

11.—*Contributions to the Crustacean Fauna of South Africa.*—

By K. H. BARNARD, M.A., *Assistant.*

(Plates XVII.—XXIV.)

NOTE.

In deference to Mr. Stebbing, I make the following alterations in the gender of the specific names so as to bring them into conformity with the names on the plates :—

p. 201, for *Gnathia africana*, n.sp., read *Gnathia africanus*, n.sp.

p. 203, for *Idotea metallica*, Bosc., read *Idotea metallicus*, Bosc.

p. 204, for *Engidotea lobata* (Miers) read *Engidotea lobatus* (Miers).

Where the gender of the generic name is doubtful, the uniform plan of making the specific name masculine is advantageous, but I do not bind myself to extend the principle to *all* specific names, whether the gender of the genus is doubtful or not; unless of course the principle be adopted generally by scientists in all branches of zoology.

I wish to express my thanks to Mr. Stebbing for kindly passing the plates through the press.

K. H. B.

5th February, 1914.

1896. " G. O. Sars, *Crust. Norw.* ii. pt. 1, p. 10.
1900. " Stebbing, in *Wiley's Zool. Res.* pt. 5, p. 613.

11.—*Contributions to the Crustacean Fauna of South Africa.*—

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(Plates XVII.—XXIV.)

I.—ADDITIONS TO THE MARINE ISOPODA.

(Plates XVII.—XXIV.)

The following paper contains descriptions of thirteen species and one variety of Marine Isopods, all from the collections in the South African Museum. One genus, ten species, and one variety are described as new. One species, known only from a dried specimen in the British Museum without locality, also requires the institution of a new genus. The males of two species, of which only the females were previously known, are described for the first time.

In addition the records of four species already known, but which were omitted from the General Catalogue of South African Crustacea (Stebbing, Ann. S.A.M. vol. vi. pt. 1, 1910) are inserted.

A note of the occurrence of *Iais pubescens* (Dana) and the description of the male will be incorporated in a future paper along with the notes on the Sphaeromid hosts which it inhabits.

To Rev. T. R. B. Stebbing, F.R.S., are due my very best thanks for his kindly advice on several points and the addition of references which I had overlooked.

FAMILY TANAIIDAE.

1853. *Tanaidæ* (part), Dana, U.S. Expl. Exp. vol. 13, p. 792.
1886. " Norman and Stebbing, Tr. Zool. Soc. Lond.
 12, p. 102.
1896. " G. O. Sars, Crust. Norw. ii. pt. 1, p. 10.
1900. " Stebbing, in Willey's Zool. Res. pt. 5, p. 613.

GEN. TANAIS, Andouin and M. Edwards.

1828. *Tanais*, Andouin and M. Edwards, Précis d'Entomologie, vol. 1, p. 46, pl. 29, fig. 1.
 1832. *Anisochairus*, Westwood, Ann. Sci. Nat. vol. 27.
 1836. *Zeuxo*, Templeton, Tr. Entom. Soc. vol. 2, p. 201.
 1843. *Crossurus*, Rafinesque, Fauna Norwegens, p. 35.
 1886. *Tanais*, Beddard, Challenger Rep. vol. 17, pt. 48, p. 119.
 1905. „ Stebbing, in Herdman's Ceylon Pearl Fish. Suppl. Rep. 23, p. 2.
 1905. „ Richardson, Bull. U.S. Nat. Mus. No. 54, p. 7.

TAN AIS SPONGICOLA, n. sp.

(Plate XVII. A.)

Body evenly cylindrical, smooth with the exception of a few hairs along the anterior margins of the peraeon segments.

Head longer than its greatest width, eyes small but distinct, situated on and forming the antero-lateral angles, front margin between them flatly angular.

First segment of peraeon visible only at sides, second (first free) segment narrow, the following ones gradually increasing in length, but in none of them does the length equal the breadth, none of the side-plates except the first as long as their respective segments, the first acutely produced anteriorly.

Pleon composed of 6 distinct segments, lateral margins rather densely setose, 4th and 5th segments not markedly narrower than 1st-3rd, 6th segment broader than long, apex rounded, with 3-4 setae, a median groove on postero-inferior face.

First antenna, 1st joint 5 times as long as broad, 2nd joint a little more than one-fourth length of 1st, 3rd joint one-third length of 2nd, 4th joint (= flagellum) minute, with strong brush of setae.

Second antenna about as long as first antenna, 1st joint a little longer than 3rd, its margins minutely serrulate, 2nd joint a little shorter than 4th, which is half the length of 3rd, 5th joint minute, with strong brush of setae.

Upper lip bluntly rounded, with thick fringe of setae, epistome narrow, strongly calcified.

Lower lip, outer lobes indented on exterior margin, lower portion spinulose on margin, apex with a minute setulose "palp," inner lobes as long as but not as broad as outer, evenly rounded, apices setulose.

Mandibles stout, apex bifid in the left mandible, in the right entire, with 2 minute spines on inner side a little below apex, molar prominent, denticulate.

First maxilla, masticatory lobe curved, outer margin serrulate, apex with ca. 9 non-serrate spines and a bunch of setae external to them, backward-bent "palp" ending in several setae (3-8).

Second maxilla tooth-like, apparently only 1-jointed, with broad basal portion, distal half suddenly narrowed, pointed.

Maxillipeds, 1st joint short with 3 long spines on inner margin, 2nd joint stout, $1\frac{1}{2}$ times as long as broad, outer margin distally serrulate, 3rd and 4th joints subequal, outer margin of 3rd joint serrulate, 5th joint a little longer, 6th joint narrow, with apical setae, inner plate reaching to middle of 4th joint, apex rounded, setose, inner apical angle with 1-2 long curved setae (coupling-hooks), epiped apparently absent (6 specimens were examined and no trace of it could be found).

First gnathopod ♂, thumb of propodos with incisive edge extending from apical tooth to hinge, where it ends in a prominent tubercle, at distal end a row of setae along its base, finger strongly curved, very slightly thickened before the apical tooth, which fits within that on the thumb.

First gnathopod ♀, not quite so stout as in ♂, thumb of propodos with the incisive edge extending from apical tooth half-way along thumb, a small setiferous tubercle near hinge, finger not much curved, slightly bulbous at base internally, with apical tooth fitting within that on the thumb.

Second gnathopod ♂, ambulatory, 2nd joint longest, 3rd joint shortest, 4th joint shorter than 5th, which is a little over half length of 2nd, 6th slender bearing a slender spiniform unguis as long as itself.

Second gnathopod ♀, similar but not so elongate.

First and second peracopods, stouter and longer than second gnathopod, 2nd joint cylindrical, 3 times as long as broad, 3rd joint half length of 2nd, 4th joint a little shorter, with ca. 6 strong apical spines, 5th joint equal to 3rd, 6th joint with its slender nearly straight unguis half length of 5th, posterior margins of 3rd, 4th, and 5th joints serrulate.

Third-fifth peracopods stouter than 1st and 2nd peracopods, 2nd joint fusiform, twice as long as broad, 3rd and 4th joints subequal, shorter than 5th, 3rd joint with 1 apical spine on inner margin, 4th joint with ca. 6 strong apical spines, 6th joint rather more than half length of 2nd, with a strong falciform unguis.

Marsupial pouches arising from bases of pereopods 3, and extending from segment 4 to segment 7.

First and second pleopods, outer margin of peduncle with 5 plumose setae, inner ramus smaller than outer with 3 plumose setae on its inner margin (away from outer ramus) and an apical spine-seta.

Third pleopods similar, but peduncle has only 2 setae, and inner ramus only 1 seta.

Uropods as long as last 3 pleon segments combined, 6-pointed, the 1st joint considerably stouter than the rest, 6th joint minute, with long terminal setae.

Length: 5.5 mm.

Colour: Whitish with slaty-grey mottlings, the head and a medio-dorsal spot on the pereon segments markedly darker than the rest of the body.

Locality: St. James, False Bay. 29/4/12. (Coll. K.H.B.) In holes in encrusting sponges (*Halichondria*) and compound Ascidians, low tide. ♂♂ and ♀♀ (with ova). (S.A.M. No. A2105.)

This species belongs to *Tanais sensu lato*, in that it has 6 pleon segments and not 5 as in *Tanais sensu stricto* (Sars, 1896). In general shape and the possession of 6-jointed uropods it resembles most nearly *T. normani*, Richardson, 1905, but differs in the form of the first gnathopods of the male: *T. normani* has the finger and thumb not widely separated (*i.e.*, the finger is not strongly curved), whereas in *T. spongicola* they are widely separated, as is the case in *T. robustis*, Moore, 1894. The 6-jointed uropods distinguish it also from *T. gracilis*, Heller, 1866.

FAMILY GNATHIIDAE.

1880. *Gnathiidae*, Harger, Rep. U.S. Comm. Fish. pt. 6, p. 408.
 1886. *Ancidae*, Boddard, Challenger Rep. vol. 17, p. 135.
 1897(-1899). *Gnathiidae*, G. O. Sars, Crust. Norw. ii, p. 50.
 1901. *Gnathiidae*, Dollfus, Bull. Soc. Zool. France, xxvi, p. 240.
 1905. " Richardson, Bull. U.S. Nat. Mus. No. 54, p. 55.
 1909. " id. Proc. U.S. Nat. Mus. vol. 35, p. 483.
 1913. " Stebbing, Trans. Zool. Soc. London, vol. 20, pt. 4, p. 231.

GEN. GNATHIA, Leach.

1814. *Gnathia*, Leach, Edinb. Encycl. vol. 7, p. 402.
1855. *Anceus*, Hesse, Comptes rendus, Novembre 26.
1858. „ id. Ann. Sci. Nat. ser. 4, vol. 9, p. 93.
1863. „ id. Mém. Savants étrangers, vol. 18, pp. 263, 268.
1874. *Anceus*, id. Ann. Sci. Nat. ser. 5, vol. 19, Art. 8, p. 8.
1885. *Anceus*, Haswell, Proc. Linn. Soc. N.S.W. vol. 9, pt. 4,
p. 1005.
1886. „ Beddard, l.c. p. 135.
1900. *Gnathia*, Stebbing, in Willey's Zool. Res. pt. 5, p. 625 (with
synonymy).
1902. „ Hodgson, Nat. Hist. of the "Southern Cross," p. 241.
1905. „ Stebbing, in Herdman's Ceylon Pearl Fish. Suppl.
Rep. 23, p. 8.

GNATHIA AFRICANA, n. sp.

(Plate XVII. B.)

Head broader than long, with 2 diverging ridges running from the middle of posterior margin to the antero-lateral angles, having above the eyes one prominent tooth and some minor crenulations; in front of these ridges the head is concave, anterior margin slightly convex and divided apically into 2 bifid lobes with a tuft of setae at their base.

Peraeon, second segment not quite equalling the greatest breadth of head, laterally quadrate (viewed dorsally), third segment laterally rounded, posterior margin excavate, fourth segment separated from third by a marked constriction, divided dorsally into two halves by a longitudinal depression, fifth segment undivided, sixth segment nearly three times as long as any of the other segments, narrow at base and widening distally, deeply concave between the rounded postero-lateral angles, seventh segment inconspicuous.

Plecon almost equalling peraeon in length, telsonic segment as broad as long, apex pointed, with 2 setae.

Larva of the usual form, the fourth and sixth peraeon segments indicated dorsally and laterally on the enlarged portion by stronger and more deeply coloured cuticle, fifth segment only indicated at the sides.

First antenna ♂, 1st joint longer than 2nd, 3rd joint longer than 1st, flagellum with 1st joint very short, 2nd joint longest, last three small, inconspicuous, with sensory filaments.

Second antenna ♂, a little longer than first antenna, 3rd and 4th joints longest, setose, flagellum 7-jointed, sparsely setose.

Mandibles ♂, arcuate, inner margin below the smooth upturned apex with about 5 blunt teeth, a well-marked notch on outer margin.

Maxillipeds ♂, 2nd joint not produced distally, 4th joint of palp not incurved, outer margin with stiff setae.

Gnathopod ♂. 1st joint tapering, inner margin setose, 2nd joint small with apical tuft of setae.

Peraeopods all similar, rather stout, 4th and 5th joints expanded on front margin, 4th joint more so than the 5th; 3rd, 4th, and 5th joints have prominent tubercles on posterior margin, 6th joint as long as 3rd, with 2 groups of 3 blunt tubercles and 1 blunt spine on inner margin, 7th joint half length of 6th with minute tooth at the base of the prominent unguis.

Pleopods, rami longer than peduncle, rami of first pleopods narrower than the others, all tipped with long setae.

Uropods, outer ramus a little shorter and narrower than inner, both with long setae.

In the larva the mandibles are rather pointed, inner margin straight with the denticulations increasing in size proximally.

First and second maxillae are simple curved appendages, the first shorter than the second.

Maxillipeds well developed, half-way along inner margin of the large basal joint is a narrow blunt lobe, and at the apex two small lobes, the outer blunt and tipped with setae, the inner pointed, with three minute teeth on its inner margin.

Gnathopod short, apparently only 3-jointed with a strong falciform unguis; the 1st, 2nd, and 3rd joints are denticulated on inner margin, the points of the denticulations facing proximally, those on 2nd joint sharper and more distinct than the others.

Length: ♂ 4 mm.; larva 3.5 mm.

Colour: Yellowish grey, with darker mottlings along margins of head and on dorsal parts of peraeon and pleon.

Locality: St. James, False Bay. 29/4/12. (Coll. K.H.B.) One ♂ and 2 larvae on Holothurians in rock-pools, low tide. (S.A.M. No. A2553.)

Mr. Stebbing has favoured me with the following note on the affinities of this species:—

"*Anceus forficularius*, Risso, 1816, *Anceus rapax*, Milne Edwards, 1840, and *Anceus vorax*, Lucas, 1849, all make a near approach to the present form, but offer more or less trustworthy marks of distinction."

FAMILY IDOTEIDAE.

For synonymy see Stebbing, S. Afr. Crust. pt. 1, p. 51, 1900, and pt. 2, p. 55, 1902.

GEN. IDOTEA, J. C. Fabricius.

1798. *Idotea*, Fabricius, Suppl. Ent. Syst. p. 302.
1881. „ Miers, Journ. L. S. Lond. vol. 16, p. 19. (Synonymy.)
1910. „ Stebbing, Gen. Cat. S. Afr. Crust. Ann. S.A. Mus. vol. vi. pt. 1, p. 432.

IDOTEA METALLICA, Bosc.

1802. *Idotea metallica*, Bosc. Hist. Nat. Crust. vol. 2, p. 179, pl. 15, fig. 6.
1840. „ *rugosa*, M. Edw. Hist. Nat. Crust. vol. 3, p. 191.
1846. „ *robusta*, Kröyer, Naturh. Tidsskr. (2) vol. 2, p. 108.
1847. „ *compacta*, White, List. Crust. Brit. Mus. p. 95.
1853. „ *argentea*, Dana, U.S. Expl. Exp. vol. 14, p. 698, pl. 46, fig. 1.
1881. „ *metallica*, Miers, Journ. L. S. Lond. vol. 16, p. 35. (Further synonymy.)
1905. *Idothea metallica*, Richardson, Bull. U.S. Nat. Mus. No. 54, p. 362, figs. 392, 393.

(Omitted from the Gen. Cat. S. Afr. Crust. 1910.)

A cosmopolitan species. The Paris Museum possesses a series from the Cape of Good Hope (teste Miers).

Cape Point NE. 28 miles. Surface. Flesh Point W. by N. $\frac{1}{3}$ N. distant $4\frac{1}{2}$ miles. Surface. s.s. "Pieter Faure." 21/6/03 and 30/12/03.

One specimen cast on beach at Chinde, mouth of the Zambezi. 29/10/12. (Coll. K.H.B.)

ENGIDOTEA, n. g.

Side-plates distinct in all peraeon segments except the first, and as long as their respective segments. Pleon consisting of two segments with two pairs of lateral sutures. Second antennae with multiarticulate flagellum. Maxillipeds 7-jointed. Inner plate of first maxilla with two plumose setae. Uropods with only one branch.

Resembles *Glyptidotea* in the character of the side-plates, and

Paridotea as regards the composition of the pleon; but differs from both in having only two plumose setae on the inner plate of the first maxilla.

ENGIDOTEA LOBATA (Miers).

(Plate XVII. C.)

1847. *Idotea lobata*, White, List. Cr. Brit. Mus. p. 95, descript. nulla.

1851. " " Miers, J. Linn. Soc. Lond. vol. 16, p. 57, plate ii. figs. 8, 9.

Described from one dry specimen in the British Museum, without locality.

Two specimens, 1 ♂ and 1 immature (♀?), in the South African Museum (No. 8824) agree with Miers' description, except in a few minor details, which may be due to their larger size.

First antenna reaches only to the extremity of the ante-penultimate peduncular joint of second antenna, flagellum with ca. 15 groups of setae.

Second antenna extends only to the posterior margin of second peraeon segment; flagellum in the smaller specimen 10-jointed, in the larger 12-jointed.

The mouth parts, not described by Miers, are as follows:—

Epistome transverse, hardly flanking the labrum, which is twice as broad as long, with hairs on the rounded angles but not in the centre.

Lower lip, lobes quadrate, inner angles rounded, with stout setae and smaller setules.

Mandibles, short and stout, cutting edge with 4 teeth, secondary cutting edge with 3 teeth, molar denticulate, spine-row with ca. 5 plumose spines.

First maxilla, outer plate with 10 spines, inner plate with 2 plumose setae and a minute setule.

Second maxilla is remarkable in having only 2 lobes (in both specimens), the outer with 5-6 minutely serrate spines, the inner with about 12 spines and, on the inner apical angle, 2 long stout plumose setae.

Maxillipeds 7-jointed, 7th joint much smaller than 6th, inner plate with about 10 apical spines and one strong coupling-hook, epipod lanceolate, slightly curved inwards.

First peraeopods (gnathopods), 6th joint with 2 stout serrate spines on inner margin; 6th joint of the other peraeopods with one serrate spine before the middle. Seventh joint in all the peraeopods strongly biunguiculate.

Male stylets on 7th pereon segment contiguous, straight, slightly narrowed distally, with blunt apices.

First and second pleopods with 6 hooked setae on inner apex of peduncle.

Penial filament on the second pleopod nearly half as long again as rami.

No plumose seta representing the outer ramus of the uropod.

Length: 17 and 13 mm.; *breadth*: 6 and 5 mm.

Colour: In spirit, straw-colour, with minute dots, chiefly visible on the side-plates and pleon. A dark narrow medio-dorsal streak on pereon, dividing on segments 1, 4, 7 to enclose an oval space rather lighter than the rest of the ground-colour.

Locality: St. James, False Bay, on seaweed in rock-pools. (Dr. W. F. Purcell and Mrs. Purcell, Feb.-April, 1901.)

GEN: SYNDOTEA, Harger.

For synonymy see Stebbing, *S. Afr. Crust.* pt. 2, p. 59, 1902.

SYNDOTEA SETIFER, n. sp.

(Plate XVIII. A.)

Body nearly parallel-sided, but tapering posteriorly, smooth. Head with prominent antero-lateral angles, the margin between them deeply excavate.

Eyes large, prominent.

Side-plates completely fused with their segments; inferior margin of 2nd and 3rd segments strongly angulat, of 4th-7th segments straight.

Pleon of two segments, the terminal one slightly narrower than the first, sides slightly convex and converging distally, apex emarginate, lateral angles acute.

First antenna stout, 2nd and 3rd joints not very much more slender than 1st, 4th joint a little longer than 2nd and 3rd combined, narrowing distally and fringed with about 9 tufts of setae, with a longer terminal seta.

Second antenna, ultimate joint of peduncle rather shorter than the two preceding joints combined, flagellum 17-jointed, peduncle with long scattered setae.

Epistome not broader distally than upper lip, which is rather asymmetrically bilobed at the apex and fringed with long setae.

Lower lip as in *S. hirtipes*, inner margin strongly fringed.

Mandibles, cutting-edge in the left 4-toothed, in the right 3-toothed, secondary cutting-edge 3-toothed, stronger in the left than in the right, spine-row with 7 serrate spines in both mandibles, molar prominent, denticulate, with setae on posterior margin.

First maxilla, outer plate with 10 not very stout, serrate spines, inner plate with 2 long plumose setae.

Second maxilla as in *S. hirtipes*.

Maxillipeds as in *S. hirtipes*, but the epipod is symmetrically bevelled off on both inner and outer margins, instead of having an inward sloping apical margin.

Pereopods with long scattered setae, uniunguiculate. First pereopods (gnathopods) rather stouter than the others, 5th joint with two small and indistinct tubercles on anterior margin, 6th joint expanded. Pereopods 2-7, 5th and 6th joints with 3-4 tubercles on anterior margin. Pereopods 6 and 7, 6th joint with 2 strongly serrate spine-setae at the apex of inner margin.

Cropods, peduncle without oblique ridge, ramus not more than one-third length of peduncle, as broad as long, apex transversely truncate, outer angle rounded, 3 long plumose setae at outer apical angle of peduncle.

Length: 15 mm.; breadth: 4 mm.

Colour: In spirit, dull pinkish.

Locality: 33° 3' S. lat. 27° 57' E. long. 32 fathoms. s.s. "Pieter Faure." 28/12/98.

One specimen, apparently an immature ♀. (S.A.M. No. A20.)

FAMILY ASTACILLIDAE.

To the list of references given by Stebbing: S. Afr. Crust. pt. 4, p. 50, 1908 (Ann. S.A.M. vol. vi. pt. 1), may be added:—

1911. *Arcturidae*, Koehler, Bull. Inst. océan. Monaco, No. 214, p. 1.

GEN. ARCTURUS, Latreille.

1829. *Arcturus*, Latreille, in Cuvier, Règne Animal, 2nd ed. iv. p. 139.
 1886. „ Beddard, Challenger Rep. vol. 17, p. 85.
 1893. „ Stebbing, Hist. Crust. p. 370.
 1904. „ Whitelegge, Sci. Res. Exp. "Thetis," pt. 7, p. 406.
 1905. „ Richardson, Bull. U.S. Nat. Mus. No. 54, p. 327.
 1910. „ id. Proc. U.S. Nat. Mus. vol. 37, p. 97.

ARCTURUS (?) CORNIGER, Stebbing.

1873. *Arcturus corniger*, Stebbing, Ann. Mag. Nat. Hist. (4), xii.
p. 96, pl. 3a, fig. 2.

1908. " " id. S. Afr. Crust. pt. 4, p. 51.

Locality: Port Elizabeth.

This species (which was omitted from the General Catalogue of S.A. Crustacea, Stebbing, 1910) bears a strong likeness to the species of *Arcturopsis* as regards the relative size of the 4th peraeon segment. The "marsupial pouch of the fourth segment has a row of tubercles below the hinge-line," but the number of pairs of marsupial pouches is not given.

The pleon, judging from the figure, consists of one segment with lateral indications of another fused with it.

The male is unknown, unless it is perhaps the following species, which was taken at same place and time.

Stebbing (l.c.) remarks that this species should probably be referred to *Arctuwella*, but this was before Koehler instituted *Arcturopsis*. Its true position can therefore only be ascertained by the discovery of the male and the determination of the absence or presence of the ♂ appendage on the 3rd (or 5th) peraeon segment.

ARCTURUS (?) LINEATUS, Stebbing.

1873. *Arcturus lineatus*, Stebbing, Ann. Mag. Nat. Hist. (4), xii.
p. 97, pl. 3a, fig. 3.

1875. " " id. *ibid.* (4), xv. p. 187.

Locality: Port Elizabeth.

(This species was also omitted from the Catalogue).

The sex is not stated. If a female it can hardly belong to the genus *Arcturopsis*, owing to the absence of lateral protuberances on the 4th peraeon segment.

GEN. ARCTUROPSIS, Koehler.

1911. *Arcturopsis*, Koehler, l.c. p. 8.

ARCTUROPSIS HIRSUTUS, n. sp.

(Plate XIX. A.)

Sexual dimorphism, as usual in this genus, well marked. Head smooth in ♂, in ♀ with 2 setiferous tubercles between the eyes and

2 rather larger ones just behind these, anterior margin semicircularly excavate, antero-lateral angles subtruncate, eyes prominent, sub-triangular, dark.

Peraeon segments 1-3 subequal in length, smooth in ♂, in ♀ with 1 median setiferous tubercle. The first segment has the antero-lateral angles produced almost to the vertical from the hind margin of the eyes, where it meets a downward projection of the head (cheek).

Fourth peraeon segment in ♂ 6 times as long as 3rd, cylindrical, smooth with low inconspicuous median tubercle on posterior margin, in ♀ not quite 6 times as long as 3rd, broadest in front where the lateral margins are expanded to form a tubercle, posteriorly the margin forms an expanded denticulated wing, dorsum with 2 large setiferous bosses in front, behind these a blunt median spine and on the posterior margin 2 longer blunt spines. These spines are usually very feebly setose, especially the median one, but in the single specimen from False Bay all three bear strong tufts of setae.

Peraeon segments 5-7 larger than the first three, the 5th rather larger than 6th or 7th, smooth in ♂ with low median tubercles, in ♀ with stronger setiferous tubercles.

Side-plates not marked on first segment, on the 2nd and 3rd small in ♂ but large and tubercular in ♀, on the 4th small and indistinct in both sexes, on 5th 6th and 7th large and tubercular in both sexes.

The above applies to the ovigerous ♀. The young ♀ has less prominent non-setose dorsal tubercles.

Pleon composed of 3 short basal segments and the long telson, all completely fused, the junctions being marked by furrows only, smooth and glabrous in both sexes.

First antenna, reaching almost to the middle of 3rd joint of second antenna, 1st joint broad, bluntly produced on inner margin, 2nd and 3rd joints subequal, flagellum as long as peduncle, broadest a little way from base, then tapering to a blunt apex, with apical tuft of setules, and long marginal sensory filaments ca. 15 in ♂, ca. 10 in ♀.

Second antenna, 1st and 2nd joints short, 3rd joint equal to 1st and 2nd together, 5th joint equal to 2nd and 3rd together, 4th joint a little longer, inner and lower surfaces of 3rd and, to a less extent, 4th joints with short blunt tubercles in ♂, smooth in ♀, flagellum half length of 5th peduncular joint, its 1st joint long, 2nd joint one-quarter length of 1st, 3rd joint one-third length of 2nd, junction between 2nd and 3rd obscure, 3rd joint bearing a strong apical

tooth, inner margins of all 3 joints with close-set sharp teeth and a few scattered setae.

Epistome not broader than upper lip, which is twice as broad as long and asymmetrically bilobed, with fringe of setae.

Lower lip, lobes short and stout, apices rounded truncate. Mandibles, cutting-edge quadridentate, secondary cutting-edge tridentate in left, bidentate in right, spine-row with 3 spines in left, 2 in right, molar prominent, bifid and strongly denticulate in right, entire in left.

First maxilla, inner plate with 3 stout plumose setae and a minute spinule, outer plate with 9 spines serrate on their outer edges.

Second maxilla, outer plate with 4 serrate spines, narrower than middle plate which has 5 serrate spines, inner plate nearly twice as broad as other two plates together, with numerous plumose setae.

Maxillipeds σ , 1st 5th and 6th joints expanded internally, 7th joint short and stout, inner plate truncate, with 1 strong coupling-hook set a little within the inner margin, inner margins when in situ are bent inwards, and fringed with stout plumose setae, epipod ovate, reaching to middle of 4th joint. In the female similar, but 4th 5th and 6th joints are less expanded, the epipod very large, irregular rectangular, reaching to middle of 5th joint, basal joint has a laminar expansion pointing posteriorly and helping perhaps to produce a current of water in the brood chamber. It is present also in the young φ , but not so strongly developed.

First peraeopod (gnathopod) similar in both sexes, 2nd joint longest, curved, 3rd and 4th joints short with few setae, 5th joint as long as 3rd and 4th together, 6th joint not so long, 7th joint short, blunt, as long as width of 6th, 5th 6th and 7th joints with thick fringe of long setae, some doubly serrate, others simple. Unguis longer than 7th joint.

Second, third and fourth peraeopods, 3rd joint shortest, 4th and 5th joints subequal, 6th longest, no trace of a 7th joint, all joints, especially 4th 5th and 6th, with long simple setae on inner margin.

Fifth, sixth and seventh peraeopods, 2nd joint longest, 4th and 5th joints subequal, 6th joint equal to 3rd, 7th joint half as long as 6th with strong apical tooth, unguis as long as width of 7th joint.

Marsupial plates developed on 1st 2nd 3rd and 4th peraeopods, 1st pair distinct in young φ as well as in ovigerous φ , lanceolate, 2nd and 3rd pairs shorter and broader, 4th pair large, posterior margin with short inset lobe, 2 or 3 setiferous tubercles below hinge-line. The young φ has shorter marsupial plates, the 4th pair being

very shallow and not expanded. In the specimen from False Bay the tubercles are absent.

The male appendage on 3rd peraeon segment in both young and adult takes the form of a low button-like protuberance, posteriorly bilobed.

The male stylet on 7th peraeon segment only slightly tapering, with blunt apex.

First pleopod, peduncle with obliquely transverse row of 5 plumose spine-setae near base, rami a little longer than peduncle, broadest distally, outer ramus with 3 strong plumose setae near base, both margins and apex with long plumose setae, outer margin (next outer ramus) of inner ramus without setae. In ♀ only the apices are setose.

Second pleopod ♂, peduncle stouter than in first pleopod, with transverse row of ca. 5 spines at about the middle, rami longer than peduncle, penial filament longer than ramus, very narrow and deeply bifurcate at apex. (This seems to be more correct than describing it as ending in 2 long setae.)

Third-fifth pleopods ovate-lanceolate.

Uropods, elongate lanceolate, proximal end rounded, distal end tapering, distal part of hinge margin fringed with plumose setae, exposed ramus triangular, longer than broad, minutely setulose all round, without spine, concealed ramus two-thirds length of exposed ramus, and rather over one-third its width, with 2 long apical setae.

Length ♂ : 12 mm.; ♀ : 10 mm. Second antennae ♂ : 8 mm.; ♀ : 6 mm.

Length of ♀ from False Bay : 8 mm.

Colour : In spirit, yellowish white.

Locality : 10 miles N. of Robben Island, Table Bay. 28 fathoms. ♂ ♂ and ♀ ♀ (with ova and embryos). 28/10/97. False Bay (Seal Island, SW. $\frac{1}{2}$ S. distant $\frac{3}{4}$ mile). 11 fathoms. 1 ♀ with embryos. 12/11/02. s.s. "Pieter Faure." (S.A.M. Nos. A54 and A53.)

This species is very near *Arcturus corniger*, Stebbing. This latter, however, has 6 tubercles (2 median, 1 anterior pair and 1 posterior pair) instead of 5 on the 4th peraeon segment; the body is not setose; and the marsupial plate on the 4th segment has a row of tubercles (6 in the figure) below the hinge-line.

I have placed this species in the genus *Arcturopsis* on account of its general shape and the presence of an appendage on the 3rd peraeon segment in the ♂. This last feature Koehler says is

absolutely characteristic of his genus. He is also equally positive that the 4 species which he assigns to it have only 3 pairs of marsupial plates in the ♀. But the present species has 4 pairs distinct both in the ovigerous and the young females.

It would seem that this character by itself is not enough to delimit the genera of *Astacillidae*; for in *Astacilla* it is stated that there is only 1 pair, attached to the 4th segment (Stobbing, 1893, Sars, 1897, Richardson, 1905), while in 1910 Richardson corrects her previous statement and says there are 2 pairs in *A. granulata*, *caeca* and *dilatata*; and in 1911 Koehler maintains that *A. granulata*, *longicornis*, *deshayesii* and his own *mediterranea* have 3 pairs.

ARCTUROPSIS HIRsutus, var. SUBGLABER.

Very similar to the female of *A. hirsutus*, differing only in the following points.

Body less setose. Head with only two tubercles. Peraeon segments 1-3 and 5-7 without medio-dorsal tubercles, the side-plates only being tubercular. Fourth segment with an anterior pair of bosses and a posterior pair of tubercles, lateral tubercles not very prominent, postero-lateral margin not much expanded, not denticulate.

There are four pairs of marsupial plates, of which the fourth has a row of 4 inconspicuous tubercles below the hinge-line.

Uropods, concealed ramus bears 3 long apical spines and 1 short one.

The second antennae are incomplete.

Length: 17 mm.

Colour: In spirit, whitish.

Locality: St. Helena Bay (Paternoster Point SE. $\frac{3}{4}$ S. distant 9 miles). 80 fathoms. 1 ♀ with ova. s.s. "Pieter Faure." 7/3/02. (S.A.M. No. A52.)

I am unwilling to make this a new species in the absence of more material, though the distinguishing characters seem to have more than varietal value. The smaller size and thicker coating of setae of *A. hirsutus* may possibly be due to the warmer water of Table Bay. As noted above, the specimen of *A. hirsutus* from False Bay (*i.e.* from the warm Agulhas current) is smaller and more strongly setose than those specimens from Table Bay. These three forms therefore constitute a series, with a rather wide gap between the Table Bay form and the St. Helena Bay form.

GEN. ANTARCTURUS, zur Strassen.

ANTARCTURUS KLADOPHOROS, Stebbing.

(Plate XVIII. B.)

1908. *Antarcturus kladophoros*, Stebbing, S.A. Crust. pt. 4, p. 53, pl. 32 (where also a discussion of the genus will be found).

Stebbing's description was based on a single female. The following is a description of the male.

Body narrow and cylindrical, without setae.

Head, anterior margin with semicircular excavation, antero-lateral angles blunt, shorter than diameter of the large and prominent eye, inferior margin straight, without checks but with 2 small teeth, 2 low blunt tubercles between the eyes and behind these 2 long spines, knobbed at ends and standing on broad boss-like bases. Peraeon segments 1-3 not quite as long as head, subequal, covered with scattered granules, 1st not produced downwards and forwards. Fourth segment as long as head and first 3 peraeon segments together, granular dorsally and ventrally, the largest of the granules tooth-like and pointing backwards, 2 large teeth on posterior margin curving backwards, postero-lateral angles produced into rounded lobes. Sixth and seventh segments rather shorter than fifth, all three granulate.

Side-plates distinct, 5th 6th and 7th triangular, 2nd and 3rd small and not prominent, 1st and 4th forming downwardly produced rounded lobes.

First antenna, 1st joint without spine, flagellum longer than peduncle, with apical setae and 20 marginal filaments in pairs.

Second antenna, 1st joint with 1 blunt tubercle, 2nd joint with 3 on upper surface, 3rd joint with 3 on upper surface and 6-7 on lower surface, 4th joint shorter than 5th, both long and slender with a few setules, flagellum two-thirds fifth joint, 6-jointed, last joint with small apical tooth.

Upper and lower lips as in ♀.

Mandibles as in ♀, spine-row with 3 spines, molar strongly denticulate. First maxilla, outer plate with 11 spines, inner with 3 (2 long and 1 short) plumose setae.

Second maxilla, outer plate with 5 plumose setae, middle one with 3, inner plate with numerous plumose setae.

Maxillipeds as in ♀, inner plate squarely truncate, with plumose setae but no coupling-hook, epipod obovate reaching to end of 2nd joint.

First peraeopod (gnathopod), 5th 6th 7th joints with long doubly serrate setae, distal third of 7th joint suddenly narrowed, unguis one-third length of 7th joint, otherwise as in ♀.

Peraeopods 2, 3, 4 becoming successively longer. In second peraeopod 2nd joint equals 4th, 3rd joint twice length of 5th, all with blunt spines, 6th joint not quite as long as 5th, 7th joint one-quarter length of 6th, tipped with exceedingly long unguis and a much shorter spine, finger and unguis together equal to 6th joint.

Third peraeopod, 2nd joint longer than 2nd joint of peraeopod 2, 3rd and 4th joints subequal, both shorter than 2nd, 5th joint equals 2nd and 3rd together, 6th joint a little shorter, 7th joint and unguis as in peraeopod 2.

Fourth peraeopod, 2nd joint longer than 3rd and 4th together and equal to 5th, 6th joint shorter than 6th in 2nd and 3rd peraeopods, unguis also shorter.

Peraeopods 5, 6, 7 decreasing in length and stoutness, as in ♀, but armature is not so strong, especially on 3rd joint, on which joint in peraeopods 6 and 7 it is obsolete.

Male stylet on 7th peraeon segment lanceolate, sides straight, apex blunt, slightly incurved. There is no appendage on the third or fifth segments.

First pleopod, inner margin peduncle has ca. 12 hooked spines, otherwise as in ♀, except that distal end of exopod is produced outwards, and apex is shallowly trifid.

Second pleopod, peduncle short, rami long obovate, penial filament narrow, strongly curved at base, distally tapering to a single long point reaching to end of the plumose setae on apices of the rami.

Third-fifth pleopods, rami elongate lanceolate.

Cropods as in ♀, but the denticles on the surface are blunter and more granular.

Length: 18 mm.; *breadth*: 1.75 mm.; *depth*: 1.5 mm. Second antenna: 20 mm.

Colour: In spirit, pinkish.

Locality: Cape St. Francis NE, distant 29 miles. 75 fathoms. 2 ♂♂. s.s. "Pieter Faure." 19/2/02. (S.A.M. No. A51.)

NEOARCTURUS, n. g.

Body cylindrical, without band between 4th and 5th peraeon segments.

Fourth peraeon segment not longer than the third.

Side-plates distinct on all segments (except first?).

Pleon of 4 fused segments.

Second antennae with 3-jointed flagellum.

NEOARCTURUS OUDOPS, n. sp.

(Plates XVIII, C and XIX, B.)

Body granular, without bend between 4th and 5th pereon segments; head longer than broad, anterior margin excavate, antero-lateral angles blunt, no cheeks, a transverse groove dividing two low rounded and granular dorsal ridges, no eyes.

Pereon, all the segments about equal in length, the anterior ones being a little longer than the posterior ones, antero-lateral angles of the 1st segment not much produced, the first four segments with two transverse angular dorsal ridges, the anterior of which is smaller than the posterior, the three last segments with one large transverse ridge.

Side-plates distinct on all the segments (including the first?). Pleon of four fused segments, the dividing grooves being distinct, first segment small and short, second large and swollen, the fourth (telson) with lateral subapical wings.

First antenna, 1st joint stout, 3rd joint short and geniculate, flagellum a little longer than 2nd joint, with 6 pairs of sensory filaments and 2 apical setae.

Second antenna, 1st and 2nd joints short, 3rd 4th and 5th becoming gradually more slender, 4th a little longer than 3rd and 5th a little longer than 4th, flagellum as long as 5th joint, 3-jointed, the 2nd joint being the longest.

Upper lip shallow, semicircular, very minutely hirsute.

Lower lip, lobes broad, inner angles excised.

Mandibles, the left strongly angular, cutting-edge tridentate, secondary cutting-edge bidentate, spine-row with 3 spines, molar prominent, quadrate; the right straight, both cutting-edges entire and rather feeble, spine-row with one feeble spine, molar strong, oblique, with setae on posterior surface.

First maxilla, outer plate with 9-10 spines, inner plate with 2 spines and some setules.

Second maxilla, outer and middle plates with 3 spines, inner with numerous spines.

Maxillipeds, 1st joint strong, 3rd joint short, 7th joint short and blunt, 5th 6th and 7th joints with pectinate setae, inner plate with rather sharp inner angle, setose but without coupling-hooks, epipod

lanceolate, reaching to middle of 4th joint, margins smooth. First peracopod (gnathopod), 3rd 4th and 5th joints short, 6th joint ovate-fusiform, posterior margins of 5th and 6th joints with pectinate setae, 7th joint two-thirds length of 6th, setose, biunguiculate.

Second, third and fourth peracopods similar to one another except that the 2nd joint is barely longer than 3rd in peracopod 2, longer in peracopod 3 and twice as long in peracopod 4, 3rd and 4th joints short in all three peracopods, 5th and 6th joints subequal, 7th joint three-quarters as long as 6th, bearing in peracopods 2 and 3 1 very long and 1 shorter unguis, the longer one nearly twice length of 7th joint, and in peracopod 4 2 short unguis, the longer of which is not half the length of 7th joint, inner margins of 2nd-6th joints with long setae.

Fifth, sixth and seventh peracopods similar to one another except that 2nd joint is long and narrow in peracopod 5, shorter and somewhat ovate in peracopod 6 and still shorter, strongly ovate and equal to the 3rd joint in peracopod 7, 4th and 5th joints short, 6th joint with 4 curved spines on hind margin, each spine bearing a little tuft of setules on its outer edge, 3rd and 6th joints subequal, 7th joint shorter than 6th, setose, biunguiculate.

Male stylet on seventh peracopod segment, margins sinuous, apex deeply bifid, the lobes blunt.

No appendage on the 3rd or 5th peracopod segment.

First pleopod, peduncle with ca. 10 teeth on outer margin and 3 hooked spines on inner margin, endopod a little longer than peduncle, with plumose setae, exopod nearly twice length of peduncle, outer margin bearing 5 simple setae followed by 6 plumose setae, after which is a deep incision, the apex is bifid, the outer and longer lobe spoon-shaped, with strong teeth on inner margin and apically hirsute, inner lobe with plumose setae, a setose ridge runs nearly whole length of exopod, ending on the inner margin of the outer lobe.

Second pleopod, peduncle short and broad, outer margin with 2 plumose setae, inner with 3 hooked spines, rami equal, with plumose setae, penial filament rather longer than rami, broadened and bilobed distally, the inner lobe longer and narrower than the outer. Third, fourth and fifth pleopods lanceolate, the endopods of the third and fourth pairs shorter than the exopods.

Uropods elongate lanceolate, proximally rounded, minutely setulose on both margins, outer margin distally with long plumose setae and a short stout spine at the junction with the exposed lobe,

which is triangular and has a minute setule on either side of the terminal spine, concealed lobe very small ending in one long seta.

Length : 5 mm.

Colour : In spirit, whitish.

Locality : Cape Point NE. by E. $\frac{1}{4}$ E., distant $38\frac{1}{2}$ miles. 755 fathoms. 1 ♂. s.s. "Pieter Faure." 23/6/05. (S.A.M. No. A69.)

This form seems to require the institution of a new genus, though the absence of the female is greatly to be regretted.

The composition of the pleon separates *Neoarcturus* from all the other genera except *Arcturoopsis*, *Arcturella* and *Arcturina*; from these it differs in the fourth peraeon segment not being longer than the third, thus resembling *Arcturus*. The latter, however, has more than four joints in the flagellum of the second antennae, whereas this species has only three. *Arcturina* is distinguished by the aberrant structure of the 2nd, 3rd and 4th peraeopods and *Arcturoopsis* by the presence of an appendage on the 3rd (or 5th) peraeon segment in the male.

Lastly, it approaches *Antarcturus* in the absence of coupling-hooks on the maxillipeds and the peculiar first pleopods in the male. The shape of the apex of the exopod of the latter in *N. oudops* can be regarded as an exaggerated and ornate development of that found in *A. kladochoros*.

GEN. PLEUROPRION, zur Strassen.

1902. *Antares*, zur Strassen, Zool. Anz. xxv. p. 687 (nom. procec.).
 1903. *Pleuroprion*, id. ibid. xxvi. p. 31.
 1905. „ Richardson, Bull. U.S. Nat. Mus. No. 54, p. 342.
 1908. „ Stebbing, S. Afr. Crust. pt. 4, pp. 51, 52.

PLEUROPRION CHUNI, zur Strassen.

1902. *Antares chuni*, zur Strassen, Zool. Anz. xxv. p. 687, text-fig. 4.
 1903. *Pleuroprion chuni*, id. ibid. xxvi. p. 31.

One ♂ and one ♀ from the Agulhas Bank, 156 metres ("Valdivia") (omitted from the General Catalogue, 1910).

FAMILY STENETRIIDAE.

1905. *Stenetriidac*, Hansen, Proc. Zool. Soc. Lond. 1904, ii. 2.
 p. 315.
 1905. „ Richardson, Bull. U.S. Nat. Mus. No. 54, p. 439.

GEN. STENETRIUM, Haswell.

1881. *Stenetrium*, Haswell, Proc. Linn. Soc. N.S.W. vol. 5, p. 478.
1886. " Beddard, Challenger Rep. vol. 17, p. 8.
1905. " Hansen, l.c. pp. 303, 316. (Conspectus specierum.)
1905. " Stebbing, in Herdman's Ceylon Pearl Fish. Suppl.
 Rep. xxiii. pp. 48, 53 (where previous references
 are given).
1906. " Nobili, Bull. Mus. Paris, 12, p. 266.
1910. " Richardson, Proc. Biol. Soc. Washington, 23,
 p. 110.

STENETRIUM CRASSIMANUS, n. sp.

(Plate XX. A.)

Whole body, in ♂ more so than ♀, covered with rather long hairs, which are especially numerous on the pleon.

Antero-lateral angles of the head slightly bent inwards, teeth forming the inner angles of the sockets for the second antennae fairly prominent, rostrum longer than broad with blunt apex. Eyes kidney-shaped. First segment of the peraeon rather longer than the rest, its antero-lateral angles strongly produced.

Lateral margin of pleon with one tooth.

First antenna, 1st joint largest, 2nd joint shorter than 3rd, much shorter than 1st, flagellum not quite as long as peduncle, composed of ca. 12 joints very indistinctly separated.

Second antenna, 1st joint acutely produced externally, apex with 1 tooth and 4 setae, 3rd joint rather longer than 1st and 2nd combined, exopod widening distally, 4th joint the shortest, 6th joint a little shorter than 5th, flagellum a little longer than peduncle, with many short scarcely separated joints.

Upper lip apically rounded; epistome with distal margin bidentate in the centre.

Lower lip, lobes with inner margin straight, outer strongly sinuous, apices setose.

Mandibles, cutting-edge 4-toothed, secondary cutting-edge in left mandible 3-toothed, in the right probably represented by 4 serrate spines, spine-row in left mandible with 6 serrate spines and one arising from base of secondary cutting-plate, in the right with 5 serrate spines; molar strong and prominent, with tufts of setae on posterior margin; palp strong, 2nd joint with 2 long serrate

spines and several shorter ones, 3rd joint falciform, with short marginal spines and longer serrate apical ones.

First maxilla, inner lobe with 3 strong spines, 1 weaker one between the bases of the two inner spines, a small tooth and some fine setules, outer lobe with 11 more or less serrate spines.

Second maxilla, outer and middle lobes with 4 spines, inner plate broader, with several serrate spines on inner margin.

Maxillipeds, epipod reaches to apex of 4th joint, apex of inner plate with blunt teeth and serrate spines, three very short and broad coupling-hooks.

First paraeopod (gnathopod) male, 3rd joint strongly and acutely produced on upper margin, 4th joint subacutely produced, 5th joint not produced on lower margin, 6th joint as broad as long, thick and convex above, with a thin laminar process below forming the palm and hind margin, front margin convex, setose, hind margin densely setose, about as long as the palm, which is transverse, setose, and has 2 strong teeth in the centre and a third tooth at its junction with the hind margin, finger curved, longer than palm, finely setulose.

First paraeopod (gnathopod) female, much smaller than in ♂, 3rd joint strongly and acutely produced on front margin, 4th joint likewise produced in front and also less strongly on hind margin, 5th joint larger proportionately and squarer than in ♂, 6th joint half as long again as broad, margin nearly parallel, front margin with a few isolated setae, hinder densely setose, palm shorter than hind margin, transverse, defined by a strong spine and bearing a row of pectinate spines decreasing in length towards the hinge of the finger, where there is a bunch of longer setae, finger stout, only a little longer than palm, with spinulose inner margin.

Second paraeopod (gnathopod) slender, 2nd joint as long as or a little longer than 3rd and 4th combined, 3rd joint a little longer than 4th, with 1 spine in centre of front margin, 4th joint produced in front, with 1 apical spine, 6th joint a little shorter than 2nd, 5th joint a little shorter than 6th, 7th joint one-third length of 6th, bianguiculate.

Third-seventh paraeopods do not differ from the second paraeopods.

First pleopod, male, peduncle with 2 submedian spines, each ramus with a long seta in the centre and a row of marginal setae.

First pleopod, female, tapering distally with bifid apex.

Second pleopod, male, as figured by Hansen but apex of penial filament is acutely pointed.

Third pleopod as figured by Hansen.

Fourth pleopod. Hansen in his description of the genus *Stenotrium*, loc. cit. p. 305, says: ". . . a two-jointed exopod, which is slightly longer and somewhat broader than the unjointed endopod. . . ." This conflicts somewhat with his figure, pl. xx. fig. 2k. Stebbing describes and figures the exopod of the fourth pleopod of *S. chiltoni* as narrower than the endopod, and this is also the case in the present species.

Fifth pleopod, short and broad, distal end obliquely truncate, apex setulose.

Uropod, peduncle shorter than rami, of which the inner is rather longer than the outer, apical setae long and slightly plumose, the others shorter and simple.

Length: 7 mm.; breadth: 2 mm. Second antennae: 5 mm.

Colour: Greyish white, peraeon with faint indications of a darker median line, most marked on the last three segments.

Locality: St. James, False Bay, under rocks, low tide. 29/4/12. (Coll. K.H.B.) One ♂, one ♀ with ova. (S.A.M. No. A2261.)

The distribution of the genus is cosmopolitan, species having been recorded from shallow water in New Zealand, Australia, Siam, Ceylon, the West Indies, and the "Challenger" obtained a deep-water form off the Rio de la Plata in S. America. With the possible exception of *S. mediterraneum*, Hansen, 1905, which Richardson, 1910, says is synonymous with *Jaera longicornis*, the genus seems absent from European waters.

FAMILY JAERIDAE.

1897. *Janiridae*, G. O. Sars, Crust. Norw. ii. p. 98.
 1905. *Parasollidae* (part), Hansen, Proc. Zool. Soc. Lond. 1904, ii. pt. 2, p. 315.
 1905. *Janiridae*. Stebbing, in Herdman's Ceylon Pearl Fish. Suppl. Rep. 23, p. 48.
 1905. „ Richardson, Bull. U.S. Nat. Mus. No. 54, p. 448.
 1910. *Jaeridae*, Stebbing, J. Linn. Soc. Lond. vol. 31, p. 224.

GEN. JANIRA, Leach.

1814. *Janira*, Leach, Edinb. Encycl. vii. p. 434.
 1829. *Oniscoda*, Latrielle, Cuv. Règne Anim. 2nd ed. iv. p. 141.
 1840. „ M. Edwards, Hist. Nat. Crust. iii. p. 151.
 1847. *Henopomus*, Krøyer, Naturh. Tidskr. (2) ii. p. 366.

1853. *Asellodes*, Stimpson, Mar. Invert. Grand Manan. p. 41.
 1886. *Janira*, Beddard, Challenger Rep. vol. 17, pt. 48, p. 5.
 1898. „ A. O. Walker, Tr. Biol. Soc. Liverpool. vol. 13, p. 280.
 1905. „ Stebbing, in Herdman's Ceylon Pearl Fish. Suppl.
 Rep. 23, p. 49.
 1910. „ Stebbing, J. Linn. Soc. Lond. vol. 31, p. 224.

JANIRA CAPENSIS, n. sp.

(Plate XX. B.)

Body nearly parallel-sided, greatest width in the middle, covered with small slender spines which are strongest on the lateral margins of the peraeon.

Head, anterior margin somewhat produced, straight in centre, slightly concave in front of the eyes, which are large, oval, black, near the lateral margin. Peraeon, antero-lateral angles of the segments produced as small spiniferous lobes, side-plates 1-4 bilobed, side-plates 5-7 extending beyond postero-lateral angles of the segments, notched.

Pleon nearly circular, lateral margins minutely denticulated, surface spiniferous, about 7 rather long slender spines on lateral margin and a row of close-set spines at the apex between the uropods.

First antenna reaches to apex of 5th peduncular joint of second antenna, basal joint of peduncle strongest, 3rd joint shorter than 2nd, 4th joint very small, flagellum $1\frac{1}{2}$ times length of peduncle, 17-jointed, setose and with sensory filaments.

Second antenna longer than body, exopod on 3rd joint well developed, with apical tuft of spines, 5th joint rather shorter than 6th, flagellum a little longer than peduncle, multiarticulate, rather feebly setose.

Upper lip a little broader than long, apex rounded, with short fine setules.

Lower lip, lobes broad and stout, outer margin very convex, inner apical angles setose.

Mandibles, cutting-edge with (4 or) 5 teeth, secondary cutting-edge in the left mandible similar, spine-row with 6 spines in the left, 8 in the right mandible, palp 1st joint shortest, 2nd joint longest, with a row of ca. 7 spines near apex, 3rd joint gently curved with marginal and apical spines.

First maxilla, outer plate with ca. 9 spines, most of them serrate on their inner margins, inner plate half as wide as outer, apex rounded, with 4 strong spine-setae and numerous setules.

Second maxilla, outer and middle plates with 3 long spines, inner plate nearly twice as wide, with numerous setae.

Maxillipeds, 2nd joint stout, width equals outer margin, 3rd joint twice as broad as long, 4th joint and proximal half of 5th broad, 5th joint narrowing rapidly distally, 6th joint not very slender, 7th joint shorter than 6th, inner plate with rounded-truncate spinose apex, inner margin with 2-3 short stout coupling-hooks, epipod reaching to the 4th joint, oblong, outer distal margin obliquely truncate, not setose.

First peracopod (gnathopod) ♂, 3rd joint two-thirds length of 2nd, 4th joint half length of 3rd and shortly produced in front, 5th joint equal to 2nd, hind margin slightly expanded, with one long stout apical spine and one shorter subapical one, 6th joint slender, equal to the 5th, setose on both margins, 7th joint very short, biunguiculate with small tooth at base of ungues.

Second and following peraeopods similar to first but stouter and rather shorter, expansion on 5th joint not so marked, apical and subapical spines small, inner margin of 6th joint with solitary spines, outer margin setose, triunguiculate.

First pleopods ♂, peduncles fused basally, diverging distally, with well-developed rami.

Second pleopod ♂, peduncle longer than broad, narrowing distally, exopod arising at apex of peduncle, distal portion of penial filament a little longer than peduncle.

Third pleopod, outer ramus stout, longer than and nearly as broad as inner, 2-jointed, inner ramus with 3 apical plumose setae.

Fourth pleopod, widest portion of outer ramus only half the width of inner, 2nd joint tapering, with apical setae.

Uropods, both rami longer than peduncle, outer shorter than inner, both margins undulate and with groups of spines, apices also with spines.

Length : 4 mm. ; *breadth* : 2 mm. Second antennae : 6 mm.

Colour : Whitish, with minute stellate specks of dark pigment.

Locality : Sea Point, Cape Town. 25/4/98. (Dr. W. F. Purcell.) 1 ♂. St. James, False Bay. 11/8/12. (Coll. K.H.B.) 5 ♂♂. Under stones at low tide. (S.A.M. No. A2363.)

GEN. IANIROPSIS, G. O. Sars.

1897. *Ianiropsis*, G. O. Sars, Crust. Norw. ii. p. 102.

1904. *Janiropsis*, Richardson, Harriman Alaska Exp. Crust. 10, p. 221.

1904. *Janiropsis*, Richardson, Proc. U.S. Nat. Mus. 27, p. 665.

1910. " Thielemann, Abh. Ak. Wiss. München. Suppl. 2,
Abh. 3, p. 70.

JANIROPSIS PALPALIS, n. sp.

(Plate XXI. A.)

Body nearly parallel-sided; surface smooth, only a few short setae on the lateral margins.

Head, anterior margin not very produced, front slightly concave, antero-lateral angles obsolete, eyes small, oblong, dark, some little distance from the lateral margin.

Pereon, antero-lateral angles not much produced, side-plates bilobed.

Pleon rather longer than broad, tapering very gently, apex flatly rounded, with a row of setae, postero-lateral angles not prominent, with a row of setae, margins entire.

First antenna reaches to middle of 5th peduncular joint of second antenna, basal joint strongest, 3rd joint a little longer but more slender than 2nd, 4th joint very small, flagellum 10-jointed in ♂, 7-jointed in ♀, with only a few sensory filaments.

Second antenna longer than body, exopod on 3rd joint well developed, setiferous, 5th joint a little shorter than 6th, flagellum about as long as peduncle, multiarticulate, feebly setose.

Upper lip as broad as long, with fine apical setae.

Lower lip, lobes broad, inner and outer margins equally convex, so that inner angle becomes an apical angle, beset with setae.

Mandibles, cutting-edge with 5 teeth, secondary cutting-edge in left mandible with 5 teeth, spine-row with 6 spines and a blunt tooth below them, molar prominent, denticulate, 2nd joint of palp slightly the longest, with 2 long stout setae, 3rd joint curved, with apical and marginal setae.

First maxilla, outer plate with ca. 10 serrate spines, inner plate with 4 spines and several setules.

Second maxilla, outer and middle plates with 3 spines, inner plate not quite twice as broad, with several spines and setules.

Maxillipeds ♂, width of 2nd joint equal to inner margin, 4th joint very broad, expanded on both margins, 5th joint as long as 1, 2, 3 combined, 6th joint slender and a little shorter than 5th, 7th joint still more slender and a little shorter than 6th, inner plate rounded-truncate, with apical spines and 2 stout coupling-hooks near its base,

epipod small, reaching apex of 3rd joint, outer margin strongly angular.

Maxillipeds ♀, 4th joint not so much expanded as in ♂, as long as broad, 5th joint half as long as 4th, 6th joint a little shorter than 4th, 7th joint equal to 5th, epipod scarcely reaching apex of 3rd joint.

First peracopod (gnathopod) similar in both sexes, 2nd joint longest, 5th joint equal to 3rd, fusiform, not expanded, outer margin with a few setae, inner margin with shorter and more numerous setae, 6th joint not quite as long as 5th, 7th joint minute, biunguiculate.

Second and following peracopods stouter and rather shorter, 2nd and 3rd joints both shorter than 5th, 7th joint triunguiculate.

Marsupial plates on segments 2, 3, 4.

First pleopod ♂, distally expanded, without rami.

First pleopod ♀ (operculum) broader than long, rounded; distal margin concave.

Second pleopod ♂, peduncle apically pointed, exopod arising some distance from apex, penial filament not projecting much beyond apex of peduncle.

Third pleopod, outer ramus apically blunt, with 3 strong plumose setae, one on outer angle, two on inner, inner ramus almost straight, suture between its 2 joints oblique, 2nd joint not projecting much beyond apex of outer ramus.

Fourth pleopod, inner ramus 1-jointed, half as long as outer ramus, narrow and tapering to an acute point, outer margin (away from outer ramus) setulose.

Uropods two-thirds length of pleon, peduncle nearly one-third length of pleon, rami longer than peduncle, inner ramus longer than outer, with apical and marginal groups of setae.

Length: 4 mm.; *breadth*: 1 mm. Second antennae: 6 mm.

Colour: In spirit, whitish, with dark pigment specks, circular (more or less) in the adult, stellate in younger specimens.

Locality: Sea Point, Cape Town. 19/5/96. (R. M. Lightfoot.) Several ♂♂ and 2 ♀♀ (one with ova). (S.A.M. No. A252.)

Kalk Bay, False Bay. 26/5/96. (R. M. Lightfoot.) Several ♂♂ and young. (S.A.M. No. A251.)

This species closely resembles *I. longiantennata*, Thielemann. The second antennae, however, are even longer proportionately than in that species, the shape of the head is different, the maxillipeds in the ♂ differ in the 4, 5, 6, 7 joints, and the epipod in both sexes does not extend beyond the apex of 3rd joint.

The genus contains only 4 other species, viz.: *I. brevirostris*, G. O. Sars, 1897, from Norway, *I. californica*, Richardson, 1904, from California, *I. kincaidii*, Richardson 1904, from Alaska, and *I. longiantennata*, Thielemann 1910, from Japan.

GEN. JAEROPSIS, Koehler.

1885. *Jaeropsis*, Koehler, Ann. Sci. Nat. ser. 6, vol. 19, art. 1, p. 2.
 1886. „ Beddard, Challenger Rep. vol. 17, p. 20.
 1893. „ Stebbing, Hist. Crust. p. 379.
 1905. „ id. in Herdman's Ceylon Pearl Fish. Suppl. Rep. 23,
 p. 50.
 1909. „ Richardson, Proc. U.S. Nat. Mus. vol. 36, p. 421.

JAEROPSIS CURVICORNIS, (Nicolet).

(Plate XX. C.)

1849. *Jaera curvicornis*, Nicolet, in Gay's Hist. de Chile. Zool. vol. 3
 p. 263, pl. 3, fig. 10.
 1891. *Jaeropsis neo-zelanica*, Chilton, Tr. N.Z. Inst. vol. 24, p. 267.
 1902. „ *curvicornis*, Richardson, Tr. Conn. Acad. Sci. vol. ii.
 p. 298.
 1905. „ „ Stebbing, l.c. p. 51, pl. xi. (C).

The single specimen differs only in details from the descriptions of Chilton and Stebbing; both the latter, like Nicolet's, were based on females, whereas this specimen is a male.

The head is broader than long, the antero-lateral angles not so produced as in Stebbing's figure; the eyes are dark.

Second antenna, 5th joint not denticulate on inner (front) margin as in Stebbing's figure.

Mandibles, the spine-row has 10 spines.

The apex of the pleon between bases of the uropods is convex; in Stebbing's figure it is emarginate. The lateral margins have 3 teeth on one side, 4 on the other.

First pleopods very little expanded distally, with rami.

Second pleopods, peduncle lanceolate, exopod arising some distance from apex, male stylet hardly projecting beyond its apex.

Third pleopods, inner ramus with 3 apical strong plumose setae, outer ramus very little longer than inner, 2-jointed, 2nd joint apically pointed.

Fourth pleopods, outer ramus minute.

The uropods have a tooth at the apex of the peduncle.

Length : 3.5 mm. ; breadth : 0.75 mm.

Colour : Whitish.

Locality : St. James, False Bay. 29/4/12. (Coll. K.H.B.) 1 ♂.
(S.A.M. No. A2262).

Distribution : Chile, New Zealand, and Ceylon.

FAMILY MUNNOPSIDAE.

1861. *Munnopsidae*, M. Sars, Chr. Vid. Selsk. Forh. 1860, p. 84.
1893. " Stebbing, Hist. Crust. p. 383.
1897. " G. O. Sars, Crust. Norw. vol. 2, p. 132.
1905. " Richardson, Bull. U.S. Nat. Mus. No. 54, p. 485.
1905. *Parasellidae* (part), Hansen, Proc. Zool. Soc. Lond. 1904, ii. 2,
p. 315.
1912. *Munnopsidae*, Richardson, Bull. Inst. océan. Monaco. No. 227,
p. 1.

GEN. : MUNNOPSURUS, Richardson.

1912. *Munnopsurus*, Richardson, l.c. p. 1.

MUNNOPSURUS MIMUS, n. sp.

(Plate XXI. B.)

Body smooth, head broader than long, widest in front, more strongly calcified than any other part, anterior margin excavate.

Peraeon, first segment as wide as head, lateral portions produced forwards, scabrous, second, third and fourth segments wider than head, third and fourth rather wider than second, antero-lateral angles scabrous and bearing 1 small spine each, fifth, sixth and seventh segments separated from anterior segments by a marked gap and not separated from one another as are the latter, with shallow median groove but no tubercles, lateral portions quadrate.

Side-plates 1-4 bilobed, scabrous, 5-7 entire, not so angular as in *M. arcticus*, scabrous but less so than the 4 anterior ones.

Pleon as long as broad, evenly rounded without median lobe.

First antenna, 1st joint very stout, 2nd joint acutely produced internally, with 1 strong and 2 smaller spines, 3rd joint equal to 2nd with one small spine on outer apical angle, 4th joint one-quarter as long, flagellum in ♂ 4 times, in ♀ 1½ times as long as peduncle, with long setae on lower edge.

Second antenna, 1st joint small and developed chiefly on outside,

2nd joint broader than long, 3rd joint with acute projection on upper side covering the junction of the 4th joint, which consequently appears to be sunk in the 3rd, outer margin of 3rd joint with small but distinct and movable scale bearing 2-3 apical spines, inner margin slightly convex with 1 strong outstanding spine, 4th joint also hollowed out beneath to receive the 5th joint, 5th and 6th joints and the flagellum not preserved intact on any of the specimens, 5th joint measures 17 mm., the 6th joint 14 mm., and the flagellum 30 mm., 6th joint about as slender as peraeopods 2-4, 5th joint a little stouter.

Upper lip as broad as long, proximal portion triangular and forming a low blunt tubercle, distal margin evenly and rather flatly rounded, minutely hirsute. Epistome strongly calcified, semicircular, embracing the proximal half of labrum.

Lower lip, outer lobes broad, apices bluntly rounded, inner margin densely fringed, inner lobes well developed.

Mandibles, cutting-edge bilobed in left, entire in right, molar stronger than in *M. arcticus*, with small brush of setae.

First maxilla, outer lobe with 12 spines, some of them minutely serrate on outer margins, inner lobe with incurved apex bearing 2 long spine-setae and numerous fine setules.

Second maxilla, outer and middle lobes similar, bearing long curved spine-setae, serrate on inner margins, inner lobe twice as broad with 16-18 rather shorter doubly-serrate spine-setae.

Maxillipeds, 4th joint largest, 5th joint with outer margins short, inner margin expanded but not sharply produced, 6th joint strongly expanded internally, 7th joint slender and a little shorter than 6th, inner plate squarely truncate, with apical plumose setae and 8 coupling-hooks near the base, epipod reaching half-way along 4th joint, lanceolate, apically pointed, inner margin nearly straight, outer convex and distally oblique.

First peraeopods a little longer than body, 5th joint the longest, 6th joint two-thirds length of 5th, 7th joint about one-seventh length of 6th.

Second, third and fourth peraeopods very long, about $2\frac{1}{2}$ times length of body, 6th joint twice length of 5th, 7th joint one-quarter length of 6th, biunguiculate.

Marsupial plates developed on peraeopods 1-4, not meeting in the middle line, except in the ovigerous ♀, where the 2nd 3rd and 4th pairs are greatly enlarged.

Fifth, sixth and seventh peraeopods, 5th joint strongly expanded posteriorly, narrowing rapidly distally, 6th joint symmetrically ovate,

less strongly expanded, both 5th and 6th joints with plumose setae on both margins, 3rd joint with a few plumose setae on posterior margin, 7th joint as long as width of 6th, very slender, margin minutely setulose, apex with 2-3 setae.

Male appendages on 7th segment narrow, slender, distal three-quarters thread-like, not extending beyond the first pleopods.

First pleopods ♂, long and narrow, not apically expanded, rami projecting a little beyond the apices of peduncles.

Operculum ♀ evenly rounded and without (or with very indistinct) keel.

Second pleopods ♂, strongly contracted near the apex, male stylet barely longer than peduncle.

Third pleopods, outer lobe 2-jointed, narrow, strongly curved but hardly reaching beyond apex of broad inner lobe.

Fourth pleopod consists of 2 broad rather wrinkled lamellae, the anterior one being smaller and fitting within the posterior one, which fits within the still larger and similarly wrinkled fifth pleopod, which consists of only a single lamella.

Uropods small, peduncle barely projecting beyond margin of pleon, inner ramus as long as peduncle, with 2 apical spines, outer ramus a little longer, with 3 apical spines and a few setae.

Length: ♂ 11 mm. ♀ 14 mm.; breadth: ♂ 4 mm. ♀ 5 mm.

Colour: In spirit, whitish or faintly pinkish.

Locality: Lion's Head SE. $\frac{1}{4}$ S. distant 50 miles, 230 fathoms; 24 ♀♀ (some with ova) and 1 ♂♂. 2/1/02. Cape Point NE. distant 40 miles, 560-700 fathoms; 1 mutilated specimen. 17/9/03, s.s. "Pieter Faure." (S.A.M. Nos. A1614 and A2458.)

This species is very near to the type species *M. arcticus*, Richardson, but differs in the following characters:—

There are no dorsal tubercles on pereaeon segments 5-7 and the pleon is evenly rounded, not produced into a median lobe.

The mandibles have more strongly developed molars and the left cutting-edge is bilobed.

Inner lobe of the first maxilla has 2, not 3, spines; and the spines on outer and middle lobes of the second maxilla are long and pointed, not short and blunt.

The sixth joint of the maxilliped is strongly expanded, not parallel-sided as represented in Richardson's figure.

The second pleopod in the male is distally narrowed, the outer margin not being evenly convex.

The uropods have apical spines instead of being rounded. *M. arcticus* is recorded from Nova Zembla.

FAMILY DAJIDAE.

1887. *Dajidae*, Giard and Bonnier, Travaux de l'Inst. Zool. Lille, vol. 5.
 1893. „ Stebbing, Hist. Crust. p. 398.
 1895. *Dajinae*, Hansen, Isopoden d. Plankton Exp. p. 22.
 1897 (-1899). *Dajidae*, G. O. Sars Crust. Norw. ii, p. 221.
 1905. *Dajidae*, Richardson, Bull. U.S. Nat. Mus. No. 54, p. 572.

GEN. ZONOPHRYXUS, Richardson.

1903. *Zonophryxus*, Richardson, Bull. U.S. Fish. Comm. p. 51.
 1904. „ id. Proc. U.S. Nat. Mus. vol. 27, p. 677.
 1910. „ id. Washington Bur. Fish. Doc. 736, p. 41.
 1911. „ Koehler, Bull. Inst. océan. Monaco, No. 196, p. 16.

ZONOPHRYXUS QUINQUEDENS, n. sp.

(Plate XXII.)

Body of ♀ oval. The dorsal surface shows four thoracic segments marked by indistinct sutures and four abdominal segments of which the sutures are very clear and deep in the middle line but indistinct laterally. The thoracic segments are more marked ventro-laterally. The margin which surrounds the body ventrally has 4 small notches in the thoracic region and posteriorly is produced into 10 triangular teeth, 5 on each side without a median one.

The external antennae are apparently 1-jointed (not 2-jointed as in *Z. grimaldii*). The internal antennae are large and laminar, indistinctly divided into two portions, of which the posterior embraces the upper and lower lips (rostrum).

Upper lip broad, margin entire, very slightly emarginate on either side of a central convexity.

Lower lip narrower, tapering, with distal end deeply indented. Both lips are curved towards one another at the sides so as to form a cone. Through the opening at the apex of this cone project the narrow gouge-shaped mandibles.

Maxilla. In one specimen there were two appendages lying beneath the maxillipeds and about in the same position, the "palp" pointing outwards as does the epipod of the maxillipeds. Both the palp and the outer margin of the basal plate are minutely serrulate. In two other specimens I have failed to find any trace of these appendages. Koehler (l.c.) makes no mention of them, but says he

refrained from dissecting the single specimen at his disposal; and they cannot be seen until the maxillipeds have been removed.

Maxillipeds indistinctly 2-jointed, with well-developed epipod. All five pairs of peraeopods are similar, consisting of four stout joints and a curved unguis with 2 setae on its inner margin.

Marsupial plates, 1st pair elongate, composed of a short outer lobe and a longer inner lobe, almost completely covering the maxillipeds, 2nd and 3rd pairs very small, 4th pair larger but not equalling the 1st pair, 2nd-4th pairs completely hidden under 1st pair, 5th pair very large, extending to hinder end of body.

When the marsupial plates are folded back the ventral surface of the body shows a wrinkled (this is perhaps due to preservation) median ridge and four transverse ridges; the first transverse ridge is just below the opercular plate (sternite); at the sides of the third ridge is a pair of 2-jointed appendages, representing the single pair of plocopods. At the extreme end of the body are three raised pads, apparently representing the last three pleon segments. If so, the segment below the opercular plate is the seventh peraeon segment.

A single specimen of a young female shows a transverse head with which the 1st peraeon segment is fused, and 5 free peraeon segments. The 7th peraeon segment is fused with the abdomen, which is composed of a single segment. There are 7 papillae along the medio-ventral line. The rostral cone shows no differentiation into upper and lower lips, and there is no trace of the mandibles. There are 7 pairs of peracopods, each consisting of 5 joints and a curved unguis; they appear hammer-shaped owing to the 5th joint being very much larger than the small 3rd and 4th joints and being much expanded behind.

Between the 3rd and 4th (free) segments of the right side a cryptoniscan male was attached.

The male is similar in shape to that of *Z. retrodens*, Richardson (Proc. U.S.N.M. vol. 27, 1904, p. 679, fig. 33). On each of the 6 free peraeon segments there is a rounded median ventral papilla.

The oval pleon shows three indistinct furrows.

Mandibles minute, styliform, with broadened bases.

Peracopods 5-jointed, hammer-shaped, first 2 joints large, stout, 2nd and 3rd joints small, 5th joint large, transversely oval, with curved unguis.

The single specimen was found under the right 5th marsupial plate of a female measuring 8 mm. by 4.5 mm.

Cryptoniscus stage. The peraeon and pleon show the full complement of segments, the postero-lateral angles being acutely produced

backwards. First antenna has 2 large basal joints and 2 minute terminal lobes, both lobes and the posterior apical angle of 2nd basal joint with thick tufts of setae.

Second antenna, peduncle 4-jointed, basal joint large, flagellum 5-jointed.

Pereopods 1 and 2 stout, 3-jointed, 3rd joint with ill-developed unguis.

Pereopods 3-5 long, slender, 6-jointed, 2nd joint distally expanded on front margin, 3rd and 4th joints small, 5th joint almost as long as 1st, elongate oval, with short oblique palm defined by one spine and bearing 2 others in the middle, finger longer than palm but not half as long as 5th joint.

Pereopods 6 and 7 similar to pereopods 3-5 but 5th joint is slender and tapering, the finger as long as 5th joint, very slender and tapering, nearly straight.

Pleopods, peduncle short, broad, with 2 setae on inner apical angle, rami subequal, set rather far apart on peduncle, tipped with long plumose setae.

Uropods, peduncle very short, outer ramus minute, tipped with setae, inner ramus nearly as long as 6th pleon segment and not clearly distinguished from peduncle, tapering gradually, tipped with setae.

Length ♀ : 22 mm. ; ♂ : 2.5 mm. ; breadth ♀ : 14 mm. ; ♂ : 1 mm.

Length of young female with same form as adult and with attached male : 8 mm. ; of younger female with attached cryptoniscid male : 5 mm.

With the exception of *Holophryxus giardi*, Richardson (39 mm.), this is the largest member of the family.

Colour : In spirit, yellowish.

Locality : Cape Point NE. by E. distant 36 miles, 650-700 fathoms. 2 ♀ ♀, 1 ♀ juv. and 3 *Cryptoniscus* larvae. 8/7/03. Cape Point ENE., distant 36 miles, 660 fathoms. 1 ♀. 22/7/03. Cape Point NE. $\frac{1}{4}$ E., distant 29 miles, 470 fathoms. 1 ♀ with ♂. 11/6/03. s.s. "Pieter Faure." (S.A.M. Nos. A270-1, A2276.)

The host is unknown ; but in the same bottles were numbers of a deep-red Decapod allied to *Nematocarcinus* (at present awaiting identification), as well as a few specimens of *Acanthephyra purpurea*, *Glyphocrangon sculptus* and *Polycheles beaumontii*. The presence of one *Zonophryxus* in a bottle containing only *Nematocarcinus* may justify the view that this latter Decapod is the only host.

Only three other species of the genus are known : *Z. retrodens*, Richardson, 1904, from Hawaiian Islands ; *Z. trilobus*, Richardson, 1910, from Philippine Islands ; and *Z. grimaldii*, Koehler, 1911, off the coast of Portugal.

PLATE XVII. A.

Tamias spongicola, n. sp.

- ep. + l.s. Epistome and upper lip.
l.l. Lower lip.
mx. 1, 2. First and second maxillae.
gn. 1 ♂. First gnathopod male.
gn. 1 ♀. First gnathopod female.
pl. 4, 5, 6 + urop. Pleon segments 4, 5 and 6 with uropods.

PLATE XVII. B.

Guathia africana, n. sp.

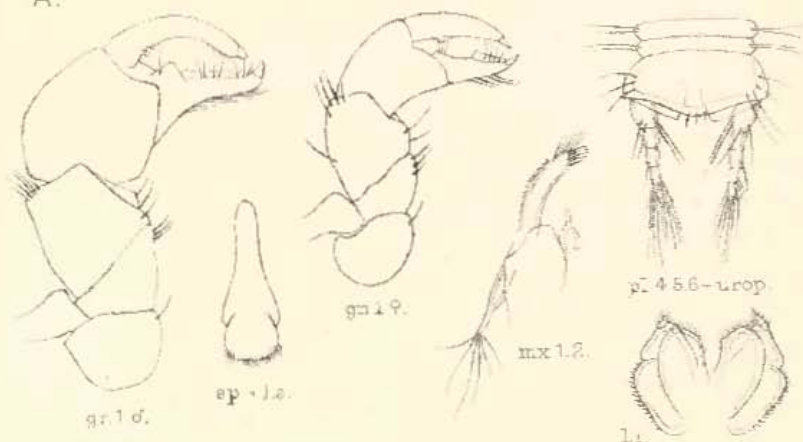
- n.s. ♂. Natural size male, peracopods omitted.
profile ♂. Profile of head of male.
ppp. Peracopod of male.
mand. mx. 1, 2, juv. Mandible and first and second maxillae of larva.
mxp. juv. Maxilliped of larva, with portion further enlarged.

PLATE XVII. C.

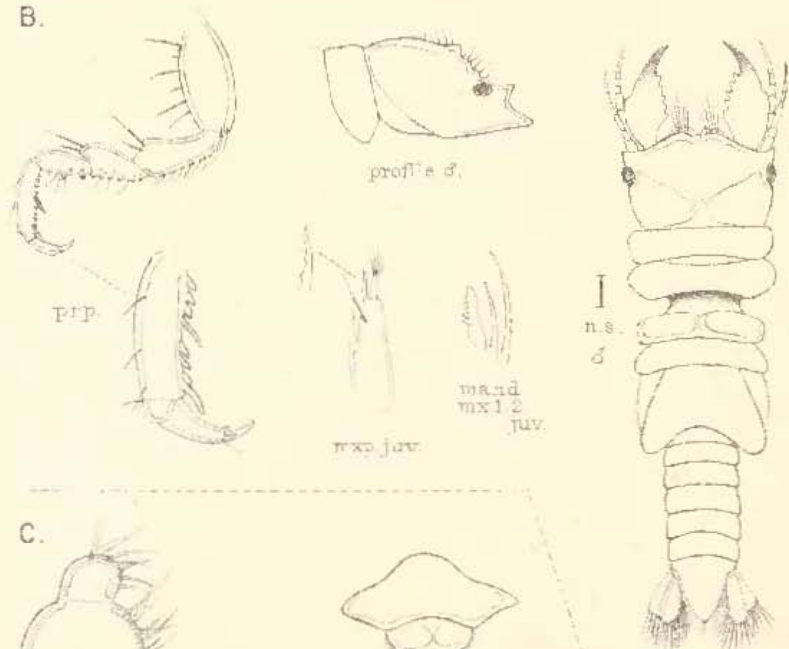
Eugidotea lobata (Miers).

- ant. 1. Upper antenna, with a group of setae further enlarged.
ep. + l.s. Epistome and upper lip.
l.l. Lower lip with marginal setae further enlarged.
mx. 2. Second maxilla.
mxp. Maxilliped with portion of 6th and 7th joints further enlarged.

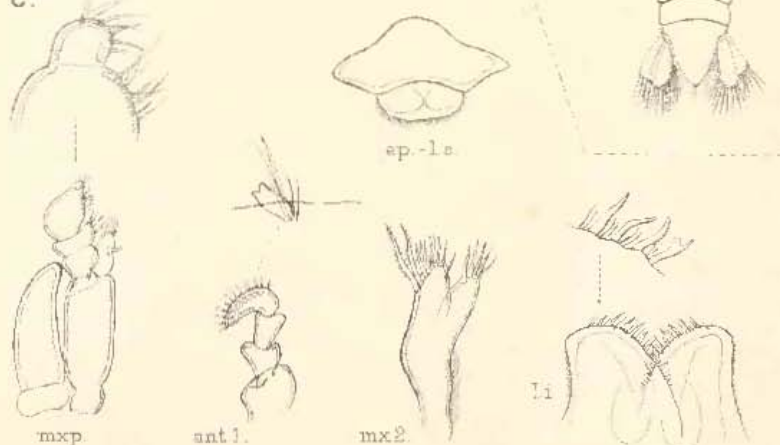
A.



B.



C.



K.E.B. del.

West, Newman lith.

A. TANAIS SPONGICOLA, n. sp. B. GNATHIA AFRICANA, n. sp.
C. ENGIDOTEA LOBATUS (Miers)

PLATE XVIII. A.

Synidotea setifer, n. sp.

- n.s. Natural size of specimen, peraeopods omitted.
ant. 1. First antenna.
ant. 2. Second antenna.
mand. Mandible with molar further enlarged.
max. Maxilliped.
pp. 1 (gn.). First peraeopod (gnathopod).

PLATE XVIII. B.

Antaectonus Holophorus, Stebbing.

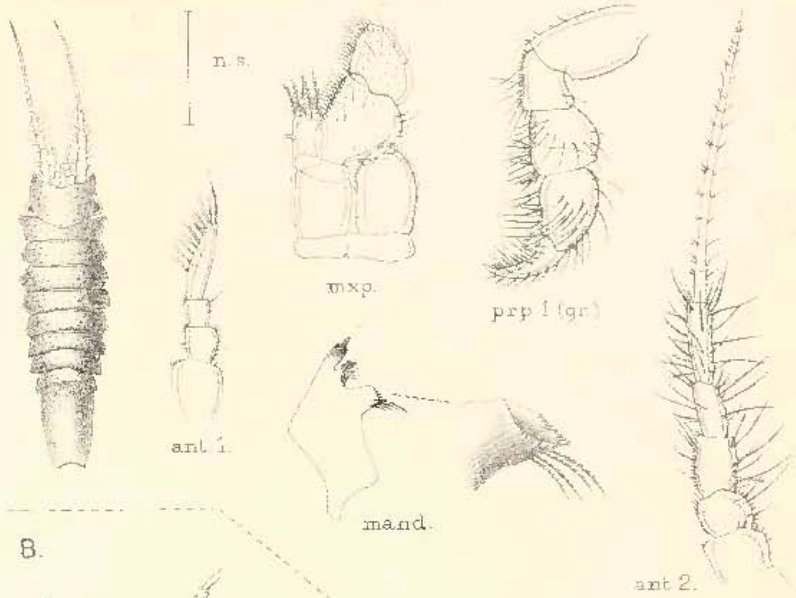
- n.s. ♂. Natural size of male, peraeopods not completely drawn in.
ant. 2. First three joints of second antenna.
l. mand. et. mand. Left and right mandibles.
pp. 1 (gn.). Seventh joint of first peraeopod (gnathopod), setae omitted, but one drawn on a larger scale.
pen. Male stylet on 7th pereon segment.
plp. 1. First pleopod.
plp. 2 ♂. Second pleopod of male.

PLATE XVIII. C.

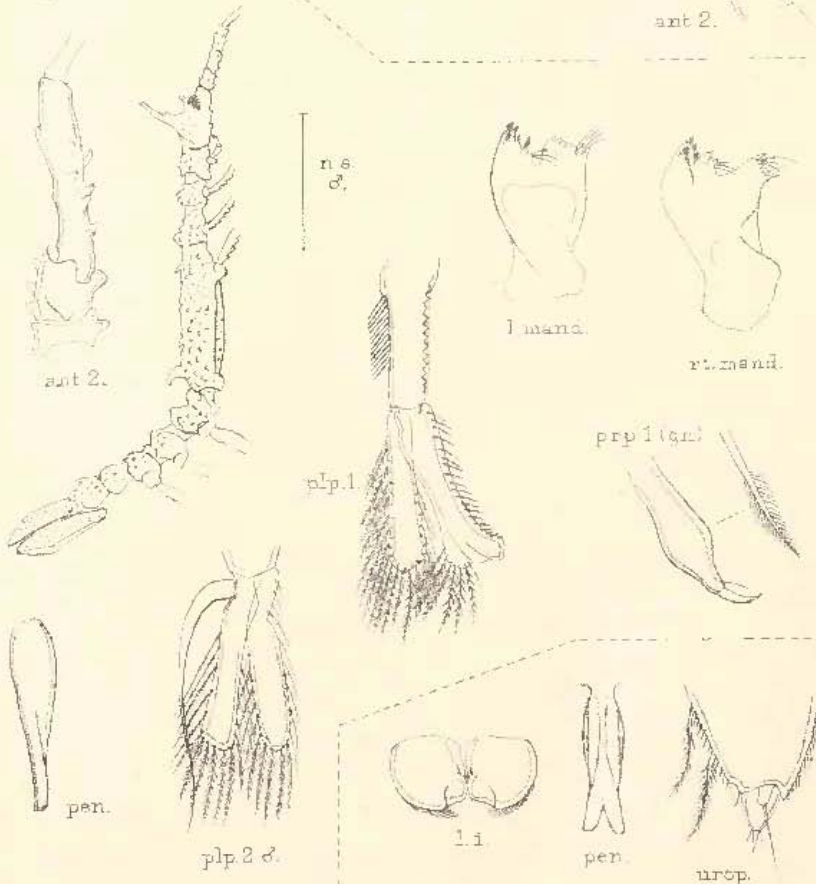
Neosarcturus onlops, n. g. et sp.

- li. Lower lip.
pen. Male stylet on 7th pereon segment.
urop. Terminal portion of uropod.

A.



B.



K.H.B. del.

West, Newman lith.

A. *SYNIDOTEA SETIFER*, n. sp. B. *ANTARCTURUS KLADOPHOROS*, Stebb
 C. *NEOARCTURUS OUDOPS*, n. sp. et sp.

PLATE XIX. A.

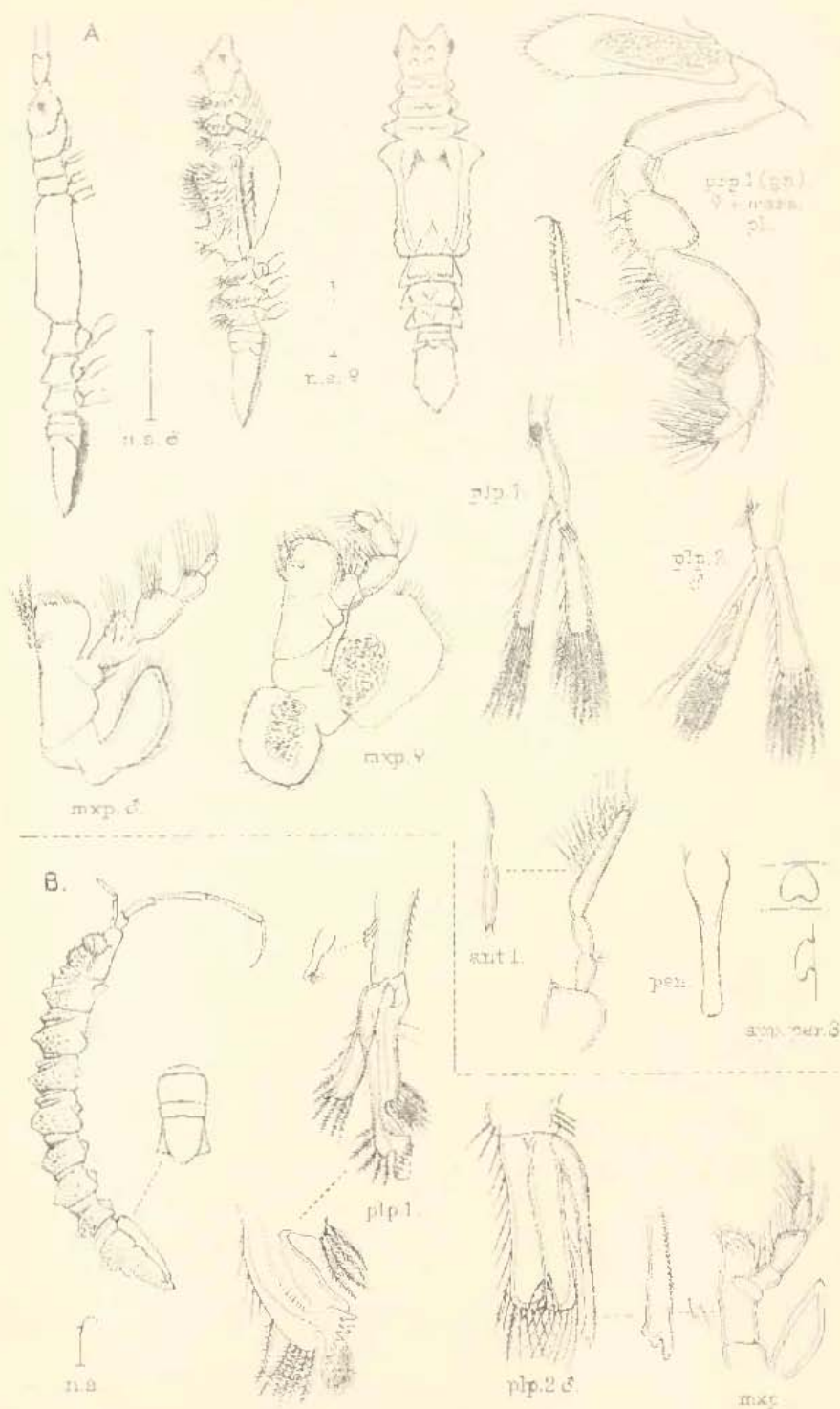
Aecteopsis hirsutus, n. sp.

- n.s. ♂, n.s. ♀. Natural size of male and female respectively, the latter drawn in lateral and dorsal views, bases only of pereopods indicated.
- ant. 1. First antenna with sensory filament further enlarged.
- mxp. ♂, mxp. ♀. Maxilliped of male and female.
- pp. 1 (gn.) ♀ + mars. pl. First pereopod of female with marsupial plate. One seta from 5th joint further enlarged.
- pen. Male stylet on 7th pereon segment.
- app. per. 3. Male appendage on 3rd pereon segment.
- plp. 1. First pleopod.
- plp. 2 ♂. Second pleopod of male.

PLATE XIX. B.

Neouretrus nudops, n. g. et sp.

- n.s. Natural size of specimen, in lateral view; pleon and telson in dorsal view; pereopods omitted.
- mxp. Maxilliped.
- plp. 1. First pleopod with hooked seta from peduncle and the terminal portion of exopod further enlarged.
- plp. 2 ♂. Second pleopod of male with apex of penial filament further enlarged.



K.F.F. del.

West, Newman. lith.

A. *ARCTIOPSIS HIRSATUS* n.sp. B. *NEOARCTURUS OUDOPS*, n.g. et sp.

PLATE XX. A.

Stenotrium crassimanus, n. sp.

- n.s. Natural size of specimen, peraeopods omitted.
li. Lower lip.
mxp. Maxilliped with coupling-hooks and apical armature of inner plate further enlarged.
pp. 1 (gn.) ♂. First peraeopod (gnathopod) of male.
pp. 1 (gn.) ♀. First peraeopod (gnathopod) of female, magnification twice that of male.
plp. 1 ♂. First pleopod of male.
plp. 2 ♂. Second pleopod of male.
plp. 4. Fourth pleopod.

PLATE XX. B.

Junca oypensis, n. sp.

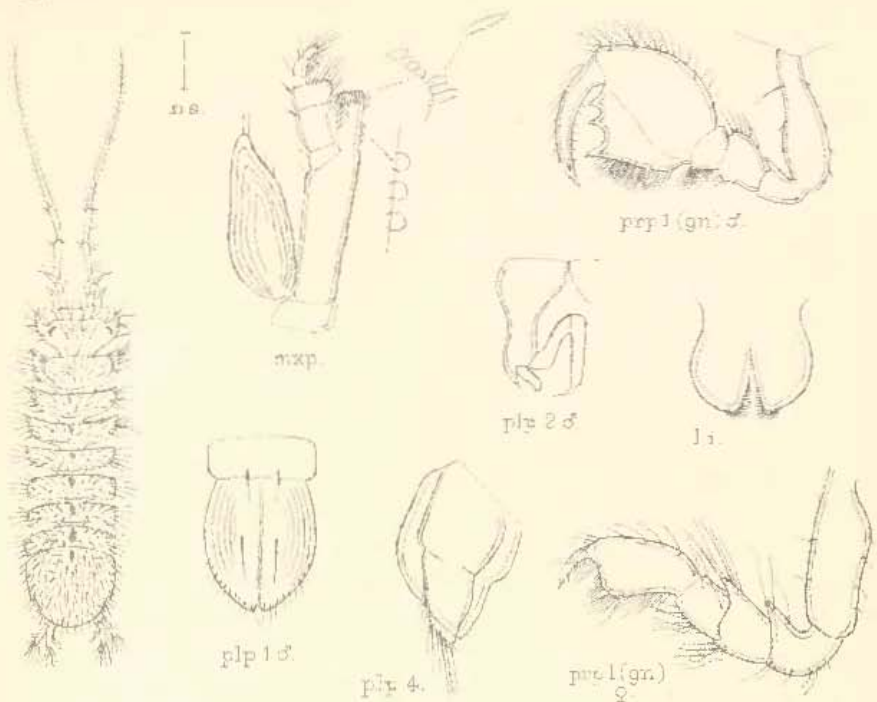
- mxp. Maxilliped.
pp. 1 (gn.) ♂. First peraeopod (gnathopod) of male, with 7th and terminal portion of 6th joints enlarged.
plp. 1 ♂. First pleopod of male.
plp. 2 ♂. Second pleopod of male.
plp. 3, plp. 4. Third and fourth pleopods.
tels. + urop. Portion of telson with one of the uropods.

PLATE XX. C.

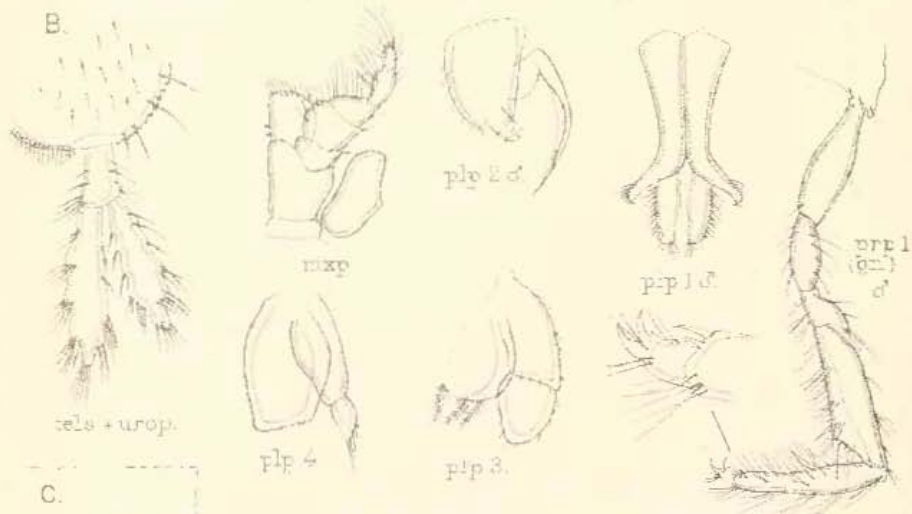
Javropsis curvicaulis, (Nicolet).

- plp. 1 ♂. First pleopod of male.
plp. 2 ♂. Second pleopod of male.
plp. 3, plp. 4. Third and fourth pleopods.
urop. Uropod.

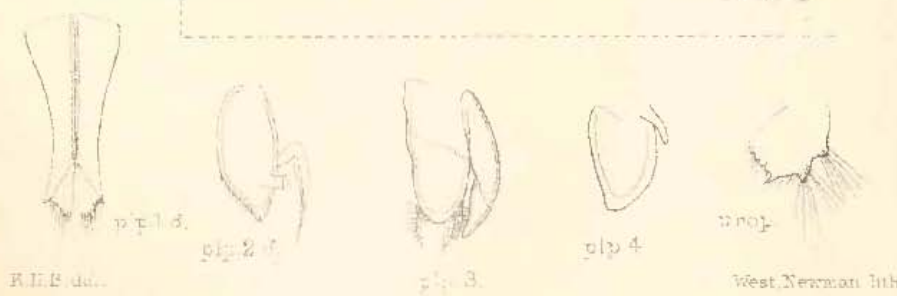
A.



B.



C.



A. STENETHIUM CHASSIMANDAE, n. sp. B. JANIRA CAPENSIS, n. sp.

C. JAPROPSIS CURVICORNIS, (Nicolet.)

PLATE XXI. A.

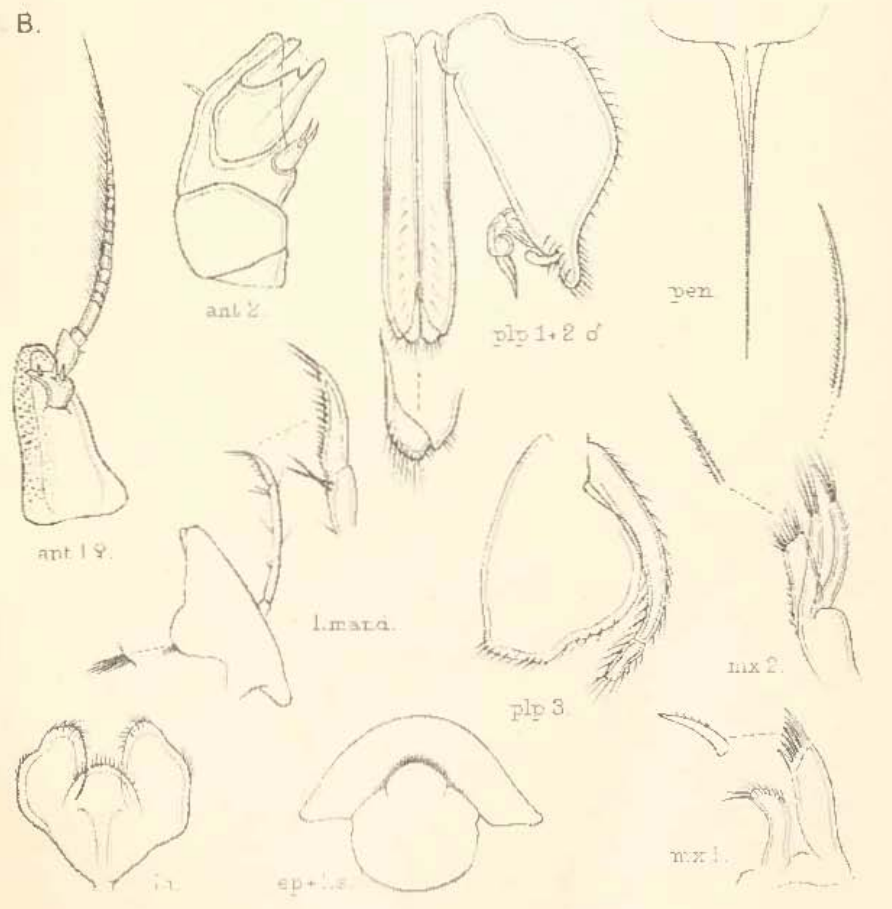
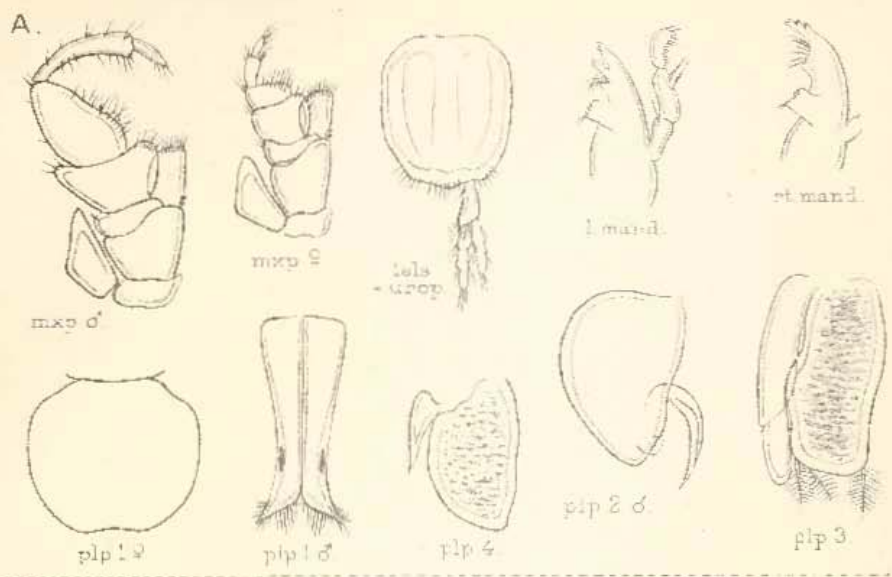
Jantropsis palpalis, n. sp.

- l. mand. rt. mand. Left and right mandibles.
mxp. ♂, mxp. ♀. Maxillipeds of male and female respectively.
plp. 1 ♂. First pleopod of male.
plp. 1 ♀. First pleopod (operculum) of female.
plp. 2 ♂. Second pleopod of male.
plp. 3, plp. 4. Third and fourth pleopods.
tels. + urop. Telson with one of the uropods.

PLATE XXI. B.

Munnopsurus minus, n. sp.

- ant. 1 ♀. Right first antenna of female viewed from above.
ant. 2. First four joints of peduncle of left second antenna, viewed from below.
ep. + ls. Epistome with upper lip.
ll. Lower lip.
l mand. Left mandible with brush on molar and terminal portion of palp further enlarged.
mx. 1. First maxilla.
mx. 2. Second maxilla with setae from outer and inner plates further enlarged.
pen. Male stylct on 7th pereon segment.
plp. 1 + 2 ♂. First and second pleopods of male, with apex of first pleopod further enlarged.
plp. 3. Third pleopod.



K.H.H.de.

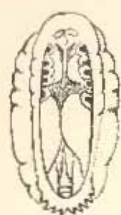
West. Newman del.

A. *LANIROPSIS PALFALIS*, n. sp. B. *MUNKOPSURUS MIMUS*, n. sp.

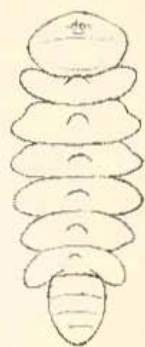
PLATE XXII.

Zonopharyx quinquedens, n. sp.

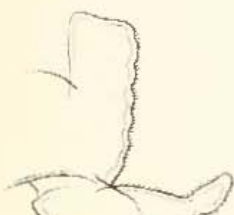
- n.s. Natural size of adult female, drawn in dorsal and ventral views
n.s. ♀ juv. Natural size of young female with *Cryptoniscus* male attached
n.s. ♂. Natural size of male.
ant. 1 + 2 ♀. Left first and second antennae of female.
ls ♀. Upper lip of female.
li ♀. Lower lip of female.
mand. ♀. Mandible of female.
l. mx. ♀. Left maxilla of female.
rt. mxp. ♀. Right maxilliped of female.
pp. ♀. Peraeopod of female.
pp. ♀ juv. Peraeopod of young female.
plp. ♀. Pleopod of female.
mand. ♂. Mandible of male.
pp. ♂. Peraeopod of male.
head + app. Crypt. Head of *Cryptoniscus* larva with first and second antennae and rostral cone.
pp. 3. Crypt. Third peraeopod of *Cryptoniscus* larva.
pl. 6 + urop. Crypt. Sixth pleon segment with uropods of *Cryptoniscus* larva.



n.s.
♀ juv.



ant 1 + 2 ♀



l.mx ♀



prp ♂



mand ♂

n.s.
♂ I



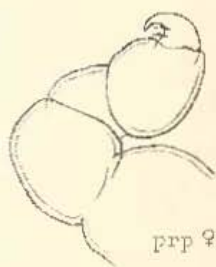
rt. mxp ♀



mand ♀



prp ♀



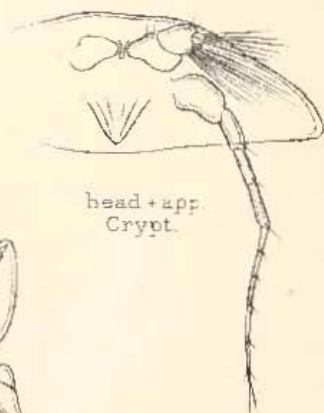
prp ♀



l.a. ♀



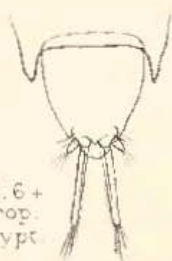
l.l. ♀



head + app
Crypt.



prp ♀ juv.



p. 6 +
urop.
Crypt.



prp 3
Crypt.

2.—DESCRIPTION OF A NEW SPECIES OF PHREATOICUS (ISOPODA)
FROM SOUTH AFRICA.

(Plates XXIII. and XXIV.)

The tribe *Phreatoicidea*, Stebbing, was instituted to receive some peculiar Isopods resembling most nearly the *Asellota*, but differing from them in certain respects and possessing also an external likeness to the Amphipoda. It contains a single family, comprising, besides the typical genus with eight species, three other genera each with only one species.

The following is a list of all the hitherto known species.

TRIBE PHREATOICIDEA, Stebbing, 1893.

FAMILY PHREATOICIDAE, Chilton, 1891.

1. GEN. PHREATOICUS, Chilton, 1882.

1. *P. typicus*, Chilton, 1882. A blind species, from wells near Canterbury, New Zealand.
2. *P. australis*, Chilton, 1891. With eyes, from Mt. Kosciusko, 5,700 ft., Victoria, Australia.

Thompson, 1892, reported this species from Mt. Wellington, Tasmania, but subsequently (1894) referred his original specimen to the young of his species *P. tasmaniae*. Since then Smith, 1909, has recorded *P. australis* from several localities in Tasmania, from sea-level to the top of Mt. Wellington, 4,000 ft. According to the arrangement of spines on the uropods he distinguishes three varieties, to which, however, he does not give separate names.

3. *P. assimilis*, Chilton, 1894. Blind, from wells near Canterbury, New Zealand.
4. *P. tasmaniae*, Thomson, 1894. With eyes, from the Great Lake, 3,000 ft., Tasmania.

5. *P. shephardi*, Sayce, 1900a. Blind, from a surface spring at 2,000 ft., near Melbourne, Australia.
6. *P. kirbyi*, Chilton, 1906. Blind, from fresh-water lagoon, New Zealand.
- 6a. *P. k.* var. *dunedinensis*, Chilton, 1906. Blind, from streams near Dunedin, New Zealand.
7. *P. spinosus*, G. Smith, 1909. With eyes, from the Great Lake, 3,000 ft., Tasmania.

This species is very similar to *P. tasmaniae*, especially as regards the telson and uropods. *P. tasmaniae* was described from a dried specimen, and Smith apparently has not seen this paper, since he quotes Thomson's record of *P. australis* from Mt. Wellington and makes no reference to Thomson's own correction in 1894. According to Thomson the young of *P. tasmaniae* differs from older specimens ($\frac{1}{2}$ inch) as regards the spines on the body, so that it is possible that *P. spinosus* (Smith gives its length as 15-25 mm.) is only a larger form of *P. tasmaniae*, though the 5th pleon segments differ.

8. *P. brevicaudatus*, G. Smith, 1909. With eyes, from the Great Lake, 3,000 ft., Tasmania.

2. GEN. PHREATOICOPSIS, Spencer and Hall, 1897.

1. *P. terricola*, Sp. and Hall, 1897. With eyes, burrowing in the banks of the Upper Gellibrand River, Victoria, Australia.

3. GEN. PHREATOICOIDES, Sayce, 1900.

1. *P. gracilis*, Sayce, 1900. Blind, from surface runnels, Gippsland, Victoria, Australia.

4. GEN. HYPSIMETOPUS, Sayce, 1902.

1. *H. intrusor*, Sayce, 1902. Blind, in the burrows of the land-crabfish *Engaeus*, Tasmania.

From the above it will be seen that the family is distributed thus: New Zealand 3 species (1 genus); Australia 4 species (3 genera); and Tasmania 5 species (2 genera). Only one species is common to any two regions, namely, *P. australis* from Australia and Tasmania. The distribution of the family is thus a very narrow one. Sayce, 1902, remarks that it would be interesting to know

if any representatives were found in South America. The discovery of a species on Table Mountain, South Africa, is therefore of great interest, as being one more fact in support of the existence of an ancient land-mass connecting the Southern continents (Gondwanaland).

PHREATORICUS CAPENSIS, n. sp.

(Plates XXIII. and XXIV.)

Specific diagnosis. Body rather stout, surface with short scattered hairs, eyes well developed, head not as long as first and second peraeon segments together, first and second peraeon segments subequal in length, penultimate joint of first antenna as long as the preceding three joints together, second antenna four-sevenths of the total length, right mandible with secondary cutting-edge, sixth joint of first peraeopod (gnathopod) with the palm not well defined, fifth pleon segment as long as third and fourth together, with the posterior margin notched, pleopods 3-5 with epipodites, telson deeply concave above the terminal projection, lower margin straight, uropods not extending beyond end of telson.

Colour: Slaty-grey with lighter crescentic mottlings on sides of the peraeon and pleon; they are large on the anterior segments, but become smaller posteriorly.

Length: Up to 14 mm.

Habitat: Four specimens from near the reservoir on the top of Table Mountain (C. J. French, March 4, 1913). On May 1, 1913, Mr. S. H. Haughton and myself found numerous specimens under the moss growing on the stones in the bed of a swiftly running stream, near the reservoir at an altitude of about 3,000 ft. Several of them were pairing; the males are slightly larger than the females.

Prof. E. Goddard tells me he found the species some years ago on Table Mountain, but did not describe it. I have to express my thanks to him for permitting me to do this, and also for giving me Tasmanian specimens of *P. australis* for comparison.

The following detailed description is taken from the three largest specimens (11-14 mm.), 2♂♂ and 1♀; these specimens are in the South African Museum (No. A2257).

The *Body* is rather stout, the pleon long in proportion to the rest of the body. Using Sayce's method and reckoning the cephalon and peraeon as 100, then the pleon measures 70-75. The greatest depth of the pleon is equal to the breadth of the peraeon segments and a little more than twice their depth. The surface of the head

and anterior peraeon segments with irregular shallow depressions, which become obsolete on the posterior peraeon segments and pleon. Hairs on the peraeon and pleon short and scattered, most abundant on the 6th pleon segment.

The *Head* in profile is subtriangular, convex in front. Longer than the 1st peraeon segment but shorter than the 1st and 2nd segments together. Eyes well developed. Below the eyes is a small notch from which a groove runs backwards parallel with the inferior margin and defining the cheek. Frontal and inferior margins emarginate. Near the posterior margin is a groove running out to the rounded intero-posterior angle of the head.

The *Peraeon*. First segment rather closely attached to the head, a little longer in the centre than at the sides. Inferior angles rounded, not produced, inferior margin convex. Segments 2, 3, 4 nearly as long as and a little deeper than the first; inferior margins emarginate, infero-anterior angles rather pointed. Segments 5, 6, 7 a little deeper than the preceding ones; 5 and 6 a little shorter than 4, 7 half the length of 1. Inferior margins, especially of 5 and 6, excavate.

Epimera of segments 1-4 bilobed, the lobes rounded with a few hairs on each. Epimeron 1 nearly as long as its segment, epimera 2, 3, 4 distinctly shorter than their respective segments. Epimera 5, 6, 7 subtriangular, anterior angles rounded, posterior angles pointed, with a few hairs.

The *Pleon*. Its length (with telson) is twice its depth. Pleura well developed, concealing the pleopods in their natural position. Pleuron 1 nearly as deep as its segment, pleura 2, 3, 4 equal to or slightly longer than their respective segments, pleuron 5 nearly twice as long as its segment. Inferior margins rounded, beset with numerous hairs. Segment 1 not quite as long as peraeon segment 7, segments 2, 3, 4 gradually increasing in length; the fifth as long as the third and fourth together, posterior margin deeply notched where pleuron joins the segment; the sixth segment and telson together as long as the fourth and fifth together, infero-anterior angle rounded with 3 strong setae and a few hairs. No groove or ridge defining the junction of telson with the 6th pleon segment.

The *Telson* in profile is strongly convex above with a deep concavity above the terminal projection. This is bluntly tridentate with two strong spines and a few hairs; one strong spine in a slight notch on either side of the terminal projection and another strong spine further back and some little way within the inferior

margin. Inferior margin straight, both from below and from the side, fringed with hairs.

The *First Antenna* reaches to the middle of the 5th joint of peduncle of second antenna. Its peduncle consists of 3 joints: the first stout, the second subequal but narrower, the third a little longer and more slender than the second. Apices of each joint with setae. The flagellum equals in length the peduncle and consists of 5 joints, of which the first three are subequal in length and little more than half the length of the last joint of the peduncle; the fourth is as long as the three preceding ones together; the fifth minute. All the apices with fine hairs.

The *Second Antenna* reaches to the end of the peraeon and is four-sevenths of the total length. Peduncle of 5 joints; first two short and stout, next two longer and more slender and subequal in length; the fifth half as long again as fourth. The flagellum is $2\frac{1}{2}$ times as long as the peduncle and consists of about 30 joints; the first is composed of 2 or 3 incompletely fused joints, the remaining joints become longer and more slender towards the end. Apices of all with fine setae, but without calceoli.

The *Upper Lip* is evenly rounded, with terminal and lateral patches of hairs. The epistome is notched in the centre of the anterior margin.

The *Mandibles*. The left mandible is of the normal form, main cutting-edge with 4 obliquely set teeth, inner cutting-edge (lacinia mobilis) with 3 teeth; both edges strongly chitinized. The right mandible is unusual in having also two cutting-edges; the outer with 4 teeth, the inner with 3, but the inner edge is less strongly chitinized than that in the left mandible, being quite pale in colour. First joint of the palp the shortest, third a little longer, second half as long again as first. Anterior margin of third joint with a thick fringe of stout and simple (not plumose) setae.

The *Lower Lip*. Lobes oblong, apically rounded, the outer margin oblique distally, straight towards the base. Outer margin distally with a dense fringe of long hairs, inner margin with shorter hairs.

The *First Maxilla* has the outer lobe gently curved, margins parallel, apex with 12-13 teeth, some of the inner ones being dentate. Inner lobe shorter and a little narrower, apex with 4 strongly plumose setae, and 2 which arise from the bases of the first and third plumose setae and are plumose only at the tips.

The *Second Maxilla* has the outer articulated lobe half as broad again as the inner; outer margins of both convex, extremities

obliquely truncated, the outer with 19, the inner with 15 long setae denticulated on their inner edges. Inner fixed lobe rounded at apex, with a number of fine setae, the innermost ones being plumose. Inner margin slightly concave with a thick row of simple setae.

The *Maxillipeds*. Epipodite almost rectangular, very slightly longer than broad, the angles rounded, reaching to end of the second joint of exopodite. The basos a little more than twice as long as broad; ischios very short; meros produced externally for three-quarters the length of the carpus; carpus rather sunk in meros with external margin straight and internal margin convex; propodos ovate longer than broad; dactylos narrow lanceolate, as long as propodos. Endopodite arises from the basos and reaches to the middle of the carpus, bearing externally long plumose setae and internally 2 coupling spines.

The *First Peracopod (Gnathopod)*. In the first as in all the legs the coxos is fused with the epimeron. The basos is twice as long as broad; ischios two-thirds length of basos and narrower; meros sub-triangular broader than long, anteriorly produced into a pointed process; carpus as long as broad, broader than third; propodos obovate, proximally twice as broad as distally, anterior margin evenly rounded, palm not well defined, slightly concave, beset with numerous setae and about 7 spines. These spines are tubercular in shape at the distal end, but towards the base of the palm gradually approximate to the ordinary form of setae, and eventually are indistinguishable from the setae fringing the base of the hand. The dactylos is strongly curved at the base, but distally nearly straight; a minute secondary unguis at base of the terminal one, and behind that some very minute denticulations.

The gnathopod of the female differs hardly at all from that of the male; the hand is equally developed and of the same form. The spines on the palm, however, are bicuspid and more slender.

The *Second and Third Peracopods*. The basos is twice as long as broad; ischios two-thirds length of basos and also twice as long as broad; meros as long as ischios, subtriangular, anterior margin expanded distally; carpus a little shorter than meros; propodos as long as ischios; both the carpus and propodos have strong spines on the posterior margins; dactylos a little more than half the length of the propodos, with secondary unguis and an apical tuft of setae.

The *Fourth Peracopod* is a little shorter than the preceding ones. The basos $2\frac{1}{2}$ times as long as broad; ischios two-thirds length of basos; meros a little shorter and expanded distally; carpus as long as meros, rather swollen, anterior margin with 3 apical setae and one further back, posterior margin with 6 very stout and long spines and a few finer setae; propodos a little longer than and at right angles to carpus, distal end prolonged externally beyond the articulation with the dactylos, anterior margin with an apical tuft and a few setae behind, posterior margin with 3 stout spines on a slightly convex palm and a few fine setae; dactylos shorter than and at right angles to propodos, curved, with secondary unguis, an outer apical tuft of setae and a few very fine ones on inner margin. The female differs from the male in the following points: the carpus is less swollen; the propodos more slender, the length being 3 times the breadth instead of twice; the dactylos less curved; the convex palm is hardly developed and the spines on both carpus and propodos are more slender.

The *Brood-pouches* in the female are developed on the 2nd, 3rd and 4th peraeon segments.

The *Fifth, Sixth and Seventh Peracopods*. The fifth is slightly longer than the preceding ones and the sixth and seventh are longer than the fifth. They agree with each other except in the width of the basos; this in the 5th and 6th legs is one-half the length, in the 7th two-thirds. The ischios joint is three times as long as broad; the meros a little more than two-thirds the length of the ischios, with a distal prolongation on posterior margin; carpus joint nearly as long as ischios, its length nearly 4 times its breadth; propodos as long as carpus but more slender; dactylos half as long as propodos, with secondary unguis, apical tuft of setae and a few fine ones on the inner margin.

The setae of all the legs, but especially those of the last three pairs, are covered with numerous short-stalked Infusoria.

The *Male appendages* on the seventh peraeon segment are curved towards one another, not swollen at the base, with blunt apices and a few hairs, chiefly on the inner margin.

The *First Pleopod*. Protopodite rectangular; exopodite and endopodite lanceolate, the former rather narrower and more pointed than the latter, both with a few plumose setae on outer margins and apices.

The *Second Pleopod*. Protopodite subtriangular with 2 setae on its inner distal apex. First joint of exopodite produced proximally into a rounded lobe: both margins gently convex, the inner with

fine simple setae, the outer with plumose setae; apex oblique, scarcely hollowed to receive the second joint, which is more than twice as long as broad, with long plumose setae. Endopodite as long as first joint of exopodite, outer margin strongly curved, with a few setae becoming plumose distally, inner margin straight, apex rounded. These parts are similar in both sexes. The penial filament of the male extends to the end of the endopodite, with which it is fused for about one-half its length. The fused portion bears very minute hairs, the free portion on outer margin (*i.e.*, away from endopodite) small setae at regular distances apart, and becoming longer towards the apex, which is slightly bent over. In another specimen the penial filament is a little shorter than the endopodite with which only the basal third is fused.

The *Third Pleopod*. Protopodite triangular with internal apical tuft of setae. First joint of exopodite shorter and stouter than that of the second pleopod; length about $1\frac{1}{2}$ times its breadth, apex oblique and slightly hollowed to receive the second joint, which is $1\frac{1}{2}$ times as long as broad, obovate. Endopodite reaching to the middle of the second joint of exopodite, external margin very convex, inner straight. Epipodite subtriangular, external margin strongly rounded, inner slightly convex. Setae on the epipodite, inner and proximal portion of outer margin of 1st joint of exopodite simple, those on distal portion of the first joint and on the 2nd joint of exopodite and apex of endopodite plumose.

The *Fourth Pleopod* is very similar to the third, but apex of the 1st joint of exopodite is less oblique and more hollowed out for the 2nd joint, which is proportionately broader. Epipodite more semicircular in shape.

The *Fifth Pleopod*. First joint of exopodite larger than in any of the preceding pleopods, proximally rather bulging; breadth of the 2nd joint two-thirds its length. Endopodite does not reach the middle of the 2nd joint, and the inner margin is convex. Epipodite semicircular.

The *Uropods* reach to the end of the telson, but not beyond. Peduncle stout, twice as long as broad, grooved on its upper surface. Both of the upper margins with 3 spines and a few smaller setae, inferior margin with 4 spines increasing in length distally and shorter ones at the apex. Inner ramus a little longer than the peduncle, straight, upper margin with 3 spines in the middle and one near the apex, as well as a few small setae, lower margin with a small spine near the apex and 2-3 fine setae. Outer ramus not quite as long as peduncle, upper margin with 2 spines and a few

setae, lower margin with a small spine near the apex and 2-3 fine setae.

Affinities. As regards the shape of the telson this species bears most resemblance to *P. brevicaudatus*, except that the lower margin of the telson in the latter is convex and not straight as in the former. *P. capensis* is further distinguished by the notched 5th pleon segment and the longer second antennae, with a flagellum of 30 joints; that of *P. brevicaudatus* having only 19. A comparison with the mouth-parts and pleopods of *P. brevicaudatus* or *P. spinosus* is unfortunately impossible owing to the brevity of Smith's descriptions.

In the proportional length of pleon plus telson to cephalon plus peraeon *P. capensis* is near to *P. tasmaniae*, $\frac{7.0}{10.0}$ - $\frac{7.5}{10.0}$ in both species; this proportion is a good deal higher than in any other species and is only exceeded in *P. spinosus*, where it is $\frac{10.0}{10.0}$. From *P. spinosus* *P. capensis* differs in having a notched 5th pleon segment, and from *P. tasmaniae* by the absence of a well-defined palm on gnathopod and in the shape of the ischios and meros of the maxillipeds; they agree, however, in having simple setae on the inner margin of the fixed lobe of the second maxillae.

The only other species which *P. capensis* somewhat resembles in the shape of the telson is *P. australis*; they agree also as regards the 1st and 2nd maxillae, the maxillipeds and the palm of the gnathopod. The differences are these: in *P. australis* the upper lip has no lateral as well as terminal patches of hairs, the epistome has an entire distal margin, the lower lip is slightly different in shape, the spine-row on the left mandible is far more conspicuous, the basos of the peraeopods is more expanded and the uropod has 2 very stout spines at the apex of the lower margin.

The most distinctive feature of *P. capensis* is the secondary cutting-edge in the right mandible. Hitherto the only member of the family in which this has been found is *Phreatoicopsis terricola*. In *Phreatoicus typicus*, *australis* and *assimilis* it is described as absent in the right mandible; in Tasmanian specimens of *australis* I have myself failed to find it. In the descriptions of the other species of *Phreatoicus* the right mandible has not been specially mentioned, so that it is possible that some or all of these species may be found to possess a secondary cutting-edge in the right as well as the left mandible.

P. capensis has no other characters in common with *Phreatoicopsis*, but agrees perfectly with *Phreatoicus*. It would, however, be interesting to know whether the penial filament on the 2nd

pleopod in *Phreatoicopsis* is free or fused in part with the endopodite. It is free in both *Phreatoicoides* and *Hypsimetopus*, but fused in *Phreatoicus*.

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PLATE XXIII.

Phreatoicus cypensis, n. sp.

Whole animal enlarged nearly 5 times; n.s. natural size. The pleopods in their natural position do not project beyond the pleura, as shown in the figure.

u. 1. Upper antenna, with tip further enlarged.

a. 2. Lower antenna.

l.s. Upper lip.

l.i. Lower lip.

l. mand. Left mandible from within, the two cutting edges further enlarged.

mx. 1. First maxilla, apices of the lobes further enlarged, and one of the dentate spines from the outer lobe.

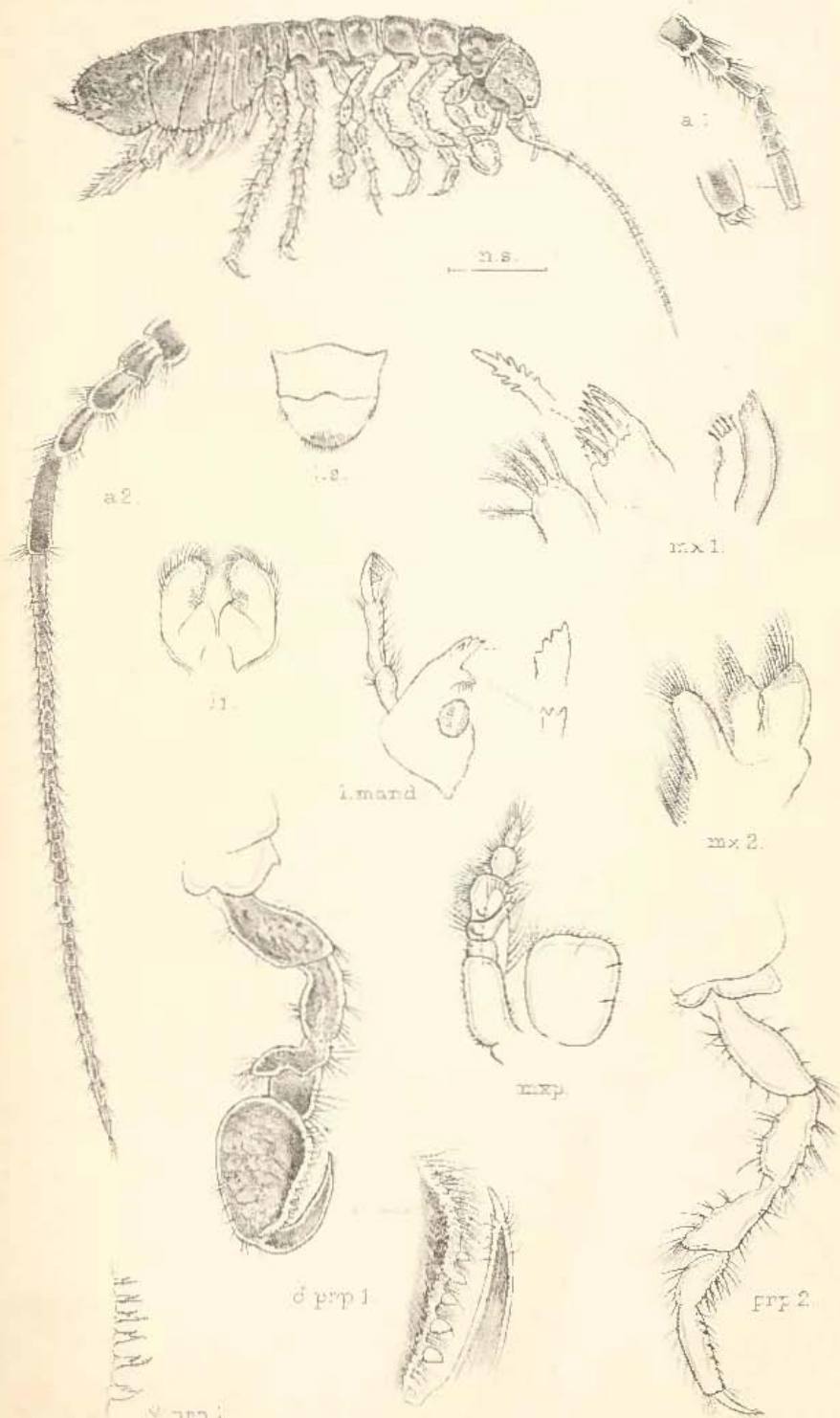
mx. 2. Second maxilla.

mxp. Maxilliped.

♂, prp. 1. Left first peraeopod of male, with palm and finger further enlarged.

♀, prp. 1. Left first peraeopod of female, with spines from the palm enlarged.

prp. 2. Left second peraeopod.

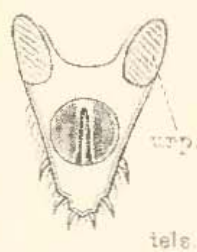
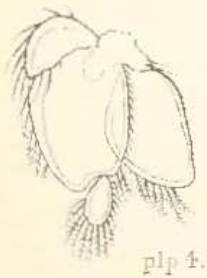
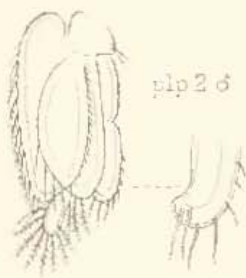
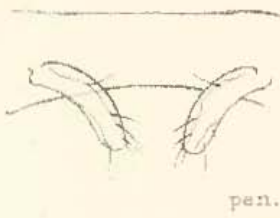


PHREATOICUS CAPENSIS, n. sp.

PLATE XXIV.

Phreatoicus capensis, n. sp.

- ♂, prp. 4. Left fourth peraeopod of male, with last three joints further enlarged.
♀, prp. 4. Left fourth peraeopod of female, last three joints.
prp. 5. Left fifth peraeopod.
pen. Male appendages on 7th thoracic segment.
plp. 1. Right first pleopod.
♂, plp. 2. Right second pleopod of male with apex of penial filament further enlarged.
♀, plp. 2. Right second pleopod of female.
plp. 3, plp. 4, plp. 5. Third, fourth and fifth pleopods of the right side.
tels. Telson, showing anus and articulation of uropods (urop.) with 6th pleon segment.
urop. Left uropod.



K.R. Bacl.

West, Newman lith.

