, l.c. p. 444.

1899. ,, Sars, Crust. Norw. vol. 2, p. 239.

1905. ,, Richardson, Bull. U.S. Nat. Mus. No. 54, p. 577.

Only two species of this genus are known: *hanseni* Giard & Bonn. and *meinerti* Giard & Bonn., both from the North Atlantic and infesting members of the family *Idoteidae*. Their specific distinctness is doubtful.

Two larval specimens which may belong to this genus were found on a specimen of *Lauocira capensis* (see supra, p. 354).

### CLYPEONISCUS STENETRII n. sp.

Body of ♀ irregularly oval, incised anteriorly and posteriorly, lateral margins with irregular shallow indentations. Dorsal surface moderately convex, the opaque area ovoid but indistinctly defined. Ventral surface with a longitudinal slit extending from the anterior to the posterior incisions, its margins with (so far as it was possible to count them) 10 pairs of marginal folds. These do not appear to be double or to interlock as is the case in *meinerti*.

A single ♂ was found attached to the same host, but is not in a good enough state of preservation to allow of the characters of antenna I, side-plates and peraeopods being observed. The outer ramus of uropod is much shorter than inner.

The structure of the embryos also could not be made out, and in particular it was quite impossible to determine the presence or absence of the ventral plate.

Nevertheless, there is no doubt that this is a species of *Clypeoniscus* in view of the close agreement of the ♀ with *hanseni*. As to specific distinctness, scarcely any character can be found except the (apparently) singleness of the marginal folds on the brood-lamellae. Sars doubts the specific distinctness of the two northern species. These two forms were considered as belonging to two species by Giard & Bonnier in conformity with their assumption that each species of host is infested by its own particular species of parasite. This assumption has been proved to have no foundation in fact, or at least to have many exceptions.

I have instituted a new species for the South African specimens, not in support of the above hypothesis, but in order to indicate the occurrence of the genus on a member of a family different from that on which the northern species are found.

*Length*: ♂ 75 mm., ♀ 2 mm.; *breadth*: ♀ 1.5 mm.

*Locality*: Vasco da Gama Peak N. 71° E., distant 18 miles (off Cape Peninsula). 230 fathoms. ♂ and ♀ attached separately to the ventral surface of the same specimen of *Stenetrium dagama* (see supra, p. 399). s.s. "Pieter Faure." 4/5/00. (S.A.M. No. A4167.)

#### GEN. ET SP. INCERT.

(Text-figs. 1, 2.)

Attached to the ventral side of the peraeon of a ♂ specimen of *Nycthonos capensis* (supra, p. 415) were two minute spherical bodies. They are both evidently ♀♀, but as no larvæ or ♂♂ were present their systematic position is uncertain.

They bear some resemblance to *Munnoniscus* Giard & Bonnier 1895, but this genus possesses no definite fixing apparatus. *Oosaccus* Richardson (Bull. U.S. Nat. Mus. no. 54, p. 582, fig. 644) has no attachment cord, but appears to have a kind of suction-disk composed of a raised rim with 3 or 4 valvular flaps within.

The two specimens in question have the following structure, so far as I have been able to elucidate it. Having only the two specimens, which, moreover, are not exactly alike, I have not resorted to sectioning, but contented myself with mounting them whole in glycerine jelly.

Both are spherical in shape, measuring .5 mm. in diameter. In the one specimen (Fig. 1) there are two little contiguous conical processes,

each bearing a small spine. The spines do not project parallel but diverge outwards, so as to form an efficient fixing apparatus. The interior is completely filled by an opaque mass in which no definite elements can be distinguished. There appears to be no trace of any other structure.

On the other hand the second specimen (Fig. 2) shows no sign of the

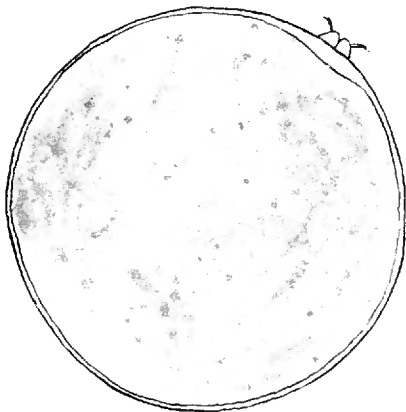


FIG. 1.

× 100.

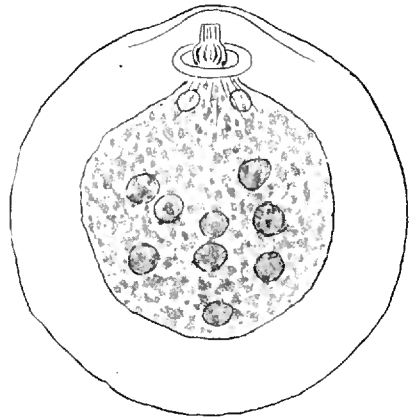


FIG. 2.

two little conical processes, but is attached by means of a kind of proboscis. This appears to be composed of 3 or 4 pieces, which are enlarged at the base, end bluntly and form a closed cylindrical tube. Around the base of this is a ring, the nature of which is difficult to interpret, and below this are seen several strands which may be muscles working the proboscis. The internal mass does not by any means fill up the outer sac. It appears granular, and contains several darker granular masses which are apparently ova. Just below the proboscis are two ovoid structures.

(S.A.M. No. A4131.)

## INDEX.

	PAGE		PAGE
A			
<i>acuta</i> (Cymodoce) . . . . .	366	CRYPTONISCIDAE . . . . .	431
<i>affinis</i> (Cymodoce) . . . . .	366	<i>Cycloithura</i> Stebb. . . . .	361
<i>affinis</i> (Hyarachna) . . . . .	418	Cymodoce Leach . . . . .	362
<i>africana</i> (Cassidias) . . . . .	375	Cymodoceella Pfeffer . . . . .	372
<i>Agathotamais</i> Hansen . . . . .	331	Cymothoa Fabr. . . . .	357
<i>agnihensis</i> (Apsendes) . . . . .	322	CYMOTHOIDAE . . . . .	357
<i>angusta</i> (Janira) . . . . .	404	Cyproniscus Kossm. . . . .	430
<i>Anthura</i> Leach . . . . .	337	D	
ANTHURIDAE . . . . .	337	<i>dagama</i> (Stenetrium) . . . . .	399
<i>Antias</i> Rieb. . . . .	319	<i>dalmecida</i> (Stenetrium) . . . . .	400
<i>Apanthura</i> Stebb. . . . .	339	DESMOSOMIDAE . . . . .	410
<i>Apsendes</i> Leach . . . . .	321	<i>destructor</i> (Sphaeroma) . . . . .	358
APSEUDIDAE . . . . .	321	<i>diazi</i> (Stenetrium) . . . . .	401
<i>Aretopsis</i> (n.g. Astacillidae) . . . . .	386	<i>dimeroceras</i> (Haplomiscus) . . . . .	406
<i>Arcturella</i> Sars . . . . .	389	<i>disjuncta</i> (Gnathia) . . . . .	334
<i>Arcturopis</i> . . . . .	389	<i>Dolichocheilia</i> Stebb. . . . .	331
<i>Artopoles</i> (Brund., n.g. Sphaeromidae) . . . . .	376	<i>dubius</i> (Leptocheilia) . . . . .	332
<i>Astacilla</i> Cordiner . . . . .	386	E	
ASTACILLIDAE . . . . .	384	EUBRANCHIATAE . . . . .	372
<i>australis</i> (Apsendes) . . . . .	323	<i>euelpis</i> (Paratanais) . . . . .	329
<i>avicularia</i> (Apsendes) . . . . .	321	<i>Eugerda</i> Mein. . . . .	410
B			
<i>bacillopsis</i> (Rhabdomesus) . . . . .	413	<i>Eurycope</i> Sars . . . . .	420
<i>bacillus</i> (Astacilla) . . . . .	386	<i>Eurydice</i> Leach . . . . .	319
<i>beddardi</i> (Pseudomunnopsis) . . . . .	416	EURYDICIDAE . . . . .	345
<i>bispinosa</i> (Cymodoce tuberculata var.) . . . . .	364	<i>Exanthura</i> Brund. . . . .	340
BOPYRIDAE . . . . .	424	<i>excavans</i> (Cymodoce) . . . . .	371
<i>borbonica</i> (Cymothoa) . . . . .	357	F	
<i>brevipipes</i> (Arcturella) . . . . .	396	<i>filiformis</i> (Exanthura) . . . . .	340
C			
CABIROPSIDAE . . . . .	431	<i>fluviatilis</i> (Cirolana) . . . . .	346
<i>cancellata</i> (Cymodoceella) . . . . .	372	<i>furcifer</i> (Zuzara) . . . . .	361
<i>capensis</i> (Heterotamais) . . . . .	319	<i>fusiformis</i> (Eurycope) . . . . .	423
<i>capensis</i> (Hychthonos) . . . . .	415	G	
<i>capensis</i> (Lanocira) . . . . .	354	<i>Gnathia</i> Leach . . . . .	332
<i>Cassidias</i> Rieb . . . . .	374	GNATHIIDAE . . . . .	332
<i>cavicola</i> (Cymodoce) . . . . .	370	<i>Gnatholana</i> (n.g. Eurydicidae) . . . . .	352
<i>Cilicaca</i> Leach . . . . .	362	H	
<i>cingulata</i> (Cirolana) . . . . .	350	<i>Haliopasma</i> . . . . .	337
<i>Cirolana</i> Leach . . . . .	345	<i>Haplomiscus</i> Rieb. . . . .	406
<i>Clypeoniscus</i> G. & B. . . . .	431	<i>Hemiarthrus</i> G. & B. . . . .	429
<i>concaivifrons</i> (Parammma) . . . . .	409	HEMIBRANCHIATAE . . . . .	358
<i>Conilorphus</i> Stebb. . . . .	351	<i>Heterotamais</i> Sars . . . . .	319
CORALLANIDAE . . . . .	354	<i>hirsutus</i> (Arcturella) . . . . .	391
<i>corniger</i> (Arcturella) . . . . .	391	<i>Holidotea</i> (n.g. Pseudidoteidae) . . . . .	381
<i>cranchii</i> (Cirolana) . . . . .	346	I	
<i>crassiceps</i> (Hyarachna) . . . . .	419	<i>Hyarachna</i> , Sars . . . . .	418
<i>crassimanus</i> (Stenetrium) . . . . .	404	<i>Hychthonos</i> (n.g. Desmosomidae) . . . . .	414
<i>crenulata</i> (Pseudione) . . . . .	427	<i>ingolfi</i> (Agathotamais) . . . . .	331
<i>crossophori</i> (Cyproniscus) . . . . .	430	<i>Ischnosoma</i> Bedd. . . . .	413
<i>cryptodoma</i> (Cymodoce) . . . . .	368		

	PAGE		PAGE
J.			
JAERIDAE . . . . .	401	<i>Phyrrus</i> Rathke . . . . .	429
Janira Leach . . . . .	404	plesionikae (Palaegyge) . . . . .	425
japonica (Cymodoce) . . . . .	366	Pseudanthura Rich . . . . .	343
K			
Kuphomunna Brnd. . . . .	409	PSEUDIDOIDEAE . . . . .	381
L			
Lanocira Hansen . . . . .	354	Pseudione Kossm. . . . .	426
lateralis (Pseudanthura) . . . . .	344	Pseudomunnopsis Hansen . . . . .	416
latreillei (Cilicea) . . . . .	362	punctata (Paranthura) . . . . .	343
Leptocheilia Dana . . . . .	331	pustulata (Arcturella) . . . . .	394
lifensis (Leptocheilia) . . . . .	332	Q	
lineata (Arcturella) . . . . .	392	quadrata (Eurycope) . . . . .	422
linguicauda (Anthura) . . . . .	338	R	
littoralis (Cirolana) . . . . .	346	raynandii (Livoneca) . . . . .	358
Livoneca Leach . . . . .	357	Rhabdomesus Rich. . . . .	413
longipes (Arcturella) . . . . .	395	rostrata (Kuphomunna) . . . . .	409
M			
Macrostylis Sars . . . . .	411	S	
malleolus (Sphyrapus) . . . . .	328	saldanha (Stenetrium) . . . . .	403
mandibularis (Gnatholana) . . . . .	352	savignyi (Leptocheilia) . . . . .	332
mediterranea (Astacilla) . . . . .	388	sentifrons (Conilorphus) . . . . .	351
meinerti (Cirolana) . . . . .	348	serricauda (Apanthura) . . . . .	339
Mesostenus Sars . . . . .	418	setosa (Astacilla) . . . . .	319
Micronisens Müller . . . . .	319	Sphaeroma Bosc . . . . .	358
minor (Gnathia spongicola var.) . . . . .	334	SPHAEROMIDAE . . . . .	358
munidae (Pseudione) . . . . .	426	Sphyrapus N. & S. . . . .	328
MUNNIDAE . . . . .	408	spiniceps (Macrostylis) . . . . .	411
MUNNOPSISIDAE . . . . .	416	spongicola (Gnathia) . . . . .	332
Munnopsoides Tatters . . . . .	416	stenetrii (Clypeoniscus) . . . . .	431
N			
natalensis (Cymodoce japonica var.) . . . . .	366	STENETRIIDAE . . . . .	398
natalensis (Eurydice) . . . . .	319	Stenetrium Hasw. . . . .	398
natalis (Artopoles) . . . . .	377	sulcifrons (Eurycope) . . . . .	421
nematocarcini (Nemiarthrus) . . . . .	430	T	
Neoarcturus Brnd. . . . .	397	TANAIDAE . . . . .	329
novae-zealandiae (Livoneca) . . . . .	358	terebrans (Sphaeroma) . . . . .	358
O			
ornatus (Arcturella) . . . . .	391	tetrathele (Cymodoce) . . . . .	369
ornatus (Microniscus) . . . . .	319	Trichapseudes (n.g. Apsendidae) . . . . .	325
oudops (Neoarcturus) . . . . .	397	tridens (Trichapseudes) . . . . .	325
P			
Palaegyge G. & B. . . . .	424	tripartita (Cymodoce tuberculosa var.) . . . . .	363
palifrons (Cirolana) . . . . .	349	tuberculosa (Cymodoce) . . . . .	363
papillosa (Paragigantione) . . . . .	428	U	
Paragigantione (n.g. Bopyridae) . . . . .	428	uncinatus (Antias) . . . . .	319
Paramunna Sars. . . . .	408	unicornis (Holidotea) . . . . .	382
Paranthura Bate & Westw. . . . .	343	V	
Paratanais Dana . . . . .	329	VALVIFERA . . . . .	379
Q			
R			
S			
T			
U			
V			
W			
Z			



## EXPLANATION OF PLATES.

## PLATE XV.

FIG.

1. *Apeudes aguthensis* n. sp. Animal enlarged 17 times, peraeopods and uropods omitted.
2. " *australis* n. sp. Animal enlarged 10 times, peraeopods and uropods omitted.
3. *Trichapeudes tridens* n. g. et sp. Animal enlarged 7 times, peraeopods and uropods omitted.
4. " " " Mandible.
5. " " " Maxilliped.
6. " " " Peraeopod 1.
7. " " " Exopod of peraeopod 1.
8. " " " Exopod of peraeopod 2.
9. *Gnathia spongicola* n. sp. Animal enlarged 7 times, antennae and peraeopods omitted.
10. " *disjuncta* n. sp. Animal enlarged 11 times, antennae and peraeopods omitted.
11. *Apanthura serricauda* n. sp. Maxilliped with apical joint further enlarged.
12. " " " Telson.
13. *Pseudanthura lateralis* Rich. Telson and right uropod from above.
14. " " " Antenna 1.
15. " " " Peraeopod 1.
16. " " " Maxilliped.
17. *Cirolana littoralis* n. sp. Frontal lamina.
18. " *meinerti* n. sp. Frontal lamina.
19. " *fluvialis* Stebb. Frontal lamina.
20. " *palifrons* n. sp. Animal enlarged 5 times, peraeopods omitted.
21. " " " Frontal lamina.
22. " *cingulata* n. sp. Animal enlarged 5 times, peraeopods omitted.
23. " " " Frontal lamina.
24. *Gnatholana mandibularis* n.g. et sp. Animal enlarged 6 times, peraeopods omitted.
25. " " " Mandible.
26. *Zuzara furcifer* n. sp. Peraeon segment 7, pleon, telson and right uropod.
27. " " " Epistome.
28. *Cymodoce tuberculosa* Stebb. var. *tripartita* Rich. Pleon and telson with uropods, ♂, setae omitted.

## PLATE XVI.

FIG.

1. *Cymodoce japonica* Rich var. *natalensis* n. Pleon and telson with uropods, ♂, setae omitted.
2. " " " " " The same, ♀.
3. " *tetrathele* n. sp. Pleon and telson with uropods, ♂, setae omitted.
4. " *caricola* n. sp. Pleon and telson with uropods, ♂.
5. " " " " " The same, ♀.

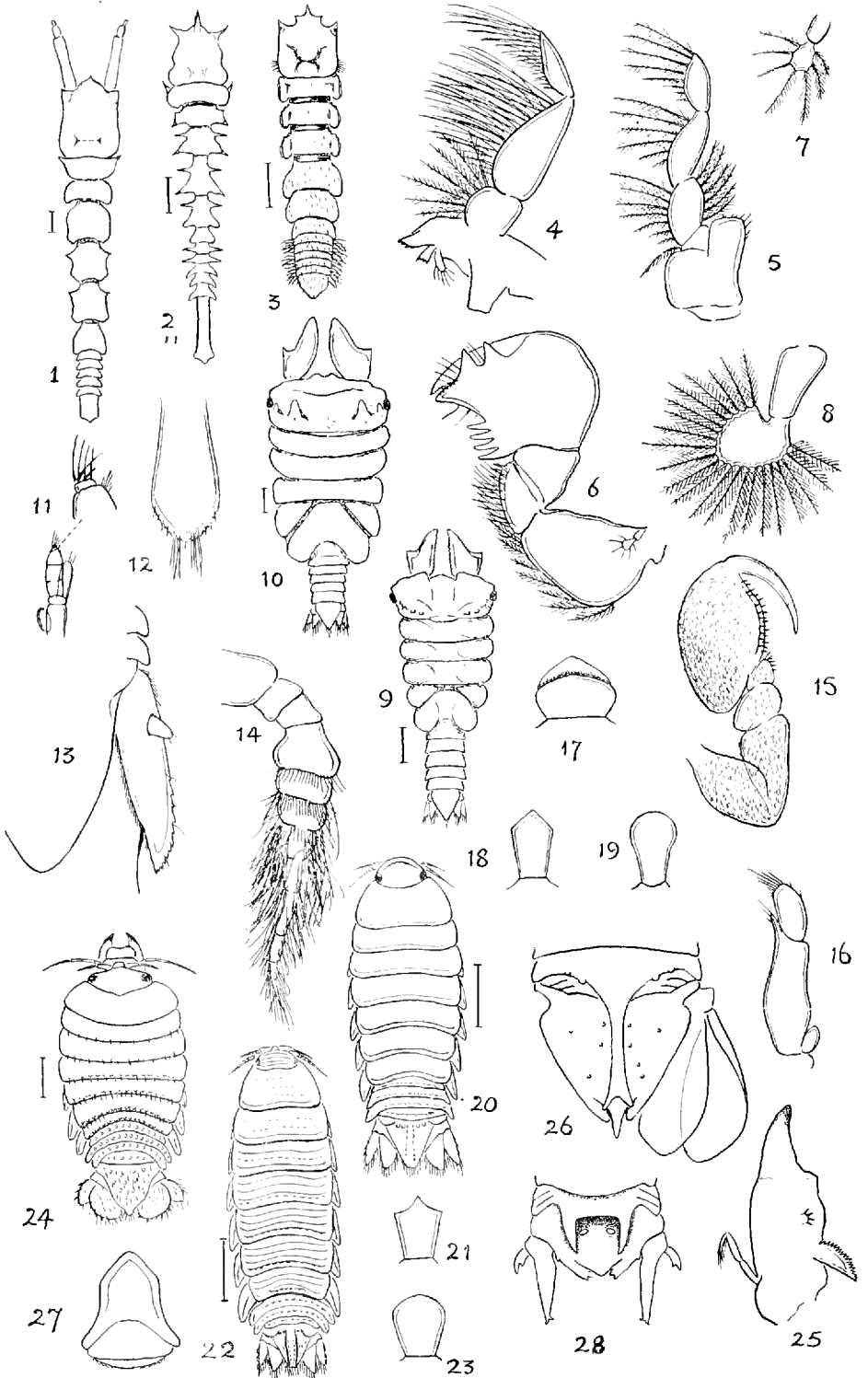
- FIG.
6. *Cymodoce cryptodoma* n. sp. Pleon and telson with uropods, ♂, setae omitted.
  7. " " " The same, ♀.
  8. " *excavans* n. sp. Pleon and telson with uropods, ♂, setae omitted.
  9. " " " The same, ♀.
  10. *Cymodocella cancellata* n. sp. Animal enlarged 7 times, peraeopods omitted.
  11. " " " Lateral view of peraeon segments 5-7, pleon and telson.
  12. " " " Male stylet on pleopod 2.
  13. " " " Epistome.
  14. " " " Male appendages on peraeon segment 7.
  15. *Cassidius africana* n. sp. Pleon and telson with uropods, ♂, dorsal view.
  16. " " " The same in lateral view.
  17. " " " The same, ♀, dorsal view.
  18. *Holidotea micornis* n. g. et sp. ♂ enlarged 6 times, antennae and peraeopods omitted.
  19. " " " ♀ enlarged 5 times.
  20. " " " Head process of ♂ further enlarged, in dorsal and lateral views.
  21. " " " Pleopod 1, ♀.
  22. " " " Pleopod 1, ♂, and male appendage.
  23. " " " Peraeopod 1.
  24. *Arcturella pustulata* n. sp. ♀ enlarged 5 times, antennae and peraeopods omitted.
  25. " *longipes* n. sp. ♀ enlarged  $4\frac{1}{2}$  times, only the left peraeopod 4 drawn in.
  26. " " " ♂ enlarged  $4\frac{1}{2}$  times, antennae and peraeopods omitted.
  27. " *brevipes* n. sp. ♀ enlarged  $4\frac{1}{2}$  times, only the right peraeopod 4 drawn in.
  28. *Steneltrium dagana* n. sp. Peraeopod 1, ♂.
  29. " " " Pleopod 1, ♂.
  30. " *diazi* n. sp. Peraeopod 1, ♂.
  31. " " " Peraeopod 1, ♀.
  32. " " " Pleopod 1, ♂.
  33. " *soldanha* n. sp. Peraeopod 1, ♂.
  34. " " " Pleopod 1, ♂.

PLATE XVII.

- FIG.
1. *Janira angusta* n. sp. Animal enlarged 14 times, peraeopods omitted.
  2. " " " Peraeopod 1, ♂.
  3. " " " Pleopod 1, ♂.
  4. *Haploniscus dimeroceras* n. sp. ♂ enlarged 15 times.
  5. " " " Pleopod 1, ♂.
  6. " " " Pleopod 2, ♂.
  7. " " " Antenna 2, ♂.
  8. *Paramunna concavifrons* n. sp. Head, and left antenna 1.

FIG.

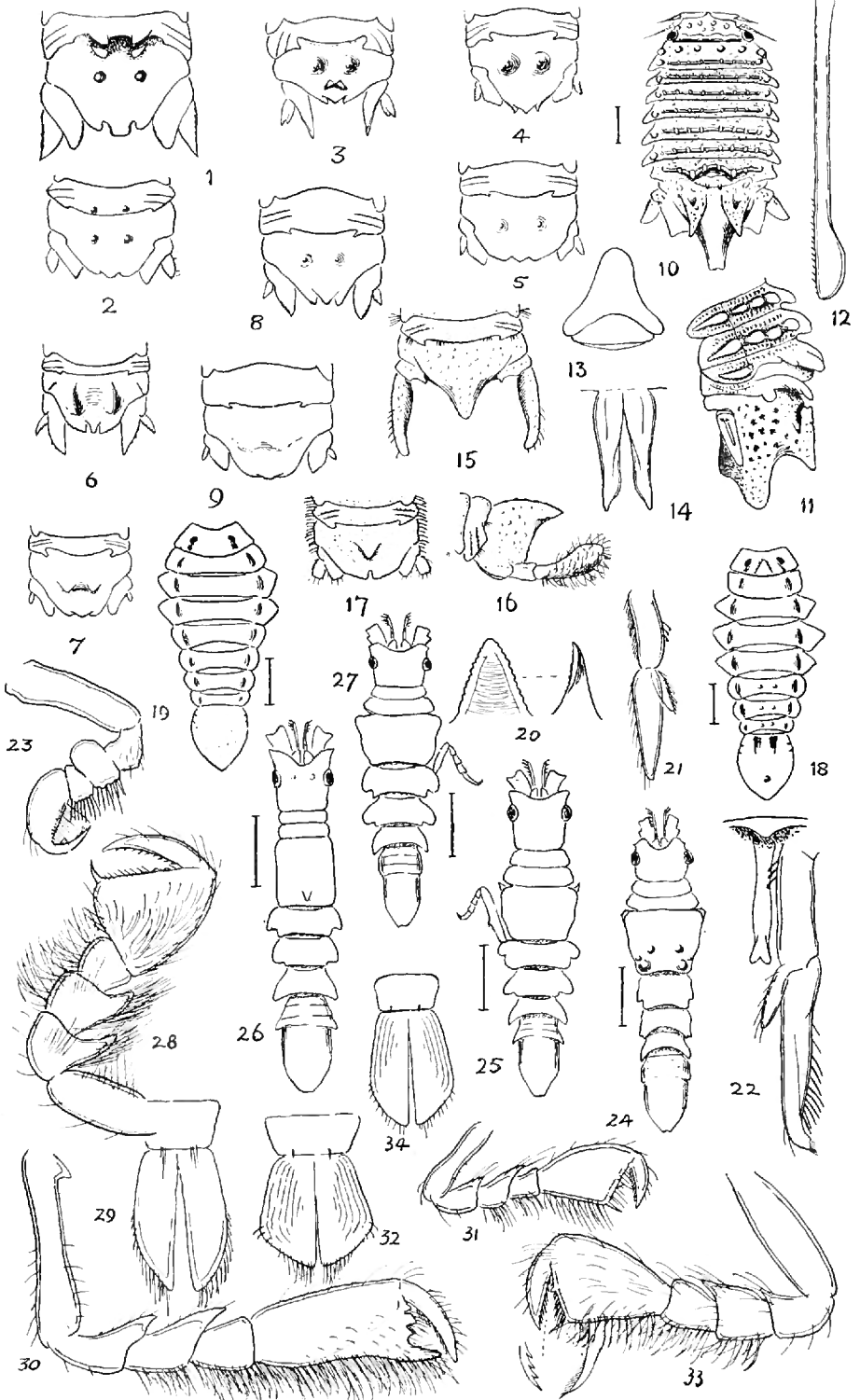
9. *Paramunna concavifrons* n. sp. Peraeopod 1.  
 10. *Macrostylis spiniceps* n. sp. Animal enlarged 13 times, with antenna 1, but without peraeopods.  
 11. " " " Pleopod 1, ♂ with apex further enlarged.  
 12. " " " Pleopod 2, ♂.  
 13. *Rhabdomesus bacillopsis* n. sp. Animal enlarged 10 times, with antenna 2 and peraeopods, as far as preserved, drawn in.  
 14. *Ilychthonos capensis* n. g. et sp. Animal enlarged 8 times, antenna 2 and peraeopods omitted.  
 15. " " " Pleopod 2, ♂.  
 16. " " " Pleopod 1, ♂.  
 17. *Pseudomunopsis beddardi* (Tatt.). Pleopod 2, ♂.  
 18. " " " " Pleopod 1, ♂, with apex further enlarged.  
 19. *Eurycope fusiformis* n. sp. Animal enlarged 10 times, antenna 2 and peraeopods omitted.  
 20. " *quadrata* n. sp. Pleopod 2, ♂.  
 21. " " " Pleopod 1, ♂.  
 22. " *sulcifrons* n. sp. Pleopod 1, ♂.  
 23. " " " Pleopod 2, ♂.  
 24. *Palaeogyge plesionikae* n. sp. ♀ enlarged 3 times, dorsal view.  
 25. " " " ♂ enlarged 14 times, ventral view, peraeopods omitted.  
 26. *Pseudione munitae* n. sp. ♀ enlarged 3½ times, dorsal view.  
 27. " " " ♂ enlarged 11½ times, ventral view, peraeopods omitted.  
 28. *Paragiantione pupillosa* n. g. et sp. ♀ enlarged 5½ times, dorsal view, with terminal pleon segment and uropods further enlarged.  
 29. " " " ♂ enlarged 14 times, ventral view, with terminal pleon segment and uropods further enlarged, peraeopods omitted.



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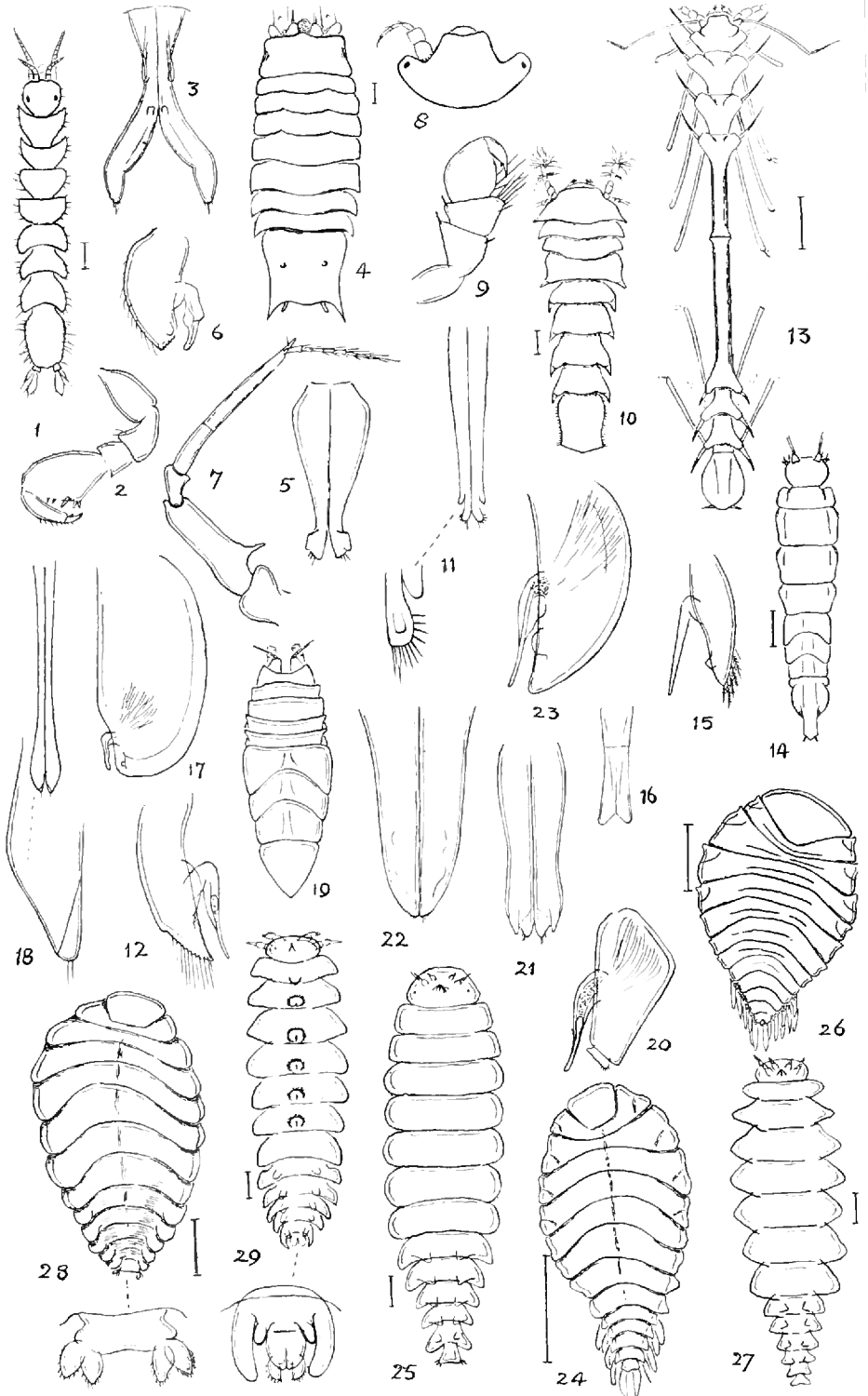
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