VII.—Notes on the Pelagic Entomostraca of Durban Bay,

by

G. Stewardson Brady, M.D., LL.D., D.Sc., F.R.S.

WITH PLATES IX-XIV.

FOR the opportunity of examining and describing the species here noted I am indebted to the authorities of the Durban Museum. The material was collected by Mr. D. R. Boyce, the Museum Assistant and Collector, by means of the tow-net on nine separate occasions, extending over a period of two months, from the end of February to the beginning of May. It was sent to me in nine tubes, the contents differing only as regards the state of wind and tide under which the various nettings were made: there was necessarily a good deal of similarity among the different samples and it did not seem needful to keep separate lists.

The following list embraces all the species met with. Those found in abundance were Eucalanus attenuatus, Euchata prestandrea, Scolecithrix dana, Centropages chierchia, Candacia pachydactyla, Pontella natalis, Setella gracilis, Corycaus longistylis and C. speciosus. On the other hand, several forms occurred very sparingly, in numbers of not more than three or four. These are Calanus propinguus, Acrocalanus longicornis, Metranura typica (one only), Drepanopus furcatus, Centropages orsinii, C. violaceus, Leuckartia flavicornis!, Labidocera chubbi, L. kröyeri, L. trispinosa, Pontella fera, Pontellopsis speciosus, Oithonopsis farrani, Euterpe gracilis, Miracia efferata, Pachysoma punctatum, Peltidium rubrum.

The new genera which I have had to describe are Metranura, Isocope and Oithonopsis, in addition to which are the following new species belonging to already recognised genera, Labidocera chubbi, Pontella natalis, Oithona erythrops, Pontellopsis speciosus, Peltidium rubrum and P. cinereum. My identifications of the various species of Sapphirina must be taken cum grano salis; the distinctions between many of the numerous described forms are so subtle and, as it seems to me, often so trivial that it is a matter of no little difficulty to assign specimens rightly.

CLADOCERA.

Evadne gibsoni, Brady.
Penilia schmackeri, Richard.

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COPEPODA.

Calanus propinguus, Brady. Eucalanus attenuatus (Dana). Rhincalanus cornutus, Dana. Acrocalanus longicornis, Giesbrecht. Metranura typica, gen. and sp. nov. Euchæta prestandreæ, Philippi. Scolecithrix dana (Lubbock). Undina vulgaris, Dana. Undina darwinii, Lubbock. Drepanopus furcatus, Brady. Centropages furcatus (Dana). Centropages violaceus (Claus). Centropages orsinii, Giesbrecht. Centropages chierchiæ, Giesbrecht. Temora dubia, Lubbock. Temora africana, Brady. Lenckartia flavicornis, Claus.? Candacia pachydactyla (Dana). Candacia truncata (Dana). Candacia curta (Dana). Labidocera detruncatum (Dana). Labidocera chubbi, sp. nov. Labidocera kröyeri (Brady). Labidocera trispinosa, Esterley. Labidocera acuta (Dana). Labidocera inermis (Brady). Pontella fera, Dana. Pontella natalis, sp. nov. Pontellopsis speciosus, sp. nov. Aphelura typica, Brady. Isocope propinqua, gen. and sp. nov. Pontelluia plumata (Dana). Acartia longisetosa, Brady. Acartia nana, Brady. Acartia erythraa, Giesbrecht. Oithona erythrops, sp. nov. Oithonopsis farrani, gen. and sp. nov. Euterpe gracilis, Claus. Setella gracilis, Dana. Miracia efferata, Dana.

Pachysoma punctatum, Claus.
Peltidium rubrum, sp. nov.
Peltidium cinereum, sp. nov.
Oncæa venusta, Philippi.
Corycæus longistylis, Dana.
Corycæus speciosus, Dana.
Corycæus gracilicandatus, Giesbrecht.
Copilia mirabilis, Dana.
Sapphirina ovalis, Dana.
Sapphirina angusta, Dana.
Sapphirina opalina, Dana.
Sapphirina stellata, Giesbrecht.
Sapphirina sinuicanda, Brady.
Sapphirina gemma, Dana.

CLADOCERA.

GENUS PENILIA, Dana.

Penilia schmackeri, Richard. Plate IX, fig. 14.

For the identification of this interesting species, previously unknown to me, I am indebted to the kindness of Dr. Calman. It would appear that all the so-called species hitherto described, viz.: P. pacifica, avirostris and orientalis, are probably referable to the earlier P. schmackeri of Richard. A few scattered specimens occurred in the Durban plankton gatherings.

COPEPODA.

GENUS CALANUS, Leach.

Calanus propinquus, Brady.

Of this only one specimen was seen.

Eucalanus attenuatus was abundant, but of Rhincalnus cornutus and Acrocalanus longicornis there were only about half-a-dozen.

GENUS METRANURA, gen. nov.

Closely allied to *Paracalanus* and *Acrocalanus*, but distinguishable by the oviferous furcal laminæ, which open externally by a short duct. Five pairs of swimming feet as in *Calanus*, terminal portion of the last joint of the third and fourth exopodites denticulated on their outer margins; mouth organs as in *Calanus*.

METRANURA TYPICA, sp. nov. Plate IX, figs. 1-6.

Female. Anterior antenna of the right side twenty-five jointed, setae of the two terminal joints long and plumose; antenna of the left side only half as long, fourteen jointed, terminal joints bearing long setae as on the right side. Abdomen four-jointed (fig. 3), the genital segment not much longer than the following two segments; furcal laminae short, about twice as long as the preceding very short abdominal joint, each lamina containing a well-defined ovarian capsule (fig. 4) which opens apically by a short, wide duct: caudal setae three, very stout, but in this specimen broken off near the base.

Male unknown.

The single specimen above described was found in a gathering taken "with the incoming tide and a high sea." It has no appearance of being much mauled, and if the shorter antenna is a result of having been broken, it has at-any-rate repaired itself, and developed a complete set of apical setæ.

GENUS LABIDOCERA, Lubbock.

Labidocera Chubbi, sp. nov. Plate IX, figs. 7-13.

Male. Posteriorly the cephalothorax is rather abruptly truncated, with angles symmetrically produced backwards (fig. 12), abdomen slender, five-jointed (fig. 11), caudal laminæ about as long as the last two segments conjointly and only slightly divergent; the right anterior antenna is of the usual geniculated type, with finely pectinated marginal plates on each side of the hinge (figs. 7, 9), the ante-penultimate joint produced distally, forming a small finger-like process (fig. 8). Fifth pair of feet of the usual prehensile kind, but rather slender (fig. 10), that of the right side ending in a feebly developed, but strongly clawed, hand; that of the left side in a simple bluntly furcate extremity.

Only two examples of this species were seen, both of them males. It is named after Mr. Chubb, the Curator of the Durban Museum, to whom I am chiefly indebted for the opportunity of examining and reporting upon these interesting plankton collections.

GENUS PONTELLOPSIS, Brady.

Pontellopsis speciosus, sp. nov. Plate X, figs. 1-8.

Female. Body robust, rostrum short and slender, bifurcate (fig. 1); two small dorsal lenses behind the rostrum; metasome narrowed at posterior extremity, with sharp, backwardly produced angles (fig. 8); abdomen short, two-segmented, inner margins of the last segments bulbously produced; caudal laminæ scarcely twice as long as broad. Anterior antennæ seventeen-jointed, quite as long as the entire body of the animal, bearing several long plumose setæ and at every joint one or more shorter hairs; posterior antennæ, swimming feet and mouth organs as in Pontella (figs. 2-6); fifth pair of feet (fig. 7) simple, consisting of a basal joint with two slender, uni-articulate, terminal branches, bearing apical setæ. Length 1.6 mm.

Male unknown.

The genus *Pontellopsis* is referred by Giesbrecht to a rather heterogeneous group *Monops*. It differs remarkably from *Pontella* and *Labidocera* in the structure of the swimming feet, ocular lenses, etc., but as the males remain unknown, the position of the genus must for the present be regarded as merely provisional.

GENUS PONTELLA, Dana.

PONTELLA NATALIS, sp. nov. Plate XII, figs. 6-14.

Female. Length 3 mm. Head with lateral hooks (fig. 7). Abdomen short, two-jointed; caudal lamine broad, divergent, bearing five short, stout plumose setæ, the central one wider and lancet-shaped (fig. 8). Antennules twenty-four-jointed, reaching to the third thoracic segment of the body. Fifth foot of female biramose (fig. 9), the exopodite two-jointed, bearing three short terminal spines; endopodite short, simple, consisting of one joint, furcate at the apex.

The male is equal in size to the female, the antennule of the right side much swollen in the middle, the penultimate and ante-penultimate

joints marginally serrated (fig. 11). Abdomen four-jointed (fig. 10), caudal lamine more than twice as long as broad, with five slender, plumose setæ, the second of which is very much longer than the rest; swimming feet normal, the endopodites bi articulate, except those of the first pair which have three joints; foot of the fifth pair (fig. 12) on the right side strongly prehensile, doubly geniculate, the inner margin of the ante-penultimate joint produced into three triangular spines; foot of the left side slender, elongated, its terminal joint slightly setiferous. The head bears two dorsal optical lenses, and usually one much larger lens in the rostrum (fig. 13); one of the dorsal lenses is sometimes much enlarged owing to the development of a subglobular pigment body behind it (fig. 14).

Several examples of this species were observed. Though a great number of Pontellæ have heen described by various authors, this appears not to be referable to any of them, the chief distinctive characters being those of the tail and the fifth pair of feet.

APHELURA TYPICA, Brady.

In describing this species (Annals of the Durban Museum, Vol. I, Part 1, p. 26), I expressed a doubt whether it might not eventually be found to be merely a larval stage of some other Copepod, and this doubt is strengthened by the study of further specimens. I suspect that it may probably be a transitional stage of *Pontella natalis* here described.

GENUS ISOCOPE, gen. nov.

Differs from other Pontellidæ chiefly in the structure of the swimming feet and posterior antennæ. The first four pairs of feet have the endopodites and exopodites uniformly three-jointed, the two rami of the posterior antennæ are of nearly equal length, the outer ramus consisting of three joints, the inner of two.

ISOCOPE PROPINQUA, sp. nov. Plate X, figs. 9-11. Plate XI, figs. 9-13.

Male. Anterior antennæ twenty-four-jointed, slender, only slightly dilated, the hinge joints finely pectinated (Plate X, figs. 9 and 10); abdomen four-jointed (Plate XI, fig. 13), caudal segments elongated, narrow, equal in length to the abdomen itself; endopodites of the

first four feet short, three-jointed; last joint of the exopodites elongated, equal to the two preceding joints; fifth pair prehensile, that of the right side armed with two slender falcate claws; terminal joint of the left side sub-ovate, expanded and bearing two long curved setæ (Plate X, fig. 11).

Female unknown.

GENUS OITHONA, Baird.

OITHONA ERYTHROPS, sp. nov. Plate XII, figs. 1-5.

Female. Length 1·1 mm. Body elongated, slender (fig. 1); antennules when reflexed reaching beyond the middle of the abdomen, indistinctly jointed, setæ very long, not plumose; exopodites of the first pair of feet with short marginal lancet-shaped, plumose spines (fig. 4); fifth pair represented by a minute papilla with a single apical seta (fig. 1b); last joint of the abdomen rather deeply emarginate and bearing at the distal extremity two short setæ (fig. 5); caudal laminæ closely appressed. Head with a short frontal spine, and near the bases of the foot-jaws having a ruby-red group of ocular lenses (figs. 1a and 2).

Among the many described species of Oithona I can find none which quite agrees with this. The most nearly allied is apparently O. plumifera, Dana, which differs, however, in some important characters, as in the antennal setæ, the fifth pair of feet, the abdomen and caudal laminæ. And in no other species has an eye-spot been noticed, so far as I am aware.

GENUS OITHONOPSIS, gen. nov.

Metasome elongated, slender; urosome much narrower than metasome, two-segmented; anterior antennæ long and slender, bearing numerous long setæ, posterior antennæ two-branched, secondary branch small, consisting of a single short setiferous joint; mandible of the usual type, palp with a large basal, and two small one-jointed branches; maxillæ and first pair of maxillipeds of the usual type, but rather feebly developed; posterior maxillipeds minute, the terminal portion very short and slender, two-jointed, with a small apical claw; endopodites of the four pairs of feet two-jointed, exopodites three-jointed; fifth pair rudimentary, papilliform, with two unequal apical setæ.

This, though very similar in appearance to the genus Oithona differs remarkably in its short abdomen, and in the abnormal characters of the posterior antenna and mouth organs, while in the jointing of the first four pairs of feet it agrees with Paroithona, Farran,* of which two species have been described by that author.

OITHONOPSIS FARRANI, sp. nov. Plate XI, figs. 1-8.

Female. Metasome elongated, obtusely rounded in front, truncated behind, thrice as long as the two-jointed abdomen, including the caudal laminæ, which are equal in length to the preceding abdominal segment; anterior antennæ as long as the entire animal; mandible of the usual type (fig. 3), palp consisting of a stout basal segment with two small uni-articulate branches; posterior foot-jaw (fig. 6) very small, its distal portion forming a slender bi-articulate limb with a terminal minutely serrated claw; endopodies of the first four feet two-jointed, the proximal joint twice as long as the distal one: fifth foot rudimentary (fig. 8). Length 1.2 mm.

Male unknown.

Only three or four specimens were seen, but owing to its small size and great transparency others probably escaped observation. I have pleasure in naming the species after Dr. Farran, whose valuable researches in marine zoology are well-known.

GENUS PELTIDIUM, Philippi.

Peltidium cinereum, sp. nov. Plate XIV, figs. 1-9.

Female. Length 1 mm. Depressed, ovate; seen dorsally widest in front, nearly twice as long as broad (fig. 1). Antennules short and stout, seven-jointed (fig. 2), bearing numerous setæ, and on the penultimate joint a stout sensory filament; antennæ (fig. 3) bearing at the distal end three very long and slender bi-articulate claws; secondary branch (endopodite) slender, bi-articulate; mouth organs of the usual type, hand of the posterior foot-jaw narrow, and bearing a long, slender claw (fig. 6). Inner branch of the first pair of feet bi-articulate, broadly foliaceous, and bordered by a wider pellucid flange, its oblique distal end bearing two or three apical setæ and two

^{*} Second Report on the Copepoda of the Irish Atlantic Slope, by G. P. Farran, B.A., p. 89.

short, club-shaped, marginal rods; outer branch (exopodite) elongated, slender, three-jointed, the distal joint bearing a long apical claw (fig. 7), second, third and fourth pairs of feet of the usual type, both branches three-jointed; fifth pair (fig. 8) very small bi-articulate, the distal joint bearing four spine-like setæ, the basal joint only two. The genital segment of the abdomen is very wide, its lateral angles produced backwards nearly as far as the extremities of the caudal lamelle; the arcolæ, marked off as usual by chitinous bands, being very conspicuous (fig. 9).

Ten or eleven specimens of this interesting species were noticed, the colour an inconspicuous ashy grey—whence the proposed specific name. Of the mandibles I was unable to obtain a quite satisfactory view, the figure being apparently distorted. No males were seen.

Peltidium rubrum, sp. nov. Plate XIII, figs. 1-13.

Female. Body tumid, depressed, abruptly truncated posteriorly, produced anteriorly into a broadly prominent rostrum (fig. 2); anterior antennæ (fig. 5) short and stout, six- (or seven-?) jointed, densely clothed with long hairs and bearing a very stout, long, sensory seta, the three proximal joints much larger than the following very short apical joints. Posterior antennæ shorter and more robust than in P. cinereum (fig. 6). Biting edge of the mandible very broad, with numerous strongly developed teeth. Maxillipeds stout and well developed, hand of the posterior pair broad, its inner edge fringed with a series of stunted chitinous teeth (fig. 9). First pair of feet (fig. 11) similar to those of the preceding species, but with much shorter terminal claws and devoid of pellucid marginal flanges. Fifth pair (fig. 13) uni-articulate, foliaceous, sub-quadrate, with several rather strong terminal and marginal setæ. Caudal laminæ protected by the overlapping abdominal segments (fig. 4), and bearing two unequal apical setæ. Length 1.05 mm.

Only two specimens of this species were seen, ξ and φ in coitu as represented in fig. 3. The male was unfortunately lost in the process of dissection, and I can give no account of it further than is represented in figs. 1 and 10. The structures of the male are very strongly chitinous and the whole animal is coloured a deep ruby red: the female, on the contrary, is almost colourless. In addition to the very vivid coloration my attention was drawn to it by the villous covering, roughly given in my drawing (fig. 3), which seemed to overspread the whole body of the animal.

GENUS CORYCÆUS, Dana.

? CORYCEUS GRACILICAUDATUS, Giesbr. Plate XIV, figs. 10-12.

Corycœus gracilicaudatus, Giesbrecht. Pelagische Copepodea von Nepel, 1892.

Corycaus gracilicaudatus, Farran. Plankton from Christmas Island (Proc. Zool. Soc. London, 1911, p. 290, Pl. XI, figs. 11 & 12).

?Corycœus erythræus, Cleve. Report on Plankton collected by Mr. Thorold Wulff (Arkiv. för Zoologi, Band I, 1903, p. 376, Taf. 18, figs. 7 and 8).

Several specimens which seem to agree with the descriptions and figures above noticed were found in the gatherings from Durban Bay. Dr. Farran's specimens occurred in gatherings from the "Red Sea, Arabian Sea, Indian Ocean and Tropical Pacific." The habitat of Cleve's specimens is not given. Giesbrecht's species may perhaps be identical with Dana's C. agilis.

EXPLANATION OF PLATES IX-XIV,

Illustrating Dr. G. S. Brady's paper "Notes on Pelagic Entomostraca of Durban Bay,"

PLATE IX.

Metranura typica, 9.

Fig. 1.—x 84.	Posterior antenna,
Fig. 2.—x 84.	Mandible and palp.
Fig. 3.—x 50.	Abdomen seen dorsally.
Fig. 4.—x 240.	Caudal stylet with ovarian capsule and duct.
Fig. 5.—x 84.	Foot of second pair.
Fig. 6x 84.	Foot of fourth pair.

Labidocera chubbi, 8.

Fig. 7.—x 84.	Right anterior antenna.				
Fig. 8.—x 240.	Process of antenenultimate joint of same.				
Fig. 9.—x 240.	Pectinated joint of same,				
Fig. 10x 100.	Fifth pair of feet.				
	Abdomen and furca.				
Fig. 12.—x 60.	Last thoracic segment and abdomen.				
Fig. 13.—x 84.	Rostrum and dorsal lenses.				
Fig. 14.—x 40.	Penilia schmackeri,				

PLATE X.

Pontellopsis speciosus, Q.

Fig. 1.—x 40.	Animal seen dorsally.
Fig. 2.—x 40.	Posterior antenna.
Fig. 3.—x 84.	Maxilla.
Fig. 4.—x 84.	Posterior maxilliped.
Fig. 5.—x 84.	Foot of first pair.
Fig. 6.—x 84.	Foot of fourth pair.
Fig. 7.—x 140.	Foot of fifth pair.
Fig. 8.—x 84.	Abdomen and first thoracic segment,

Isocope propingua, 8.

Fig. 9.—x 84.	Hinge portion of anterior antenna.
Fig. 10.—x 240.	Pectinated joints of the same.
Fig. 11.—x 55.	Fifth pair of feet.

PLATE XI.

Oithonopsis farrani, Q.

Fig. 1.—x 84.	Animal seen dorsally.
Fig. 2.—x 240.	Posterior antenna.
Fig. 3.—x 240.	Mandible and palp.
Fig. 4.—x 240.	Maxilla,
Fig. 5.—x 240.	Anterior maxilliped.
Fig. 6.—x 240.	Posterior maxilliped.
Fig. 7.—x 240.	Foot of second pair.
Fig. 8.—x 84.	Foot of fifth pair.

Isocope propinqua, &.

Fig. 9 x 84.	Posterior antenna.
Fig. 10.—x 84.	Mandible and palp.
Fig. 11.—x 84.	Foot of first pair.
Fig. 12.—x 84.	Foot of fourth pair,
Fig. 13.—x 84,	Abdomen and furca

PLATE XII.

Oithona erythrops, Q.

Fig. 1.—x 65.	Female seen dorsally.	(a) eye-spot.
Fig. 2x 240.	Eve-spot.	

Fig. 3.-x 240. Mandible palp.

Fig. 4. -x 240. Exopodite of first pair of feet.

Fig. 5.-x 240. Furca.

Pontella natalis.

Fig.	6x	25.	Female	seen	from	left	side.

Fig. 7.-x 40. Head with side hooks.

Fig. 8.-x 65. Caudal laminæ and setæ of female.

Fig. 9. -x 140. Fifth foot of female.

Fig. 10.-x 40. Abdomen of male.

Fig. 11.-x 65. Distal portion of antennule of male.

Fig. 12.-x 84. Fifth pair of feet of male.

Fig. 13.-x 40. Dorsal and rostral lenses.

Fig. 14. -x 100. Dorsal lens with pigment body.

PLATE XIII.

Peltidium rubrum.

- Fig. 1.-x 40. Male seen dorsally.
- Fig. 2.—x 40. Female seen from right side.
- Fig. 3.-x 40. Male and female in coitu.
- Fig. 4.-x 84. Posterior segment of metasome and tail.
- Fig. 5.-x 240. Anterior antenna of female.
- Fig. 6.-x 140. Posterior antenna.
- Fig. 7.-x 240. Mandible and palp.
- Fig. 8.-x 240. Anterior maxilliped.
- Fig. 9.-x 110. Posterior maxilliped.
- Fig. 10.-x 140. Foot of first pair, male.
- Fig. 11.-x 140. Foot of first pair, female.
- Fig. 12.-x 140. Foot of second pair, female.
- Fig. 13.-x 240. Foot of fifth pair, female,

PLATE XIV.

Peltidium cinereum, 9.

Fig. 1.-x 40. Female seen dorsally.

Fig. 2.-x 240. Antennule.

Fig. 3.-x 200. Antenna.

Fig. 4.-x 240. Mandible and palp.

Fig. 5.-x 240. Anterior foot-jaw.

Fig. 6.-x 84. Posterior foot-jaw.

Fig. 7.-x 240. Foot of first pair.

Fig. 8.-x 240. Foot of fifth pair.

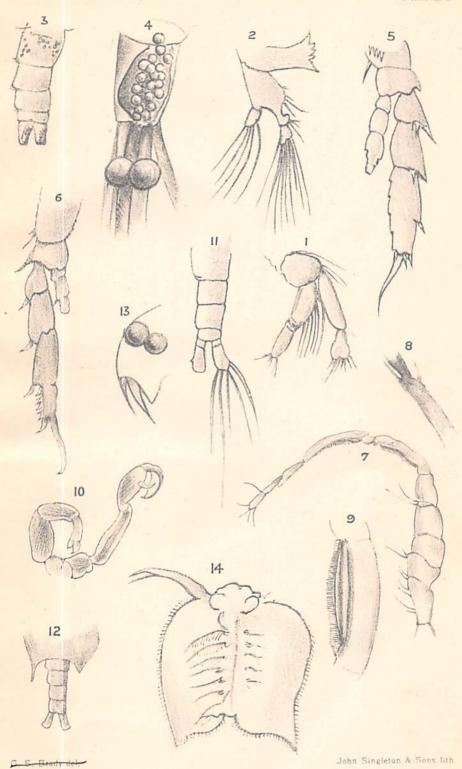
Fig. 9.—x 84. Posterior segments and tail.

Corycaus gracilicaudatus.

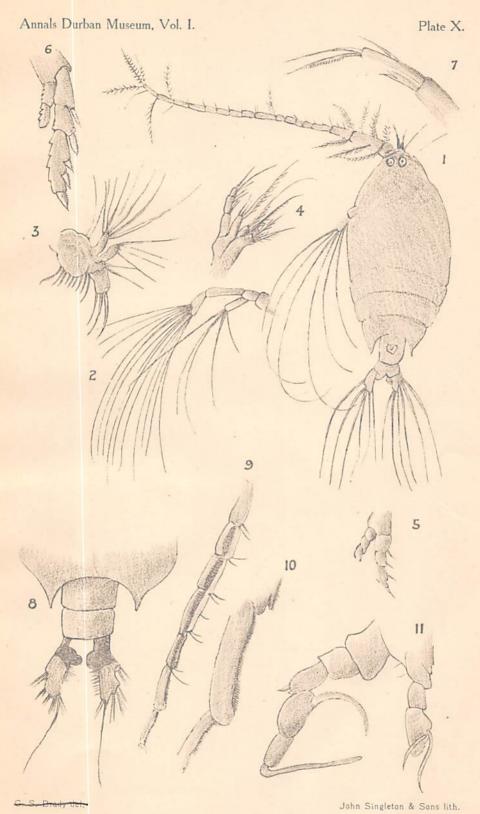
Fig. 10.-x 84. Female.

Fig. 11.-x 240. Posterior foot-jaw.

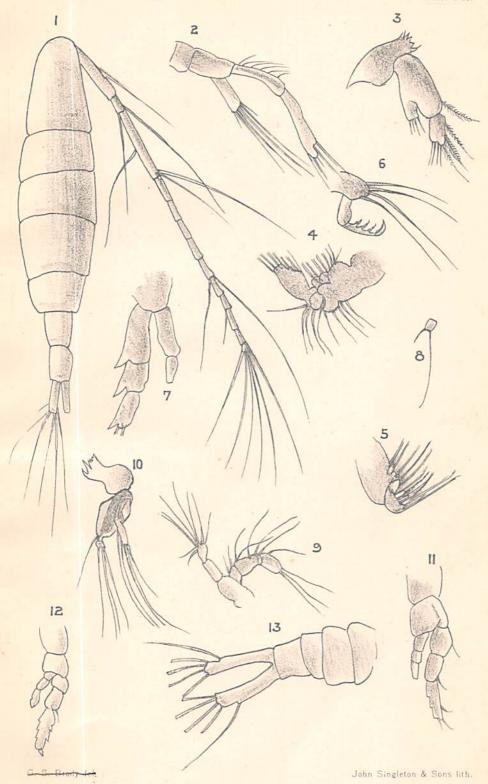
Fig. 12.-x 240. One of the swimming feet.



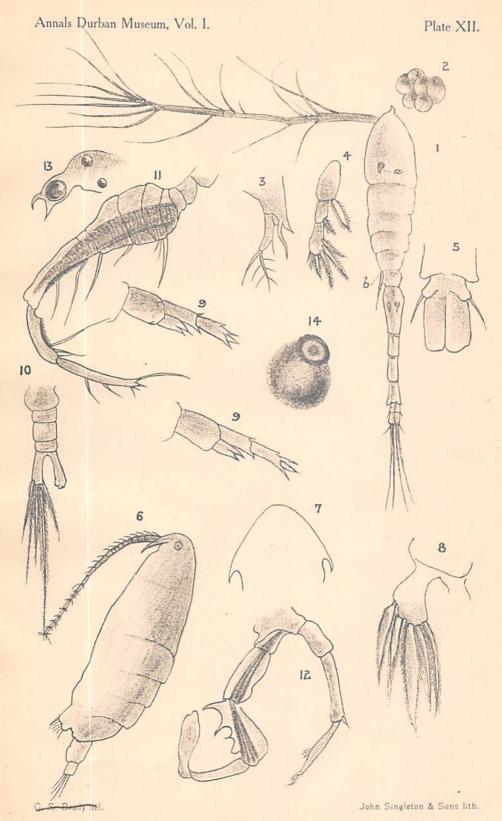
1–6 METRANURA TYPICA (♀). 7–13 LABIDOCERA CHUBBI (♂). 14 PENILIA SCHMACKERI.



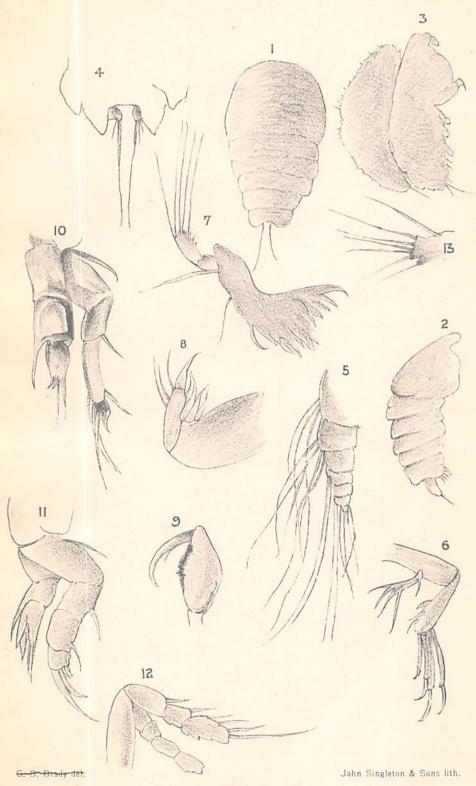
1-8 PONTELLOPSIS SPECIOSUS (Q). 9-11 ISOCOPE PROPINQUA (δ).



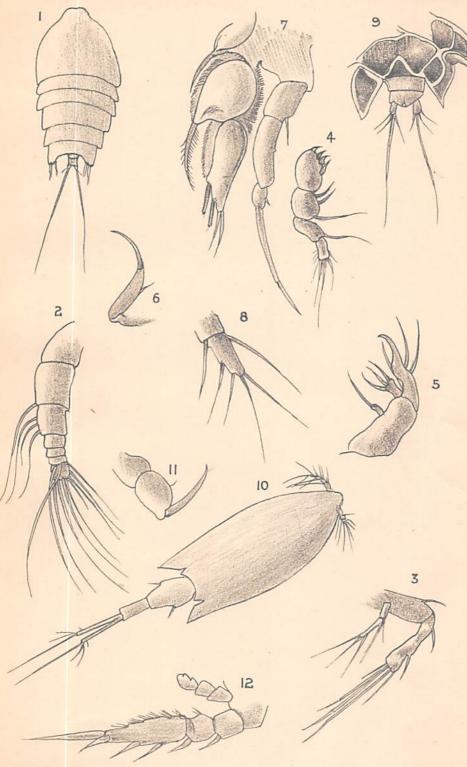
1-8 OITHONOPSIS FARRANI (Q.). 9-13 ISOCOPE PROPINQUA (&).



1-5 OITHONA ERYTHROPS (♀). 6-14 PONTELLA NATALIS.



PELTIDIUM RUBRUM.



G. S. Brady del.

John Singleton & Sons lith.

D. & Branch William with the author's compto

Notes on Pelagic Entomostraca of Durban Bay.

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COLLECTION