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CRUSTACEA.

V.—OSTRACODA.

BY G. STEWARDSON BRADY, M.D., LL.D., D.Sc., F.R.S.

(3 Plates.)

IN the fifty-seven gatherings submitted to me there occurred only nine species of *Ostracoda*. Of these all except two appear to be hitherto undescribed. The paucity of species is accounted for by the fact that the nettings were made on a very limited number of small areas, many of them practically identical one with another, and differing only as to their various dates. The list of species is as follows :—

- Conchæcia innominata*, sp. n.
- Paraconchæcia gracilis*, Claus.
- Pseudoconchæcia serrulata*, Claus, var. *levis*, var. nov.
- Cypridina glacialis*, sp. n.
- Philomedes orbicularis*, sp. n.
- Philomedes assimilis*, sp. n.
- Philomedes antarctica*, sp. n.
- Xestoleberis reniformis*, sp. n.
- Linocheles vagans*, g. and sp. n.

MYODOCOPA.

CONCHÆCIA INNOMINATA.

(Plate II., figs. 7–14.)

Shell of the male (fig. 7) seen from the side, subquadrangular, height equal to about half the length and nearly equal throughout; rostral prominence acutely pointed, with an underlying sinus of moderate depth; anterior extremity rounded away below, and forming a curve continuous with the ventral margin, posterior abruptly truncated, its lower end boldly rounded off; dorsal margin nearly straight or only very slightly sinuous, obtusely angular at the posterior extremity, ventral rather boldly and evenly arcuate throughout its whole length.

The capitulum of the frontal tentacle (figs. 8 and 9) is club-shaped, acutely pointed and slightly hooked at the apex, and in the *male* bulbously dilated at the base, its inner margin more or less setose; stem of the antennule in the male (fig. 8) dilated,

almost pyriform; the proximal long seta armed along its middle third with a double series of about twenty-five short, sharp prickles (fig. 8); in the female these are replaced by fine simple hairs (fig. 9). The secondary branch of the male antenna (fig. 11) bears a large terminal hook, the base of which is sharply bent at a right angle, and there is the usual fascicle of five long setæ; in the female (fig. 10) the secondary branch has a simple terminal joint which bears four setæ of unequal length. Spines of the caudal laminae slender and simple (fig. 14). The shell appears simply granular in structure until after removal of the delicate lining membrane, when it is seen to be very closely and finely striated in a curvilinear fashion; there is a conspicuous group of gland-cells at the postero-ventral angle of the shell, and smaller gland-cells are continued in single file round the entire margin.

This species occurred plentifully in almost all the nettings taken in Winter Quarters. It was, indeed, by far the most abundant of all the *Ostracoda* taken during the Expedition. It has many points of resemblance to *Paraconchæcia inermis*, Claus, but cannot be identified with that species.

PARACONCHÆCIA GRACILIS.

- Paraconchæcia gracilis*, Claus. Die Gattungen und Arten der Mediterranen und Atlantischen Halocypriden, p. 15.
Paraconchæcia gracilis, Claus. Die Halocypriden des Atlantischen Oceans und Mittelmeeres, p. 66, Pl. xii.

In a surface gathering from lat. 49° 40' S., long. 172° 18' 30" E. were found a few examples of this species. Claus saw only two specimens, a male and a female, in material taken from a depth of 1500 metres in lat. 37° 45' N., long. 13° 38' W.

PSEUDOCONCHÆCIA SERRULATA, var. *lævis*.

1874. *Conchæcia serrulata*, Claus. Die Familie der Halocypriden, p. 61, Pl. 1, figs. 2-7, 9-11, Pl. ii, figs. 12, 13, 17, 19.
 1880. *Halocypris atlantica*, Brady. Report on the Ostracoda of the 'Challenger' Expedition, p. 164, Pl. xi., figs. 1-15, Pl. xii., figs. 11, 12.
 1890. *Pseudoconchæcia serrulata*, Claus. Die Gattungen und Arten der Mediterranen und Atlantischen Halocypriden, p. 20.
 1891. *Pseudoconchæcia serrulata*, Claus. Die Halocypriden des Atlantischen Oceans und Mittelmeeres, p. 72, Pl. xix., figs. 1-14, Pl. xxiii., figs. 1-13.
 1895. *Pseudoconchæcia serrulata*, Brady. A supplementary report on the Crustaceans of the Group Mydocopa obtained during the 'Challenger' Expedition (Trans. Zool. Soc., London, Vol. XIV., Part iii., 1897), p. 96, Pl. xvii., figs. 22-24.

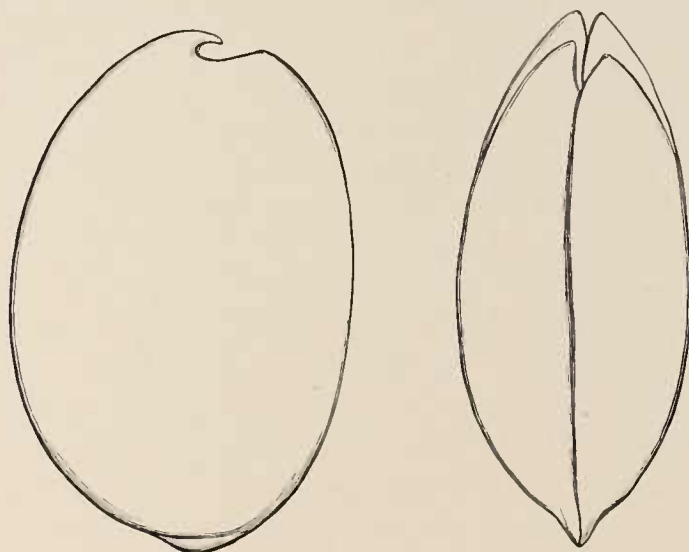
This is a widely distributed species, both in the Atlantic and Pacific Oceans (Claus). It occurred plentifully in many of the Plankton collections made during the voyage of the 'Challenger,' but I do not find any distinct record of its occurrence in higher latitudes than 35° 41' N. and 56° 54' S. It was found in very few of the

'Discovery' nettings, but in one of these it was plentiful—lat. $56^{\circ} 54'$ S., long. $170^{\circ} 28'$ E. The other stations in which it occurred less abundantly are lat. $49^{\circ} 40'$ S. long. $172^{\circ} 18' 30''$ E. (surface); lat. $59^{\circ} 19'$ S., long. $120^{\circ} 24' 30''$ E. (five fathoms); lat. $58^{\circ} 49' 45''$ S., long. $154^{\circ} 48'$ W. (five fathoms); and in Winter Quarters, No. 8 hole (ten fathoms).

The 'Discovery' specimens differed in all cases from the type in being almost destitute of colour and striation of the shell, and in the absence of marginal serrulations, which are usually very distinct. But, apart from these peculiarities, I cannot find any characters to distinguish them from the type. I propose to give them the varietal name *lævis*.

CYPRIDINA GLACIALIS.

Shell, seen laterally, ovate, greatest height situated in the middle and equal to about two-thirds of the length; anterior extremity rounded off, beak short and acutely



CYPRIDINA GLACIALIS.

pointed, not at all prominent, subjacent sinus small and shallow, posterior extremity slightly produced below the middle; dorsal margin boldly and evenly arcuate, ventral much flattened; seen from above the outline is elongated, ovate, more than twice as long as broad, widest in the middle, tapering gradually toward the anterior extremity, which is subacute, posterior extremity produced and mucronate. Substance of the shell thin but calcareous, surface smooth, destitute of markings or sculpture, colour yellowish. Length, 5 mm.

One specimen only—a female—was seen in a netting consisting mainly of *Philomedes assimilis*. Winter Quarters, 11th Nov., 1902; Hut Point. Its nearest allies seem to be *Cypridina gracilis*, Brady, and, perhaps, *C. luteola*, Dana, with neither of which, however, can it be certainly identified.

PHILOMEDES ORBICULARIS.

(Plate I., figs. 1-15.)

Shell of the *female* seen from the side almost circular, except in the region of the sinus at the ventral margin, length about one-fourth greater than the height (fig. 1); anterior extremity obtusely angulated above the rostrum, posterior broadly and evenly rounded, dorsal margin rather boldly arched throughout its whole length, ventral strongly arched from the deep subrostral sinus backwards. Seen from above (fig. 2) the outline is broadly ovate, rounded behind and submucronate in front, greatest width situated in the middle and equal to about two-thirds of the length. Surface of the shell smooth and densely clothed with a villous coating of very short hairs; margins of the rostrum and subjacent sinus fringed with stiff setæ (fig. 6). Shell of the *male* (fig. 3) somewhat elongated, height not greatly exceeding one-half of the length, rostrum and sinus less developed than in the female; posterior extremity obliquely subtruncate, slightly sinuated in the middle and rounded off ventrally; dorsal margin well arched, ventral forming a continuous flattened curve. In the young condition (figs. 4, 5), the shell of the *female* in lateral view has the postero ventral angle sharply produced and is mucronate when seen dorsally. The soft parts of the animal have the typical characters of the genus, but the antennal setæ (fig. 8) form two distinct series, the distal set being about twice as long as the proximal; the secondary branch of the female antenna (fig. 9) is two-jointed, the basal joint bearing a few short marginal setæ, the second joint four marginal setæ, one of which is longer than the rest and plumose, also a single lash-like apical seta. The secondary branch of the *male* antenna (fig. 10) is much like that of *P. brenda*, but less robust and its marginal setæ are shorter. The principal tooth of the second maxilla (figs. 12, 13) is very large and strong, somewhat hatchet-shaped, the two extremities produced into strong cutting lobes, with a third smaller lateral tooth—the appearance of the whole organ, however, varying very much according to the position in which it is seen. The other limbs present no features calling for special remark. Length, 2.5 mm.

P. orbicularis was found only in two gatherings (May 23, 1902 and June 15, 1902). It is in all respects very similar to the well-known European species *P. brenda* and may perhaps be fairly looked upon as a southern variation of that form. There is the same characteristic villous covering and the size is nearly the same, but there is a total absence, in the adult, of any posterior angulations of the shell, which is also considerably more tumid than that of the northern species. The rather well marked constriction of the anterior, and the broadly rounded character of the posterior extremity, when seen dorsally, are also noteworthy features. The form of the shell in *P. brenda* seems to be the same throughout life: at any rate the smallest specimens I have seen present characters exactly the same as those

of the adult. But one or two small specimens which occurred along with *P. orbicularis*, and which I at first took to be the young of that species, were very distinctly angulated posteriorly, and I now think that they belong probably to the following species *P. assimilis*, especially as they have not the villous covering of *P. orbicularis*.

PHILOMEDES ASSIMILIS.

(Plate I., figs. 16-21. Plate II., figs. 1-6.)

Shell of the *female* seen from the side (Plate II., fig. 1) oblong, subcircular, height equal to two-thirds of the length, anterior extremity sharply angulated below at its junction with the wide truncated rostrum, posterior sloping steeply and forming a somewhat rounded, prominent angle at its ventral end; dorsal margin strongly arched, highest in the middle, ventral evenly but less strongly convex, terminating in front in a deep subrostral sinus and behind in an obtusely angular process. Seen from above (fig. 2) the outline is oblong, ovate, twice as long as broad, greatest width situated in the middle, anterior extremity obtusely pointed, posterior produced and mucronate, lateral margins evenly arcuate. The shell of the *male* (fig. 3) much longer in proportion to the height, rostrum and subrostral sinus much less pronounced, posterior extremity more narrowed and having a larger and more rounded ventral prominence; the squamous, marginal laminae of the rostrum are marked with numerous hair-like striæ and are closely punctated (fig. 4). The limbs and appendages do not present any special specific characters, but the hairs at the base of the claws of the post-abdomen of the male are more than usually conspicuous (fig. 5). Length of the female, 1.8mm.

The stations at which *P. assimilis* was taken were all in Winter Quarters:—

September 30, 1903.—No. 12 hole, D. net 246.

Hut Point.—September 13, 1902, D. net.

Hut Point.—February 13, 1904, D. net 264.

10 Fathoms, March 19, 1902.

November 28, 1902, D. net.

May 23, 1902, and February 13, 1904.

12 Hole, D. net, September 8, 1903.

PHILOMEDES ANTARCTICA.

(Plate III., figs. 1-10.)

Shell of the *female* seen from the side, broadly subovate (fig. 2), with a prominent beak, a deep subrostral sinus, and an obtusely prominent postero-ventral angle, greatest height situated in the middle, and equal to about two-thirds of the length; anterior extremity rather narrower than the posterior, sloping steeply from the dorsum to form the angularly prominent beak; posterior subtruncate, slightly sinuated, rounded off dorsally, but terminated ventrally by a rounded, backwardly produced prominence;

dorsal margin boldly and evenly rounded, ventral evenly convex but not so fully arched as the dorsal margin. Seen from above (fig. 3) the outline is ovate, scarcely twice as long as broad, widest in the middle, rounded off in front, strongly mucronate behind. The ventral border of the rostrum is produced into a thin lamina which is partly overlaid by long closely-set hairs, and the posterior border of the subrostral sinus is similarly fringed (fig. 4). Shell-surface closely and very finely punctated throughout, smooth, except on the ventral aspect, where it bears numerous scattered hairs. Just behind the rostral sinus there is a small patch of eleven or twelve subparallel striæ, and a short series of stiff hairs just within the ventral margin: a large black eye-spot just within the dorsal border at its anterior third.

The shell of the *male* (fig. 1) is larger and more elongated than that of the female, nearly twice as long as broad, with a less pronounced rostral sinus and a much narrower and more produced posterior extremity, the eye-spot small and situated near the centre.

Length of the male, 2·3 mm. ; of the female, 1·7 mm.

The setæ of the terminal fascicle of the antennule in the female are very short—not more than half the length of the limb; the second (or third?) seta of the antennæ is spinulose (fig. 8) in the female, the remaining setæ are simply ringed: the secondary branch of the antenna (fig. 6) is of the usual form, but has an indistinctly jointed appearance at the apex. Principal tooth of the second maxilla (female) (fig. 9) sharp and broadly triangular; unguis of the caudal lamina (fig. 10) rather strongly pectinate in the female—but only faintly ciliated in the male. The eyes of the male (fig. 5) are pyriform, and deeply pigmented, the frontal tentacle rigid, dilated, and slightly pigmented at the base. Secondary branch of the antenna of the male large and strongly prehensile (fig. 7), the last joint bulbously dilated at the apex, basal joint bearing a strongly uncinatè process. *P. antarctica* was found rather sparingly in four of the gatherings taken at “No. 4 hole” in a depth of five fathoms.

The shell was in all cases of a thin, membranaceous character, but I suspect that this may have arisen from the solvent action of the formalin preservative on the mineral matter.

PODOCOPA.

XESTOLEBERIS RENIFORMIS.

(Plate I., figs. 4, 5.)

Shell of the *male* seen from the side (fig. 4) subreniform, much narrower in front than behind, greatest height situated behind the middle and equal to half the length; anterior extremity well rounded, narrow, posterior much wider, not very fully rounded, dorsal margin forming a continuous arch, highest behind the middle, sloping very gradually backwards and with a rather steep curve towards the front, ventral margin rather deeply sinuated in the middle. Seen from above, the outline is broadly ovate

(fig. 5), pointed in front, broadly rounded behind, the lateral margins very boldly arcuate, greatest width situated behind the middle and equal to two-thirds of the length. The surface of the shell is smooth, deep ochreous yellow in colour, with a conspicuous dark eye-spot within the dorsal margin near the front, just below and behind which there is a large irregularly shaped pellucid, sub-circular patch, and below this again a series of four oblong muscle spots, arranged in a transverse curve, and in front of these two smaller spots the long diameters of which lie in the opposite direction. The left valve is the larger of the two, overlapping the right both in front and behind. Length 0.65 mm. The shell of the *female* is somewhat more tumid, and seen from the side has no ventral sinuosity; it is also almost free from anterior depression, the two extremities being nearly equal in width.

Two specimens only of this small species were seen, a male and a female; the female, however, was only an empty shell and was quite colourless. The exact locality of the capture I do not know. The specimens were accidentally discovered in a flocculent diatomaceous deposit which settled from the liquid in which the larger Cypridinidæ had been preserved. The flexuous lateral contour of the male distinguishes this from any other species of *Xestoleberis* known to me.

LINOCHELES.*

Differing from the typical Cytheridæ in the greatly elongated and thread-like legs of the third pair, and in the abnormally formed copulatory plate of the male.

LINOCHELES VAGANS.

(Plate III., figs. 11-18.)

Shell closely similar in shape to *Xestoleberis*; seen laterally (fig. 11) that of the male is subreniform, greatest height situated behind the middle and equal to much more than half the length; anterior extremity narrow and obliquely rounded, posterior very wide and evenly rounded, dorsal margin boldly arched, steeply curved posteriorly, sloping with a gentle curve to the front, ventral margin sinuated in front of the middle; seen from above, the outline is elongated, ovate, widest in the middle (fig. 12), width rather less than half the length, narrowed and obtusely pointed in front, broader and rounded off behind. Shell-surface perfectly smooth; colour brown. Length, 0.64 mm.

Antennules six-jointed, very sparingly setiferous (fig. 13); antennæ short and stout, with short apical claws and a stout urticating seta which reaches to the apices of the claws (fig. 14). First and second pairs of legs (figs. 15, 16) armed with short and stout terminal claws; third pair much elongated (fig. 17), the last joint extremely slender and much longer than the united lengths of the two preceding joints; terminal

* *λιον*, a thread; *χηλη*, a claw.

claw very long, thread-like in its tenuity, nearly half as long as the entire limb; external copulative organ (fig. 18) elongated, divided into two portions, the distal part pear-shaped and attached by a narrow neck to the basal region.

Of this curious form only four specimens were found; all of them males. Three specimens from a surface netting in Lat. $49^{\circ} 40' S.$, Long. $172^{\circ} 18' 30' E.$, and one from a netting in five fathoms, Lat. $58^{\circ} 49' 45' S.$, Long. $154^{\circ} 48' W.$ It is difficult to account for the presence at the surface of an animal quite destitute of swimming organs. I am disposed to think that the real habitat is probably among floating weeds, and that the extremely long hinder limb may be useful in giving a grasp of delicate algae or other vegetation.

EXPLANATION OF PLATES.

PLATE I.

PHILOMEDES ORBICULARIS.

- Fig. 1. Shell of female seen from left side $\times 22$.
 .. 2. " " from above $\times 22$.
 .. 3. " male seen from right side $\times 30$.
 .. 6. Beak and sinus of female seen from side $\times 84$.
 .. 7. Extremity of antennule of male $\times 84$.
 .. 8. Antenna of female $\times 50$.
 .. 9. Secondary branch of the same $\times 120$.
 .. 10. " of male $\times 120$.
 .. 11. Mandibular foot of female $\times 100$.
 (a) Process of basal joint $\times 300$.
 .. 12. Principal tooth of second maxilla seen from side $\times 240$.
 .. 13. " " " seen from front $\times 240$.
 .. 14. End of vermiform foot $\times 84$.
 .. 15. Post abdominal lamina $\times 84$.

XESTOLEBERIS RENIFORMIS.

- Fig. 4. Shell of male seen from left side $\times 84$.
 .. 5. " " from above $\times 84$.

PHILOMEDES ASSIMILIS.

- Fig. 16. End of antennule of male $\times 84$.
 .. 17. External branch of the antenna of male $\times 50$.
 .. 18. Antenna of female $\times 84$.
 .. 19. Mandibular foot of female $\times 100$.
 (a) One of the marginal setae more highly magnified.
 Figs. 20, 21. Principal tooth of second maxilla seen laterally and obliquely $\times 240$.

PLATE II.

PHILOMEDES ASSIMILIS.

- Fig. 1. Shell of female seen from left side $\times 40$.
 .. 2. " " seen from above $\times 40$.
 .. 3. " male seen from left side $\times 40$.
 .. 4. Beak and sinus of male $\times 84$.
 .. 5. Post-abdominal lamina of male $\times 84$.
 .. 6. " " female $\times 84$.

CONCHŒCIA INNOMINATA.

- Fig. 7. Shell of male seen from left side $\times 22$.
 .. 8. Antennule and frontal tentacle of male $\times 84$.
 .. 9. " " " female $\times 84$.
 .. 10. Internal branch of antenna of female $\times 84$.
 .. 11. " " " male $\times 84$.
 .. 12. Chewing process of mandible $\times 240$.
 .. 13. Copulatory organ of male $\times 84$.
 .. 14. Post-abdominal lamina $\times 84$.

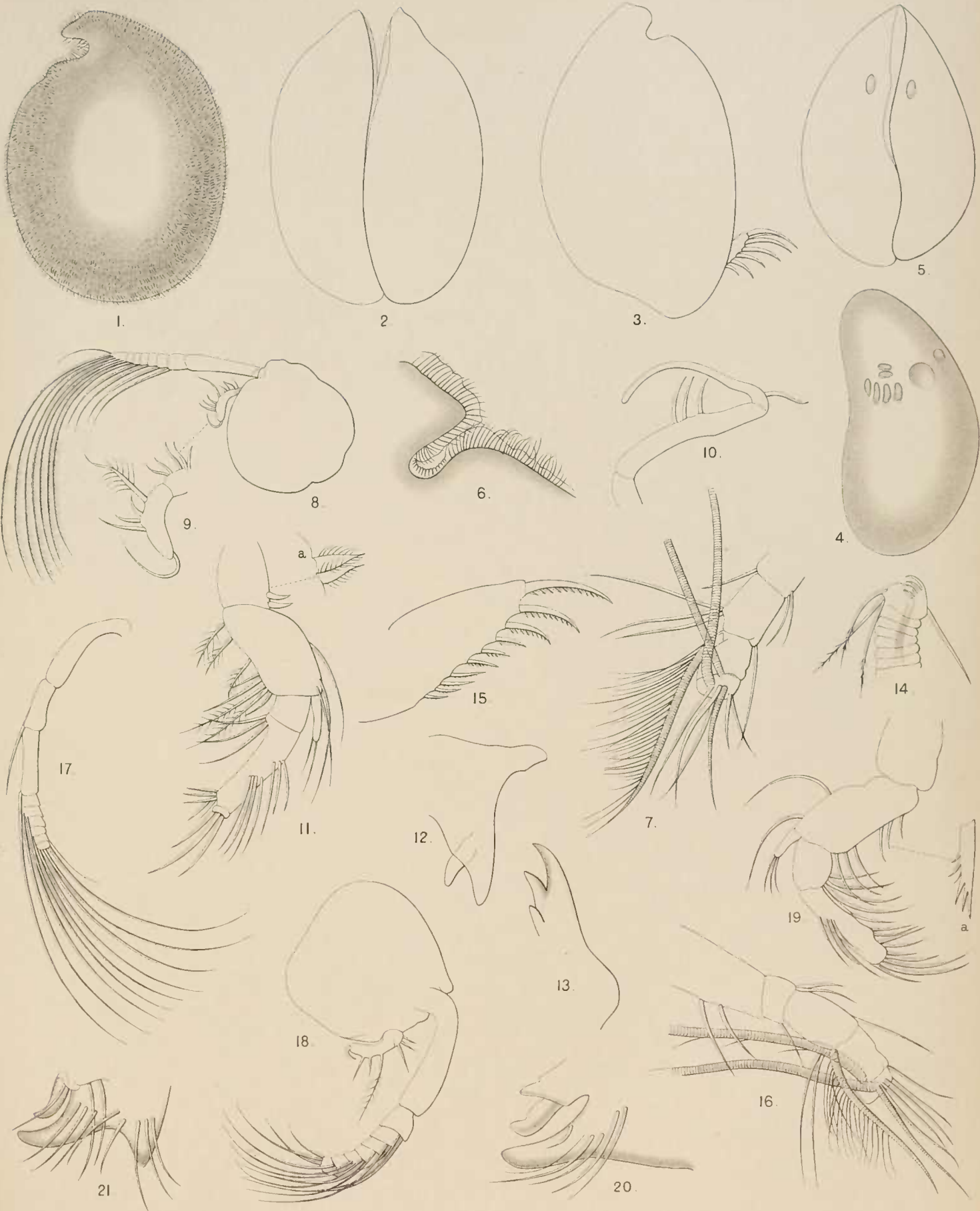
PLATE III.

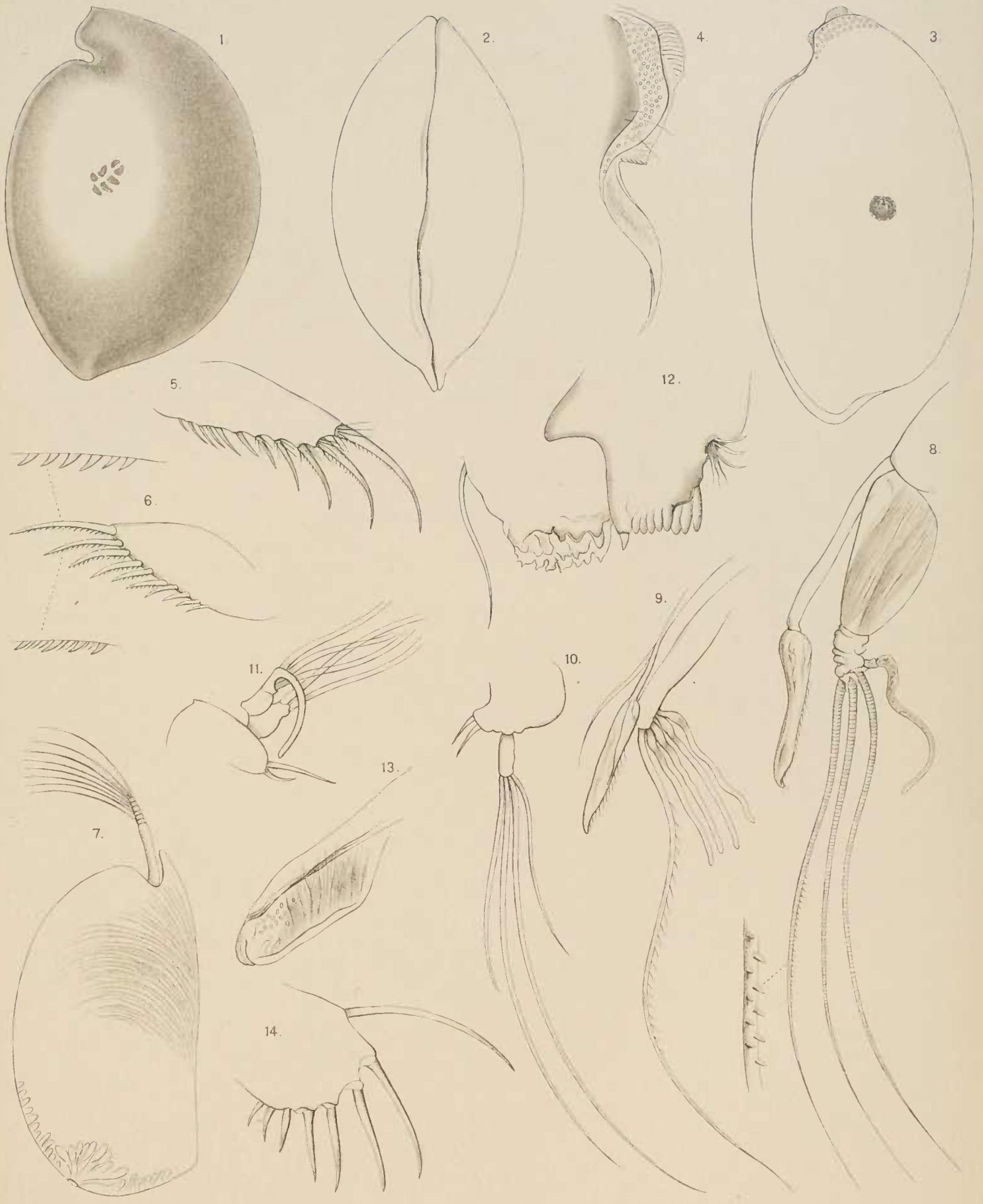
PHILOMEDES ANTARCTICA.

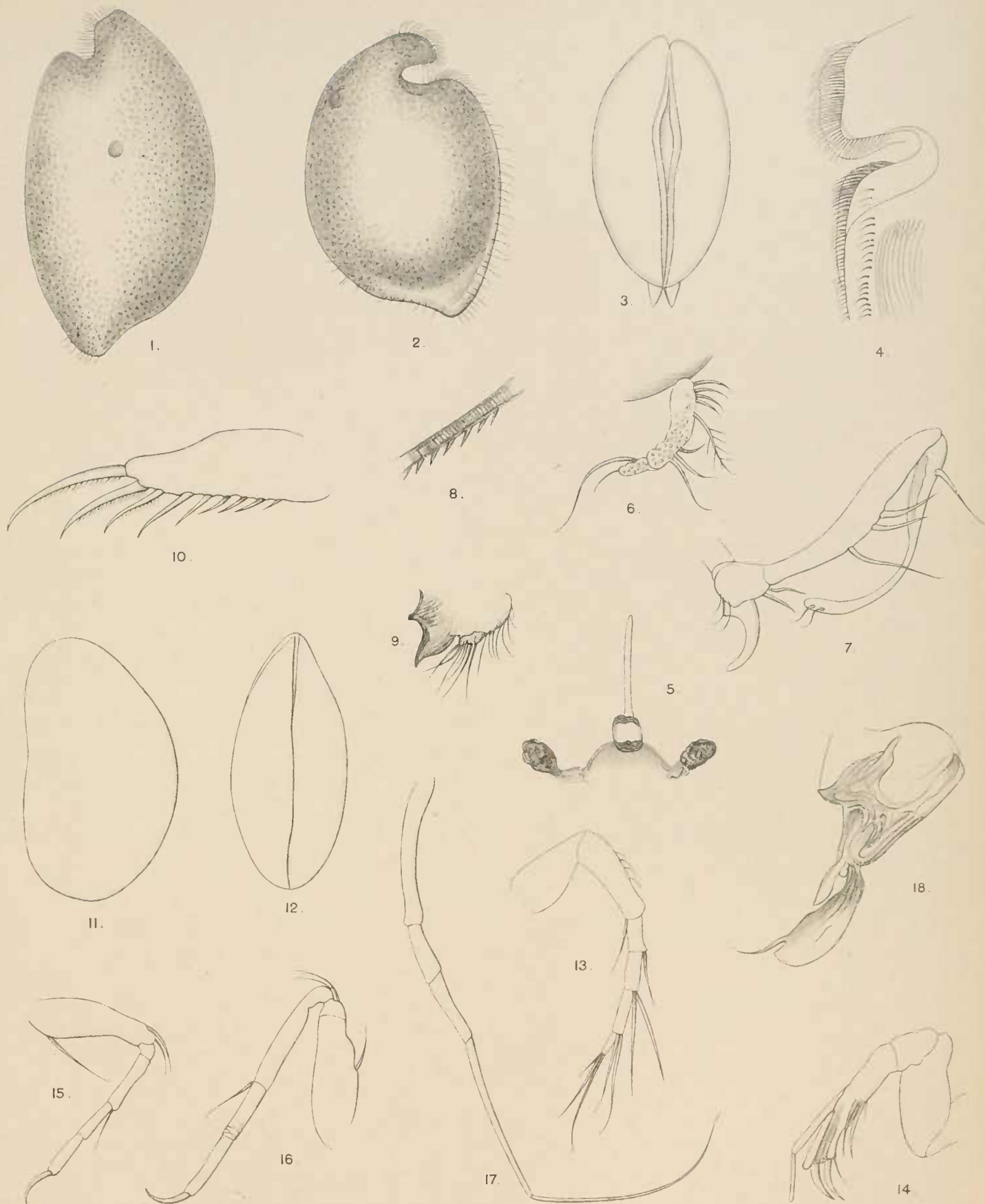
- Fig. 1. Shell of male seen from left side $\times 30$.
 .. 2. " female seen from right side $\times 30$.
 .. 3. " " " above $\times 30$.
 .. 4. Margin of shell of female with subrostral sinus $\times 84$.
 .. 5. Eyes and frontal tentacle of male $\times 55$.
 .. 6. Secondary branch of antenna of female $\times 100$.
 .. 7. " " " male $\times 100$.
 .. 8. Portion of second seta of antenna of female with marginal spines $\times 320$.
 .. 9. Tooth of second maxilla of female $\times 84$.
 .. 10. Caudal lamina of female $\times 84$.

LINOCHÉLES VAGANS ♂.

- Fig. 11. Outline of shell seen from left side $\times 84$.
 .. 12. " " " above $\times 84$.
 .. 13. Antennule $\times 240$.
 .. 14. Antenna (apical joints) $\times 240$.
 .. 15. Foot of first pair $\times 240$.
 .. 16. " second pair $\times 240$.
 .. 17. " third pair $\times 240$.
 .. 18. Copulatory organ $\times 240$.







	Antarctic.	Sub-Antarctic.
<i>Leionymphon clausii</i> , Pfeffer		×
* .. <i>australe</i>	×	
* .. <i>glaciale</i>	×	
* .. <i>spinostum</i>	×	
<i>Ammotheca hoeki</i> , Pfeffer		×
.. <i>wilsoni</i> , Schimkewitsch		×
.. <i>communis</i> , Bouvier	×	
.. <i>eureulio</i> , Bouvier	×	
<i>Tanystylum styligerum</i> , Miers		×
.. <i>dohrnii</i> , Pfeffer		×
.. <i>chierchiaë</i> , Schimkewitsch		×
* <i>Austrodeus glaciale</i>	×	
* <i>Austroraptus polaris</i>	×	
<i>Ascorhynchus glaber</i> , Hoek		×
* <i>Rhynchothorax anstralis</i>	×	
<i>Colossendeis gigas</i> , Hoek		×
.. <i>leptorhynchus</i> , Hoek		×
.. <i>gigas leptorhynchus</i> , Hoek		×
.. <i>megalonyx</i> , Hoek		×
.. <i>robusta</i> , Hoek		×
.. <i>gracilis</i> , Hoek		×
* .. <i>australis</i>	×	
* .. <i>glacialis</i>	×	
* .. <i>frigida</i>	×	
* .. <i>rugosa</i>	×	
<i>Decolopoda† australis</i> , Eights	×	
.. <i>antaretica</i> , Bouvier	×	

No less than seven expeditions have taken part in the recent "Siege of the South Pole," and the collections of Pycnogonids made by four of them still remain unpublished. This being the case, it is scarcely desirable to enter into a discussion on the geographical distribution of these animals. It may, however, be stated that the head-quarters of these animals appears to be in southern seas. Professor Möbius (22) has compiled a list of the known Arctic and sub-Arctic species, which number forty-two. In the same work, for comparison, he has added a list of all the species taken beyond 30° South latitude. Only thirty-one species are included in this large area, and the genus *Tanystylum* is the only one occurring in the south which does not occur in the north. I have reduced the Southern or Antarctic area to what I consider more reasonable dimensions, and the 'Discovery' collection, with its predecessors, raises the total to sixty-three species. Among these species there are five new genera; four of these are, as far as is yet known, confined exclusively to the Antarctic region, the other extends well into the sub-Antarctic region. The "Bipolarity Theory" is only affected by a single species, *Colossendeis australis*. Of all the numerous species of this genus, *C. proboscidea*, from the north, and *C. australis*, from the south, stand apart from all the rest on account of their bodily form, and there can be no question that they are much more nearly related to each other than

† [As Eights said his species had "five perfect pairs" of legs he doubtless meant to write *Decaholopoda*.—Ed.]